amount localized inside the nerve endings. But then the enzyme power remains constant. After 5 weeks the same value was obtained. The Q.Ch.E. falls from the normal 40-60 to 20-25. This latter value is still very high. It is difficult to explain such a high value by the presence of the remaining fibers and cell bodies. There is reason to assume that considerable fraction of this enzyme is concentrated around the endings of preganglionic fibers and persists there as in the case of striated muscle. Even a fraction of the persisting enzyme if localized at the synapses would be sufficient to split during the refractory period the amount of ACh liberated at this ganglion by stimulation of preganglionic fibers.

The main difference between neuro-muscular junctions and ganglionic synapses seems to be that in the latter a greater fraction of the enzyme is localized inside the nerve endings. The disparity may be related to the powerful end arborization of preganglionic fibers which is not paralleled by that of the motor nerve endings of guinea pigs. The increase of the Q.Ch.E. of preganglionic fibers from 5.0 to a several times higher value at the nerve endings in the ganglion may indicate that the enzyme is localized near surfaces.

11137 P

Effect of Urine from Gastrectomized and Duodenectomized Dogs on Gastric Secretion.

M. H. F. FRIEDMAN, H. C. SALTZSTEIN AND A. A. FARBMAN.*
(Introduced by T. L. Patterson.)

From the Department of Physiology, Wayne University College of Medicine, and Laboratories of Experimental Surgery, Harper Hospital, Detroit, Michigan.

Previously we reported that from the urine of normal individuals there can be extracted a substance which inhibits gastric secretion when administered intravenously[1, 2] but not when administered subcutaneously[2] in the same dose. Ivy and his coworkers[3] and Necheles[4]

* With the assistance of R. O. Recknagel and H. M. Podolsky.

1 Friedman, M. H. F., Recknagel, R. O., Sandweiss, D. J., and Patterson, T. L., PROC. SOC. EXP. BIOL. AND MED., 1939, **41**, 509.

2 Sandweiss, D. J., Saltzstein, H. C., and Farbman, A. A., Detroit Physiological Soc., March 3, 1938; A.M.A., San Francisco Meeting, June 17, 1938; also *Am. J. Digest. Dis.*, 1939, **6**, 6.

3 Gray, J. S., Wieczorowski, E., and Ivy, A. C., *Science*, 1939, **89**, 489.

4 Necheles, H., personal communication to Dr. D. J. Sandweiss, June 30, 1938; also Necheles, H., Hanke, M. E., and Fantl, E., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 618.

have also studied the inhibition of gastric secretion by extracts of normal urine. An investigation was undertaken to determine the source or the mechanism of the body which is responsible for the elaboration of the active secretory depressant principle found in the urine. The possibility that the secretory depressant is formed in the gastrointestinal tract and is concerned with the autoregulation of gastric secretion is obvious. That the substance may be enterogastrone excreted in the urine was the suggestion put forward by Ivy and coworkers.[3]

We reasoned that if the gastric secretory depressant is of gastric origin, this would be shown in a study of urine extracts prepared from patients with extensive inoperable carcinoma of the stomach or from patients with pernicious anemia. However, both types of urine extract inhibited gastric secretion just as did the normal urine extract.[5] Accordingly, we resorted to the preparation of urine extracts from duodenectomized and from gastrectomized dogs. The collection of urine from these dogs was begun 3-4 weeks after the operation. This long interval between the operation and collection of urine insured depletion of possible stores of the substance in the body as well as obviated the early depressing effects of the operation.

Method: The benzoic acid adsorption procedure of Katzman and Doisy[6] for obtaining the gonadotropic hormone in pregnancy urine (Antuitrin-S) was employed in preparing the human and canine urine extracts used in our study. Assays were made on vagotomized dogs under nembutal anesthesia. Gastric juice was obtained by fistula from the whole stomach, contamination by oesophageal and intestinal secretions being prevented by ligation of the oesophagus and pylorus. Gastric secretion was stimulated by hourly subcutaneous injections of histamine phosphate (0.1 mg per kilo per hour). Urine extracts were administered intravenously at the end of the second hour. Because dog's urine is more concentrated than human urine, the extracts were administered in terms of original volume of urine rather than weight of extract. Rectal temperatures were taken at intervals throughout the course of the experiment, since "urine preparations under certain conditions cause a rise in body temperature" as "they contain a pyrogen."[7]

Results. Extracts from both normal human and dog urine, given 2 hours after the initial hourly injection of histamine, inhibited

[5] Friedman, M. H. F., Sandweiss, D. J., Recknagel, R. O., and Patterson, T. L., *Anat. Record*, 1939, **75**, Sup., 53.

[6] Katzman, P. A., and Doisy, E. A., *J. Biol. Chem.*, 1932, **98**, 745.

[7] Ivy, A. C., personal communication, Oct. 31, 1939.

markedly the secretion of gastric juice. Inhibition commenced within 45 minutes and lasted for 3 or 4 hours. The percent inhibition during the 3-hour period following the administration of extract is shown in Table I. It is seen that the extracts of urine from duodenectomized and from gastrectomized dogs also inhibited secretion. The extracts were without effect on blood pressure and their inhibitory effects on gastric secretion were quite independent of the course of body (rectal) temperature.

TABLE I.

The inhibition of gastric secretion during the 3 hours following administration of urine extract is expressed as percent of the secretion in control experiments during the same period.

Nature of urine	No. of experiments	% inhibition
Control (no urine given)	9	0
Human, Normal	7	67.5
Dog, Normal	5	63.0
" Gastrectomized	7	45.9
" Duodenectomized	4	56.0
Human, Heat-inactivated	3	1.5

Conclusion. An extract can be prepared from the urine of normal dogs which inhibits gastric secretion. The inhibitory principle is still present in the urine after removal of either the stomach or duodenum.

11138

Hormonal Inhibition of Lactation.*

R. P. REECE, J. W. BARTLETT, I. L. HATHAWAY AND H. P. DAVIS.
(Introduced by C. W. Turner.)

From the Departments of Dairy Husbandry, New Jersey Agricultural Experiment Station and Nebraska Agricultural Experiment Station.

In a previous communication[1] it was reported that the daily injection of 100 r.u. of a gonadotropic principle during the first 5 days of the lactation period in the rat caused no inhibition of lactation. Larger dosages and dosages over a longer period of time re-

* Contribution from the Departments of Dairy Husbandry, Journal Series paper of the New Jersey Agricultural Experiment Station, and Nebraska Agricultural Experiment Station, Journal Series No. 256.

1 Hathaway, I. L., Davis, H. P., Reece, R. P., and Bartlett, J. W., PROC. SOC. EXP. BIOL. AND MED., 1939, **40**, 214.