Guinea pig serum was now kept before an electric fan until the volume was reduced to about 1/10 by "pervaporation".[3] The gross change was obviously the removal of water. The complement titer of the serum thus highly concentrated was only about doubled.

Since pervaporation presumably made no change in the relation of the various protein fractions to each other and resulted in a relatively slight increase in complement titer while freezing and thawing caused a demonstrable change in those relations and was accompanied by a notable increase in titer it would appear that the increase in titer in the latter case was due to the changed relation of protein fractions, the demonstrated change being a relative increase of albumin and a relative decrease of globulin.

8309 P

Vacuolization During the Water Exchanges of Cells.

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In a study of the water exchanges of the eggs of the sea urchin, *Echinometra lucunter,* the appearance of vacuoles was noted during one phase of the swelling process. When single eggs of this species were observed while swelling in 60% sea water, 2 different equilibria were found during each of which the measurements of the egg diameters remained constant for a period of from 20 to 30 minutes. The first of these occurred after approximately 60 minutes' exposure to the experimental solution and the second after 120 minutes, the eggs now exhibiting a somewhat smaller volume. The shrinkage occurring between these 2 equilibria was accompanied by active vacuolization, the vacuoles appearing in the central portion of the egg and migrating to the cortical layer. Although the emptying of these vacuoles to the outside was not seen, it was inferred from the fact that no accumulation of vacuoles could be detected at the periphery even though additional vacuoles were continually migrating in that direction.

Just[1] raised the question whether the consideration of an egg as

[3] Farber, Lionel, *Science,* 1935, **82**, 158.

[1] Just, E. E., *Protoplasma,* 1930, **10**, 24.

a simple osmotic system as proposed by Lucké and McCutcheon[2] should not be modified in the light of the wide occurrence of vacuolization in the eggs of *Arbacia punctulata*. Tests of the capacity of the eggs of *Echinometra lucunter* to be fertilized and to develop when returned to normal sea water at different times during the swelling process showed that, after the end of the first equilibrium, the eggs no longer react normally. This would indicate that vacuolization only occurs in these eggs after they have been injured and that therefore the normal, uninjured eggs may be considered as simple osmotic systems.

No detailed study of this phase has yet been completed on the eggs of Echinometra so that at this time one cannot explain the mechanism behind this vacuolization. However, Heilbrunn,[3] from observations on vacuolization in the eggs of *Arbacia punctulata*, concluded that this phenomenon is an internal surface precipitation reaction. This is solely an explanation of the mechanism forming the vacuoles and does not explain the factors which are operating to initiate and limit the vacuolization.

A detailed report of these experiments together with non-solvent volume determinations on the eggs of *Echinometra lucunter* will be published in the Papers from the Department of Marine Biology of the Carnegie Institution of Washington.

8310 P

Nucleotide Nitrogen Content of Certain Tissues of the Dog and Rabbit.

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Recent investigations have attributed several properties to the nucleotides which occur in the tissues. The most important of these properties is the participation of adenosine triphosphate in the phosphorylation of the hexose arising from the hydrolysis of glycogen. This is a very necessary procedure in the anaerobic formation of the lactic acid of the muscle.[1] However, as is well known, all tissues

[2] Lucké, B., and McCutcheon, M., *Physiol. Rev.*, 1932, **12**, 68.

[3] Heilbrunn, L. V., *Protoplasma Monographien*, 1928, **1**, Chap. XIV.

[1] Lohmann, K., *Biochem. Z.*, 1931, **241**, 50.