

Minnesota Section

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8614 C

Precipitin Reactions with Bone and Teeth.

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It was suggested by Professor A. E. Jenks of this University that immunological reactions might be used to determine the origin of archæologic relics composed of bone or ivory. To test the feasibility of this project, the following experiment was undertaken.

A fox's skull was roughly cleaned of meat, and the brain was washed out. It was placed on a roof and exposed to the weather for 2 weeks. During this time it became covered with maggots which dried up and dropped off. The skull was then thoroughly scrubbed, rid of practically all adherent soft tissue. Nearly all the teeth dropped out during this operation, and the remainder were extracted. The skull and teeth were again exposed to the weather for 3 weeks, after which they were kept indoors for an additional 2 months.

Four rabbits were injected with fox-serum twice weekly for 12 weeks. The pooled serums precipitated with fox-serum in dilutions up to 1:500,000.

The skull was wrapped in a towel and crushed. The crushed bone was ground to a rather coarse powder, the largest particles being about 0.5 mm. in diameter. The teeth were ground separately. Both bone and teeth were then extracted with a volume of salt-solution slightly less than the volume of ground material, for 2 hours at room-temperature, shaken repeatedly, and kept over night in the ice-box. Precipitin-tests with these extracts were completely negative with the teeth, and very faintly positive with the bone, the reaction with the latter being about the same in degree as with fox-serum diluted 1:100,000.

This experiment indicates that the use of the precipitin-test in identifying archæologic relics, while not absolutely hopeless, is not very promising.

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Variation of *Micrococcus tetragenus*.

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Numerous recent studies suggest that the phenomenon of microbic dissociation or dissociative variation is exceedingly complex and involves more than the M, S, R, and G phases so extensively studied during the past decade. Evidence at present indicates that in addition to these so-called phase-transformations, another form of variation exists which involves even greater biologic differences. In studies on a strain of *Micrococcus tetragenus* obtained from a patient I have encountered more than 13 different forms and have isolated and studied 10 of the fairly stable ones.¹ They were named according to pigment-production, colonial morphology and cell-morphology as follows: mucoid-yellow, yellow, mucoid-white, white, mucoid-pink, pink, pink-yellow, brown, translucent, and a bacillary form. There was evidence of frequent change from one form to another and each of the forms except the bacillary one was related to the other directly or indirectly by antigenic similarity. In attempting to correlate the 10 different forms with the M, S, R, and G forms of other bacteria, difficulty was encountered in the fact that 3 mucoid forms existed in the same presumed dissociative pattern. Furthermore no true R forms had been noted during 18 months of observation. The recent appearance of distinctly rough, dry, crinkled, and adherent pink colonies among smooth pink ones when an 8-month-old-broth-culture of the latter form was plated, suggested the possibility that at least 2 kinds of bacterial variation exist. The white, yellow, pink, pink-yellow, and brown forms may represent distinct variants or may even be regarded as antigenically specific types analogous to those existing, for example, among pneumococci, whereas the mucoid-white, mucoid-yellow, mucoid-pink, and rough-pink forms may represent cultural phases of the respective types. The place of the translucent

¹ Reimann, H. A., *J. Bact.*, April, 1936 (In press).