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The development of pieces of diemyctylus embryos.

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In a series of experiments performed on pieces of embryos of the newt *Diemyctylus torosus* care was taken to eliminate all sources of infection. The jelly surrounding the embryos was washed in a solution of mercuric chloride and then in sterile distilled water and transferred to sterile Ringer's solution in which the embryos were liberated. The embryos were then cut by means of a sharp razor into pieces of various sizes which were kept in sterile Ringer's solution. Even relatively small pieces showed developmental changes, and pieces from the neck region sometimes developed outgrowths which very closely resembled the gill filaments of the normal larvæ. In embryos cut in two just behind the gill region the posterior part which was kept alive for some months underwent a course of development strikingly like that of the normal embryo. The outgrowth of the tail, the development of the transparent median tail fin or keel, the formation of pigment cells, and the differentiation of tissue cells in general occurred in a perfectly normal manner so far as could be observed. These pieces increased in size, doubtless through the absorption of water, and became relatively transparent as the yolk granules in the cells were assimilated. In nearly all of these pieces the heart was entirely absent. Correlated with this was a complete absence of peripheral blood vessels. In the controls these were well developed and blood could be seen rapidly streaming through them, but, although the pieces developed far beyond the stage at which these blood vessels normally appear, they showed at no time any trace of these peripheral vessels. Sections, however, showed that the aorta and some of the larger veins were more or less imperfectly developed.

In several cases the anterior limbs budded out and differentiated in a normal manner, showing all the digits completely formed; such larvæ would swim about in a lively manner when they were stimulated. In fact the posterior pieces of these embryos developed much beyond the stage at which normal larvæ begin to take food, but whether lack of food precluded them from developing farther cannot as yet be stated.

A definite circulatory system is not necessary for the development of legs, gill filaments, the growth of the tail or the differentiation of internal organs up to quite a late period of larval life. The absence of the thyroid, thymus and pituitary body seems to produce no marked changes up to the period in which the legs and gills are well developed.

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On "racemized" casein.¹

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The remarkable observation made by Dakin and Dudley² that "racemized" casein is not attacked by pepsin, trypsin, or erepsin, is apparently excreted unchanged when injected subcutaneously or given by mouth to a dog, and is unaffected by bacteria, would indicate that the chemical structure of casein had been decidedly altered during the process of "racemization." Dakin³ suggests that the process is a tautomeric change of the keto-enol type in the manner $> \text{CH}-\text{CO}-\text{NH}- \rightleftharpoons > \text{C}=\text{C}-\text{OH}-\text{NH}-$ and that in the case of "racemized" casein this change must be complete for all the groups in the protein molecule, otherwise a point of attack for enzymes would be afforded and a partial splitting might occur. If the ketol-enol conversion be complete, the apparent discrepancy pointed out by Kober that all racemic peptides are attacked by erepsin would not necessarily be a real one, since

¹ Aided by a grant from the George Williams Hooper Foundation for Medical Research.

² Dakin, H. D. and Dudley, H. W., *J. Biol. Chem.*, 1913, 15, 271.

³ Dakin, H. D., *J. Biol. Chem.*, 1912-1913, 13, 357.