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Passage of Ovoglobulins Through the Shell Membrane.

EDMUND McNALLY. (Introduced by T. C. Byerly.)

From the Bureau of Animal Industry, U. S. Department of Agriculture.

It has been shown by Pearl and Curtis[1] that during the sojourn of the egg in the uterus the weight and nitrogen content of the albumen increases by the addition of a nitrogenous solution after the shell membrane has been formed. Data were collected to observe what kind of nitrogenous materials were added after the shell membrane was formed.

Mature eggs to be used as controls were obtained in the morning from hens just beginning to lay a clutch of eggs, so that it was likely that they would lay the next day. Four to 6 hours after the egg was laid the hens were sacrificed and the immature eggs removed from the uterus. At this time the eggs were found with the shell membrane formed. The mature egg of the morning and the later immature egg from the same hens were analyzed as pairs.

The eggs so obtained were separated into yolk, thick albumen and thin albumen. A screen, similar to that described by Holtz[2] and Almquist was used for the separation of the thick from the thin albumen. Thirteen pairs of eggs were separated in this manner. The results of the separation of the albumen and the yolk were found to confirm Pearl and Curtis in that only 60% of the albumen by weight, and 90% of the nitrogen in the albumen were present after the shell membrane was formed, and it was for the most part thick albumen.

TABLE I.
Average Weight of Parts of Eggs.

	Yolk	Albumen	
		Thick	Thin
	gm.	gm.	gm.
Mature eggs	17.67	20.13	13.69
Immature "	17.38	17.97	2.35

The albumens were diluted, the ovomucins were removed with the centrifuge, and the supernatant fluid was made up to volume with a small amount of sodium chloride or sodium sulfate present to prevent precipitation of the ovoglobulins. The ovoglobulins and the ovalbumins were separated by precipitation of the ovoglobulins with

[1] Pearl, R., and Curtis, M. R., *J. Exp. Zool.*, 1912, **12**, 99.

[2] Holtz, W. F., and Almquist, H. J., *Hilgardia*, 1931, **6**, 49.

1.5 M sodium sulfate by a technique similar to that of Howe[3] for blood serum proteins. Non-protein nitrogen was determined by using Alman's tannic acid reagent or 2.12 sodium sulfate for protein precipitation. The ovomucoid content was determined by heat coagulation of the other proteins in the presence of acetate buffer approximately pH 4.7 and 0.2 M sodium sulfate. No attempt was made to separate the ovoglobulins or ovalbumins. Nitrogen was determined by macro-Kjeldahl.

TABLE II.
Average Protein Distribution in Ten Eggs.

	Ovomucin N mg.	Ovoglobulin N mg.	Ovalbumin N mg.	Ovomucoid N mg.	Non-protein N mg.
Mature eggs	42.1*	45.38.	350.19	61.55	17.48
Immature eggs	40.4*	15.44	342.58	53.02	16.64

* Average of 5 eggs only.

The ovoglobulin fraction shows the only significant difference and in this case, in each of the 10 pairs, the mature egg contains the larger amount. The material added through the membrane is a dilute solution of ovoglobulin with perhaps the salts necessary to keep it dispersed. The passage of the ovoglobulin through the shell membrane shows a behavior similar, in some respects, to that noted by Howe[4] in the rapid passage of globulins into the blood stream of young animals.

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Immunological Specificity of Carbohydrates Derived from Staphylococci.*

L. A. JULIANELLE AND C. W. WIEGHARD.

From the Bacteriological Laboratories of the Oscar Johnson Institute, Washington University, School of Medicine, St. Louis.

During the course of studies concerning hypersensitiveness in patients with trachoma, it became necessary to determine the possibility of the existence of different immunological types among Staphylococci. Preliminary experiments undertaken with the agglutination reaction revealed that strains isolated from different sources and

[3] Howe, P. E., *J. Biol. Chem.*, 1921, **49**, 93.

[4] Howe, P. E., *J. Biol. Chem.*, 1921, **49**, 115.

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