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Changes in concentration of sea water and their influence upon regeneration.

By A. J. GOLDFARB.

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The regeneration under changed densities of sea water was observed under conditions that ensured the elimination or uniformity of associated factors such as size of medusæ, volume, surface and depth of solutions, extent of injury, level of amputation, temperature, crowding, aeration, etc. Furthermore, the dilute solutions were made with water containing a known quantity of sea salts, and the concentrated solutions were made by slow evaporation in the sun's heat, which corrected certain errors in previous experiments of this nature. The results were checked by repeated observations, plotted for intervals of 14, 24 and 30 days, after amputation of the arms of *Cassiopea xamanacha*.

These medusæ lived in solutions ranging from 40 to 153 per centum of the salts of sea water. They regenerated however in 50 to 133 per cent. solutions. The regeneration of normal arms and supernumerary arms was limited further to 75 to 105 per cent. solutions. Beyond these limits regeneration was atypic. Optimum regeneration occurred not in sea water but in sea water diluted 95 to 90 per cent. With increasing dilution the amount regenerated was diminished very slowly, with increasing concentration very rapidly. The subsequent examinations revealed the fact that in the sub-optimum solutions the arms regenerated absolutely and relatively faster than in any of the other solutions, correspondingly changing the character of the curve.

When the results were compared with those of Loeb it was found that both the hydroid *Endendrium* of Woods Hole, Mass., as well as *Cassiopea* of Dry Tortugas, Fla., differed radically from the classic experiments of Loeb on *Tubularia* of Naples, in respect to the range of solutions in which animals lived or regenerated, the optimum solutions, the normality of the regenerated parts and the character of the curve. It is altogether probable that Loeb's curve is limited to *Tubularia* of Naples and does not

represent the behavior of organisms to changes of density of sea water, and that the differences in the behavior of these three organisms can hardly be correlated with the differences in concentration of the sea water in which they normally live.

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Variations in the amount of transformed atoxyl (trypanotoxyl) produced by varying the strength of atoxyl incubated with blood.

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A 10 per cent. solution of atoxyl in blood incubated for 1 to 3 hours at 37° C. is more than 10 times as toxic for *Trypanosoma brucei* as a 1 per cent. solution in blood similarly incubated. To avoid misleading results due to the transforming action of red blood corpuscles upon unaltered atoxyl continuing after the dilutions are made, immediately after incubation all red blood corpuscles should be removed by centrifugalization from the fluid containing the transformed atoxyl.

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Some observations on bacteria of the duodenum.

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The duodenal tube was sterilized by boiling in water for ten minutes and the lower end was covered with a tightly-fitting gelatin capsule which had been soaked in alcohol for several days. The gelatin capsule was finally coated with shellac and dried. The tube was ordinarily given late at night and the sample of fluid aspirated on the following morning, usually without any food being taken in the interval. In a few cases the fluid was obtained an hour after giving an Ewald test meal.