

|               |   |            |
|---------------|---|------------|
| WXLRXS = red  | ♀ | long wings |
| WSWXL = white | ♂ | " "        |
| WSWXS = "     | " | short "    |
| WSRXL = red   | " | long "     |
| WSRXS = "     | " | short "    |

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The converse cross, viz., short-winged, white males by long-winged, red females gives also in the second generation besides long-winged, red- or white-eyed, males and females, short-winged red- or white-eyed *males*.

Heterozygous white females (WXLWXS) by short-winged red males gives long-winged red females, short-winged red females, long-winged white males and short-winged white males.

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**The glycogenolytic strength of blood serum from the pancreatico-duodenal vein and from the femoral artery, and of lymph from the thoracic duct, as affected by stimulation of the great splanchnic nerve.**

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The distribution of diastatic ferment (glycogenase?) in the animal body would lead one to conclude that its site of production is in the pancreas. Thus:

1. Extracts of this gland possess a glycogenolytic activity which is enormously greater than that of extracts of any other gland, or of blood serum.

2. Blood serum contains the next largest amount of glycogenase.<sup>1</sup>

These considerations prompted us to see whether blood from the pancreatico-duodenal vein is stronger in glycogenase than blood from the femoral or carotid arteries. They were found to be the same. We have recently repeated the observations with the modification that some of the samples of blood were collected during

<sup>1</sup>Macleod & Pearce, *Amer. Jour. of Physiology*, 1910, xxv, p. 255; cf. also Wohlgemuth and Benzur, *Biochemische Zeitschrift*, 1909, xci, p. 460.

stimulation of the great splanchnic nerve. In these experiments we have also determined the glycogenase in lymph, collected from the thoracic duct. The experiments were conducted in the usual manner<sup>1</sup> and in most cases controls with 0.5 per cent. soluble starch were run. These gave similar results to those in which glycogen

