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The Ionization of Adsorbed Protein.

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The electric mobility of freely dispersed egg albumin and of microscopic quartz particles covered with the same protein have been shown to be fairly similar between pH 3.2 and 5.5.[1] Zeta-potential measurements by the method of streaming potentials have confirmed this relationship.[2] The mobilities of quartz and other kinds of particles covered with egg albumin and with gelatin have since then been studied in the pH range noted in conjunction with the titration curves for these proteins. Under certain conditions, the change in mobility of the protein covered particles has been found to follow the titration curves of these proteins very closely. (Fig. 1.)

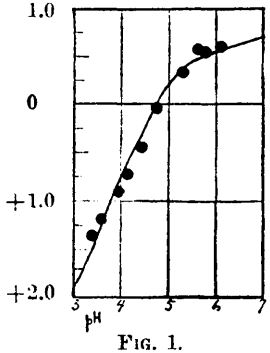

FIG. 1.

The smooth curve is the titration curve for salt-free gelatin taken from Simms.* (A slight change has been made in the ordinate notation.) The dots are values of cataphoretic mobility obtained with gelatin-coated (Licht-filter Agfa) quartz particles suspended in N/150 Na-Acetate at the pH's noted on the abscissa. The protein concentration was 0.2%. It should be noted that the agreement here is only to be had for these conditions. Ordinates are μ/sec./volt./cm. and equivalents of acid per unit quantity of protein.

All of these observations indicate that the process of adsorption of the proteins mentioned does not appreciably change the ionization of the adsorbed protein at the protein-water interface. The free amino and carboxyl groups of the protein are, therefore, not primarily involved in the quartz-protein combination. These facts lend a particular biologic importance to the rôle of protein activity at phase boun-

[1] Abramson, H. A., *J. Am. Chem. Soc.*, 1928, l, 390.

[2] Briggs, D. R., *J. Am. Chem. Soc.*, 1928, l, 2358.

* Simms, H. S., *J. Gen. Physiol.*, 1928, xi, 629.

daries. In this connection a striking example observed by Michaelis and by Nelson and Griffin[3] demonstrates how an enzyme, invertase, although adsorbed at an inert phase boundary, may still retain its complete activity.

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Differential Cell Count of the Peritoneal Fluid from the Normal Guinea Pig.

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In carrying out studies on the cellular reactions provoked in the guinea pigs' peritoneal cavity by the injection of tubercle bacilli, differential cell counts were made upon a series of peritoneal fluids previous to the inoculations. This has furnished such a large number of counts upon the normal peritoneal fluid that it has seemed worth while to collect and report the figures, particularly since there is no general uniformity in the results published by other writers.[1, 2, 3, 4, 5, 6] Peritoneal fluids from 237 apparently healthy guinea pigs have been examined, and as no effort was made to select a particular type of animal, this group probably represents a fair average of any laboratory stock. The observations have been carried on over a period of several years during both winter and summer months. Therefore any effects attributable to seasonal or dietary conditions may be assumed to have been comprehended. The majority of the animals were purchased from 4 different sources; a few were raised in the laboratory. They were of both sexes, of many colors, and they varied in age from a few days to several years.

Without previous injection of salt solution or other liquid, samples of peritoneal fluid were withdrawn through sterile capillary pipettes and supravital preparations with neutral red or neutral red-Janus green were made. Differential cell counts were done on 200

[3] Michaelis, L., *Z. f. physiol. Chemie.*, 1926, clii, 183; *Biochem. Z.*, 1921, cxv, 18. See also Nelson, J. M., and Griffin, E. G., *J. Am. Chem. Soc.*, 1916, xxxviii, 1109.

[1] Szecsi, St., and Ewald, O., *Folia Haematol.*, 1913, xvii, 167.

[2] Lucia, S. P., PROC. SOC. EXP. BIOL. AND MED., 1926, xxiv, 133.

[3] Manwaring and Bronfenbrenner, *J. Exp. Med.*, 1913, xviii, 601.

[4] Kamiya, H., *Beit. z. path. Anat. u. allg. Path.*, 1924, lxxii, 761.

[5] Briscoe, J. C., *Festschr. f. Orth.*, Berlin, 1903, 396.

[6] Cunningham, R. S., *Am. J. Physiol.*, 1922, lix, 1.