

weight (100 mg. powder 2-3 times per week). Four series of animals have been treated over a period of several weeks.

In each case the skeletal growth of the rats receiving thyroid in addition to the A.P. extract was distinctly above that of the rats receiving the extract only. In 3, the weight increases were greater also. The graph shows the characteristic effect.

These results suggest that the resumption of growth in thyroid-ectomized animals with thyroid feeding may not be due solely to a stimulation of the hypophysis but to a synergistic action of the thyroid. It also suggests that greater effects in human pituitary dwarfs might be secured by the concurrent administration of thyroid.

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Relative Amount of Mucin in Thick and in Thin Egg White.

EDMUND MCNALLY. (Introduced by Paul E. Howe.)

*From the Poultry Physiology Laboratory, Bureau of Animal Industry,
U. S. Department of Agriculture, Beltsville, Md.*

The white of a hen's egg is readily separated into two portions, the thin white and the thick white. The yolk appears to be floating in thin white enclosed in a sac of thick white and this thick white is suspended in another (outer) layer of thin white.¹

Previous studies of egg white have not demonstrated the nature of the difference between thick and thin white. In studying the proteins of egg white we have found that the thick portion of the white contains a much higher proportion of a protein possessing the properties of mucin than the thin white. This protein is soluble in an excess of mineral acids, insoluble in an excess of acetic acid, has a low nitrogen content (12.9%), and has the general physical properties of mucin. Examination of the eggs of some other birds indicates that this unequal distribution of mucin is not confined to the egg of the hen. Table I shows the mucin content of the eggs of the hen, pigeon and duck.

The whites of the eggs were separated on a screen as described by Holst and Almquist.² The thin white separated by this method con-

¹ Almquist, H. J., and Lorenz, F. W., *Poultry Science*, 1933, **12**, 83.

² Holst, W. F., and Almquist, H. J., *Hilgardia*, 1931, **3**, 49.

TABLE I.

Source and character of egg white	No. samples	Mucin N in 100 gm. of sample Mg.	N in remainder of 100 gm. of sample Mg.	Total N in 100 gm. of sample Mg.
Hen egg	7			
Thick		94.5 ¹	1,518	1613.5
Thin		10.4 ²	1,566	1576.4
Pigeon egg	2			
Thick		192.4	1,403	1595.4
Thin		40.5	1,444	1484.5
Duck egg	2			
Thick		263.6	1,553	1816.6
Thin		46.5	1,566	1612.5

¹ Standard deviation \pm 28.65.

² Standard deviation \pm 4.01.

tains both the outer and inner thin whites.¹ Tests of the inner thin white indicate that it may contain only minute quantities of mucin. It is possible that in the formation of eggs the mucin secretion and the serous secretion are poured out together and that the mucin particles coalesce, holding a certain amount of thin white, and that the volume of thick white varies with the changes in hydrogen-ion concentration.

Various authors, when discussing the preparation of the proteins of eggs, refer to the fact that they have dissolved egg white in salt solution or in water. We have found great difficulty in obtaining a "solution" of egg white in which particles of undissolved mucin are not present. It is probable that the mucin is seldom, if ever, obtained in solution in the sense in which most proteins are considered to be in solution.

A large proportion of thick white is of considerable economic importance since the quality of an egg is judged, in part, on the amount of thick white it possesses, as indicated in the opened egg by the unbroken envelop of thick white enclosing the inner thin white and yolk. Carbon dioxide has been shown³ to have an effect in maintaining the quality of eggs, which probably depends largely upon the influence of the hydrogen-ion concentration on the physical properties of mucin. Mucin may likewise have a rôle in the regulation of the exchange of materials during incubation between the embryo and the several other parts of the egg and the surrounding atmosphere.

³ Sharp, P. F., and Powell, C. K., *Indus. and Engin. Chem.*, 1931, **23**, 196.