periods of the experiment, in preparations in which the concentration of acid was at first too great to allow an active migration of the cells; at a still later period the optimum of consistency is passed in this solution, the cells become still softer and degenerative processes predominate. Thus the optimum passes in the course of time from preparations in which the concentration of acid was relatively low to preparations which had originally a higher concentration of acid.

Whether in a specific case the outgrowth in acid surpasses in duration and ultimately also in intensity that in the control solutions, depends upon a number of variable factors, especially important among which is the original power of resistance of the tissue to injurious factors.

126 (2358)

Presence of toxic and insulin-like substances in oranges, grape fruit and lemons.

By N. F. FISHER and EARL B. McKINLEY (by invitation).

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During the past few months Winter and Smith,[1] Best and Scott,[2] Funk and Corbitt,[3] Collip,[4] Perry,[5] and Dubin and Corbitt[6] have reported the presence of a substance in yeast and in plants and vegetables, which causes a fall in blood sugar upon injection into normal rabbits. In view of these results the possible presence of this substance in various fruits suggested itself to us.

Various methods of extraction were used with oranges, grape fruit and lemons with the following results:

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[1] Winter, L. B., and Smith, W. J., *J. Physiol.*, 1922, lvii, 100.

[2] Best, C. H., and Scott, D. A., *J. Metabol. Research*, 1923, iii, 177.

[3] Funk, C., and Corbitt, H. B., PROC. SOC. EXP. BIOL. AND MED., 1923, xx, 422.

[4] Collip, J. B., *J. Biol. Chem.*, 1923, lvi, 513; 1923, lvii, 65.

[5] Thalhimer, W., and Perry, M. C., *J. Am. Med. Assoc.*, 1923, lxxx, 1614.

[6] Dubin, H. E., and Corbitt, H. B., PROC. SOC. EXP. BIOL. AND MED., 1923, xxi, 16.

1. In every case a blood sugar increasing and a blood sugar decreasing principle was clearly demonstrated.

2. The type of curve obtained was dependent upon the varying amounts of either substance present.

3. Predominance of the toxic fraction (blood sugar increasing substance) invariably produced a preliminary rise in the blood sugar which was followed by a fall below normal. The period of delay in the fall of blood sugar varied with the amount of the toxic substance present.

4. By methods of purification, which will be reported later, it is possible to separate to a very large degree the hypoglycemia-producing principle from the hyperglycemia-producing substance; at least by these methods the double effect described when both substances are present, can be eliminated and a continuous rise or fall of the blood sugar can be obtained.

5. The hypoglycemia-producing principle and the hyperglycemic substance are present in the juice, pulp and rind of the fruits we have examined.

6. The hypoglycemia-producing principle acts similar to insulin. No delayed action has been observed as described for "Glucokinin".

The above findings appear to be in agreement with those reported by Dubin and Corbitt for vegetable extracts. At present it is impossible to state whether the slightly delayed fall in blood sugar of normal rabbits is a qualitative or a quantitative phenomenon of the toxic fraction.

127 (2359)

The nature of human isohemagglutinogens.

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In a previous communication on the nature of specific hemolysins, one of us[1] has dealt on the complexity of erythrocytes as antigen and endeavored to demonstrate that the cell stroma is the

[1] Hadjopoulos, L. G., *Arch. Int. Med.*, 1921, xxvii, 441.