| Experiment No. | Nature and Amount of Fluid Used. | Experimental Condition.           | Glycogen (Dextrose) in Incubation Flasks. |                   |              | Remarks.                                                                              |
|----------------|----------------------------------|-----------------------------------|-------------------------------------------|-------------------|--------------|---------------------------------------------------------------------------------------|
|                |                                  |                                   | At Start.                                 | After Incubation. | Disappeared. |                                                                                       |
| III.           | Fem. art.                        | Before stimulating gt spl. nerve. | 0.087                                     | —                 | —            | Incubated 3 (?) hrs. 1 c.c. serum. Starch test gave dextrines first with *.           |
|                | Do.                              | After 15 min. stim.               | "                                         | 0.014             | 0.073        |                                                                                       |
|                | Pan. duo. vein.                  | Before stim.                      | "                                         | 0.019             | 0.068        |                                                                                       |
|                | Do.*                             | After 15 min. stim.               | "                                         | 0.011             | 0.076        |                                                                                       |
|                | Lymph.                           | Before stim.                      | "                                         | 0.020             | 0.067        |                                                                                       |
| IV.            | Do.                              | After 15 min. stim.               | "                                         | 0.012             | 0.075        |                                                                                       |
|                | Fem. art.                        | Before stimulating gt spl. nerve. | 0.185                                     | 0.077             | 0.108        | Incubated 3 hours. 1 c.c. serum. Starch test gave dextrines in 60 min. with all.      |
|                | Do.                              | During 1 hour stim.               | "                                         | 0.077             | 0.108        |                                                                                       |
|                | Do.                              | 30 min. after stim. off.          | "                                         | 0.082             | 0.103        |                                                                                       |
|                | Pan. duo. vein.                  | Before stim.                      | "                                         | 0.082             | 0.103        |                                                                                       |
|                | Do.                              | During 1 hour stim.               | "                                         | 0.082             | 0.103        |                                                                                       |
| VI.            | Do.                              | 30 min. after stim. off.          | "                                         | 0.080             | 0.105        |                                                                                       |
|                | Fem. art.                        | Before stimulating gt spl. nerve. | 0.141                                     | 0.067             | 0.074        | Incubated 4½ hrs. 1 c.c. serum in each case. Starch test gave dextrines first with *. |
|                | Do.                              | During 30 min. stim.              | "                                         | 0.040             | 0.101        |                                                                                       |
|                | Do.                              | 45 min. after stim. off.          | "                                         | 0.062             | 0.079        |                                                                                       |
|                | Pan. duo. vein.                  | Before stimulating.               | "                                         | 0.060             | 0.081        |                                                                                       |
|                | Do.                              | During 30 min. stim.              | "                                         | 0.059             | 0.082        |                                                                                       |
| VIII.          | Do.                              | 45 min. after stim. off.          | "                                         | 0.051             | 0.090        | Incubated 1 hour. 1 c.c. serum. Starch test gave dextrines first with * * *.          |
|                | Lymph.                           | Before stim.                      | "                                         | 0.053             | 0.088        |                                                                                       |
|                | Do.*                             | During 30 min. stim.              | "                                         | 0.026             | 0.115        |                                                                                       |
|                | Do.                              | 45 min. after stim. off.          | "                                         | 0.040             | 0.101        |                                                                                       |
|                | Fem. art.*                       | Before stim.                      | 0.146                                     | 0.081             | 0.065        |                                                                                       |
| IX.            | *                                | During 20 min. stim.              | "                                         | 0.081             | 0.065        | Incubated ½ hr. 5 c.c. serum.                                                         |
|                | *                                | 80 min. after stim. off.          | "                                         | 0.070             | 0.076        |                                                                                       |
|                | Lymph.                           | Before stim.                      | "                                         | 0.095             | 0.051        |                                                                                       |
|                |                                  | During 20 min. stim.              | "                                         | 0.099             | 0.047        |                                                                                       |
|                |                                  | 60 min. after stim. off.          | "                                         | 0.101             | 0.045        |                                                                                       |
|                | Fem. art.                        | Before stim.                      | 0.140                                     | 0.065             | 0.075        |                                                                                       |
|                |                                  | During 80 min. stim.              | "                                         | 0.058             | 0.082        |                                                                                       |
|                |                                  | 60 min. after stim. off.          | "                                         | 0.047             | 0.093        |                                                                                       |
|                | Pan. duo. vein.                  | Before stim.                      | "                                         | —                 | —            |                                                                                       |
|                |                                  | During 80 min. stim.              | "                                         | 0.058             | 0.082        |                                                                                       |
|                |                                  | 60 min. after stim. off.          | "                                         | 0.060             | 0.080        |                                                                                       |

was employed. The incubation periods varied from 30 minutes to 4 hours and 30 minutes, and the amounts of serum or lymph varied

<sup>1</sup>Macleod & Pearce, *loc. cit.*

from 1 c.c. to 5 c.c. By thus varying the conditions, chances of error are greatly eliminated. Controls were run in all the experiments except in some of the estimations of experiments 3 and 8 in which there was not sufficient serum or lymph for this purpose. Table I gives the results of these experiments.

*Consideration of Results.*—In experiments IV and VIII there was no evidence of increase of glycogenase during stimulation of the splanchnic nerve. There was a slight increase in the ferment contained in the femoral blood after the stimulation in experiments VIII and IX, but, since this was 60–80 minutes after the stimulation had been removed, the increase cannot be due to the stimulation. In experiment III there was a slight increase both in the pancreatic vein and in the lymph immediately after the stimulation. In experiment VI there was an increase in the lymph and in the femoral artery blood during the stimulation. The only experiment, therefore, in which splanchnic stimulation certainly caused a rise in glycogenase was No. VI. The increase occurred primarily in the lymph and secondarily in the systemic blood. It fell off in both after the stimulation was removed. We are not in a position at present to determine whether this result is of any importance in the metabolism of carbohydrates in the animal body, but we do not believe that it has any relationship to the increased glycogenolysis which occurs in the liver as a result of stimulation of the splanchnic nerve. Did it have this relationship we should expect the increase in glycogenase to occur in the blood of the pancreatico-duodenal vein rather than in the lymph.