XXXV. CATALASE ACTIVITY DURING THE DEVELOPMENT OF THE CHICK EMBRYO

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THE present note describes the changes in the catalase content of developing chicken embryos from the 4th to the 15th day inclusive.

The study of changes in enzyme content during development of embryo is of much interest in regard to the differentiation of metabolism. Edlbacher [1934] for instance observed a much greater concentration of arginase in young animals than in adult ones. The activity of the arginase of a chick embryo at different stages of development falls steeply from the beginning of development to the end. Edlbacher's suggestion is that arginase is concerned with a formation of arginine for the nucleoprotein of the nuclei.

Experimental methods

The chick embryo was extracted from the egg, soaked for 1 min. in distilled water and accurately weighed. The embryo was then ground with powdered sand and the product dissolved in sufficient water, to make the final strength of

Fig. 1.

Fig. 2.

extract the same in all cases, viz. 10 mg. embryonic tissue per 1 ml. solution. The extracts were now centrifuged and 10 ml. of the fluid brought into contact with 20 ml. of 0.1 % H_2O_2 . After 15 min., 5 ml. of the above were added to 5 ml. of 1 % KI and 3 ml. of 33 % H_2SO_4 . The liberated I_2 was determined by titration with $N/100 \text{ Na}_2\text{S}_2\text{O}_3$. The activity of the catalase is given by the difference between the quantity of the $\text{Na}_2\text{S}_2\text{O}_3$ employed in the control and in the experiment. The results are shown in Fig. 1. When the results are plotted logarithmically as in Fig. 2, a straight line is obtained.

If we compare our results with those of Warburg *et al.* [1924], upon the course of glycolysis during embryonic growth we find a certain relationship between the two curves. In the initial stages of the embryonic development we find on the one hand the highest values of glycolysis and on the other the lowest values of catalase activity. Towards the end of development the glycolysis decreases and the catalase rises. It is certain that the catalase does not represent the only enzyme of respiration, but it can be employed as an indicator of the changes taking place in respiratory characteristics during embryonic growth.

SUMMARY

Figures are given for the rise in catalase content during the development of the chick embryo. The activity of the catalase is inversely related to the anaerobic glycolysis of the chick embryo. High values of catalase correspond to low degrees of glycolysis and vice versa.

REFERENCES

- Edlbacher (1934). Rektoratsrede Basel.
Warburg, Posener & Negelein (1924). *Biochem. Z.* **152**, 309.