

69 controls 4 cases of prolongation occurred; 3 of them 8-day cycles and one a 13-day. Three of these 4 prolonged cycles were in cases which received nasal manipulation but no silver salt.

The findings establish the existence of a naso-genital relationship whereby nasal stimulation elicits an ovarian response, a diestrual prolongation. On the basis of luteal ovaries and decidual reactions in traumatized uteri, this prolongation must be considered pseudo-pregnancy.

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9417

Is Antibody-Globulin "Denatured" by Its Combination with Antigen?

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It has frequently been stated that antibody becomes "denatured" when combined with its antigenic or haptenic counterpart. "Denatured" is one of our slippery words which has a loose rather than a definitive signification. Perhaps "lessened solubility" most commonly expresses what is meant by denaturation. Shibley¹ has recorded the remarkably identical electrophoretic behavior of thermally denatured normal globulin and of bacteria thoroughly coated with antibody-globulin. But, that antibody-globulin has not really lost its natural (and very labile) qualities as a result of its combination with antigen, is shown by the facts that dissociated antibody retains its specific combining characteristics, and immune sera produced by injecting antibody-antigen complexes not only reflect the species-specificity of the serum,² but also the particular features of different kinds of antibody, *e. g.*, that of antipneumococcal serum is antigenically somewhat different from diphtheric antitoxin³—each having been combined with its antigen before injection into the antibody-producing animal.

To compare, in another way, the properties of specific globulin-antigen compounds and thermally denatured globulin we have mixed

¹ Shibley, G. S., *J. Exp. Med.*, 1929, **50**, 825.

² Braun, H., *Z. f. Immunitätsf.*, 1909, **3**, 53.

³ Ando, K., Kee, R., and Komiyama, T., *J. Immunol.*, 1937, **32**, 181.

an opalescent solution of the latter (normal rabbit's serum, diluted with 3 volumes of water, steamed for 15 minutes, and centrifuged) with specific precipitative systems (hemocyanin and ovalbumin) and have found that the amounts of precipitated nitrogen were no greater than those produced in mixtures not containing the heated normal serum whether in the zone of equivalence, of excessive antigen, or of excessive antibody. In these respective zones the comparative figures, averages from duplicate analyses, were 0.512 and 0.489; 0.517 and 0.509; 0.402 and 0.408 mg. N in the *Fulgur carica* hemocyanin-system; 0.103 and 0.110; 0.106 and 0.117; 0.172 and 0.181 mg. N in the *Limulus polyphemus*-system. Mixtures of ovalbumin and its antiserum (rabbit) were made only in the zone of equivalence and of excessive antibody. The nitrogens in the precipitates were 0.743 and 0.749; 0.498 and 0.502 mg.

Thus, the prominent cohesive property of specifically combined antibody-globulin is not developed by thermally denatured normal globulin, although, in Shibley's experiments, the ζ -potentials of the two forms were identical. This negative evidence is reported because it slightly narrows the field wherein we must search for an answer to the question: What makes combined antibody sticky?

9418 P

Occurrence of Birefringence in the Fertilized Egg of the Sea Urchin.

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In preliminary experiments it was observed that, after fertilization, the eggs of *Strongylocentrotus purpuratus* showed, near the periphery, light and dark phases when rotated between crossed Nicols. The effect, however, was partially masked by the opaque granules of the cytoplasm. In order to eliminate this difficulty the unfertilized ova were centrifuged at approximately 60,000 gravities for 3 minutes, flotation of the eggs being insured by the addition of sufficient M/1 solution of sucrose to the sea water in the tubes. After centrifugation the eggs were transferred to sea water and microscopic preparations made in the usual way. The eggs appeared elliptical in shape, with the nucleus at the centripetal end and the