TABLE 2

MEANS AND SIGMAS IN WECHSLER-BELLEVUE IQS FOR THE THREE TESTING PERIODS

| | Initial test | Initial treatment | First re-test | Second treatment | Second re-test |
|---|---|---|---|---|---|
| Experimental group A $N = 15$ | M = 81.53 σ = 12.25 | Glutamic acid | M = 79.13 σ = 11.48 | Placebo | M = 81.00 σ = 12.77 |
| Experimental group B $N = 13$ | M = 87.69 σ = 11.77 | Placebo | M = 84.77 σ = 13.37 | Glutamic acid | M = 87.69 σ = 13.79 |

All medication was dispensed by a centrally located pharmacy on a physician's (FEB) individual prescription. At this pharmacy, in order to preserve the confidential nature of the medication schedule, the bottles containing the pills were labeled *A* and *B*. Thus, the nurses and aides who actually dispensed the tablets to the patients did not need to know which patient was receiving the actual medication and which the placebo. The therapy schedule, therefore, was known only to the pharmacist and the experimenters, none of whom was involved in the testing.

After two months of this type of dosage, medication was halted and re-testing was begun. This consumed a period of 21 days; during this time no medication was administered. With testing completed, treatment procedure was again begun. Those patients previously receiving placebo tablets now received a daily 12-g dose of glutamic acid, and those previously on glutamic acid received an equal number of placebo tablets. After two months, medication was again halted and a second re-testing was done.

Table 2 summarizes the test results in chronological order.

The significance of the differences between the means of groups A and B was determined for the initial testing, the first re-testing, and the second re-testing. In addition, the significance of the differences between the means for initial testing and first re-testing and between the first and second re-testing was determined for each of the groups.

None of the changes approaches significance. All differences are within the error of the instrument. As a result, the following conclusions seem evident:

1. The use of glutamic acid to restore mental capacity does not work with chronic paretics of the ages tested.
2. Only two patients gained as much as 10 IQ points. One gained it on glutamic acid medication, and the other gained it on placebo medication.
3. There was no downward trend in the test scores as the date of the end of medication became more remote.

### References


1. ALBERT, K., HOCH, P., and WAELSCH, H. *J. Nerv. Mental Disease,* **104**, 263 (1946).
2. WOODS, R. *Borden's Rev. Nutrition Research,* **9**, (7), 1 (1948).
3. PRICE, J. C., WAELSCH, H., and PUTNAM, T. J. *J. Am. Med. Assoc.,* **122**, 1153 (1943).
4. WAELSCH, H. *Am. J. Mental Deficiency,* **52**, 305 (1948).
5. WEIL-MALHERBE, H. *Biochem. J.,* **30**, 665 (1936).
6. DU BOIS, P. H., MAYS, L. L., and LANDIS, C. *Psychiat. Quart.,* **8**, 699 (1934).
7. EPSTEIN, S. H., and SOLOMON, R. C. *Am. J. Psychiat.,* **95**, 1181 (1939).
8. WECHSLER, D. *Measurement of Adult Intelligence* (3rd ed.). Baltimore: Williams & Wilkins (1944).
9. WECHSLER, D. *The Wechsler-Bellevue Intelligence Scale. Form II Manual for Administering and Scoring the Test.* New York: Psychological Corp. (1946).
10. FISHER, R. A., and YATES, F. *Statistical Tables* (3rd ed.). New York: Hafner (1948).


## An Improved Apparatus for Measuring the Electrogastrogram[1]


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In order to record more detailed data of the electrogastrogram we have evolved an improved apparatus as a further development and refinement of that used in the report of one of us (ENG) in November 1942 (*1*).

The present apparatus consists of a Miller-Abbott tube containing an intragastric electrode of .01-gauge pure silver wire with a fused bead 1–2 mm in diameter at its gastric end. This bead is chloridized, and the system made watertight by sealing with polythene cement. The other lumen of the Miller-Abbott tube is fitted with a latex balloon and attached to a strain gauge. The arm electrode consists of a helix of .025-gauge silver wire, chloridized, and placed within a glass bell (Fig. 1).

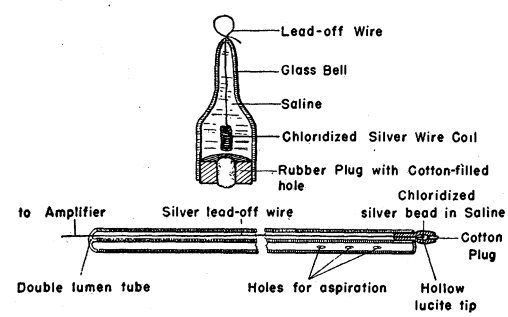


FIG. 1.


[1] This work was made possible by grants from Carola Rothschild, Sidney Rheinstein, and Mr. and Mrs. Robert Sherwood, through the Carola Rothschild Foundation.

The recording instrument consists of a G-E Photoelectric Potentiometer Model 8CE5 (Fig. 2). This instrument has a current consumption of .01 ma at balance position and a full-scale response time of 0.3–0.4 sec. It was found that our recorder would not operate with direct leads from our patients because the source impedance was high and there was insufficient dampening of the galvanometer. An impedance-changer in the form of a double triode amplifier operating with an input impedance of $10^7$ ohms is used. The amplifier is d-c–operated, is built in conjunction with a millivoltmeter, and has a gain of approximately 5.3. An additional advantage is the further reduction in current consumption imposed on the source of the potential being measured.[2]

The mechanical recordings are obtained with the aid of a pressure-operated strain gauge, the metal bellows of which is fed from the lumen of the Miller-Abbott tube leading from an intragastric balloon. The output of the strain gauge is, in turn, fed into a G-E Photoelectric Potentiometer Recorder identical with that used for the electrical recordings. Both the recorder from the electrical side and that from the mechanical side are synchronized so that the total electrical activity and total mechanical activity of the stomach are synchronously and continuously recorded (Fig. 2).

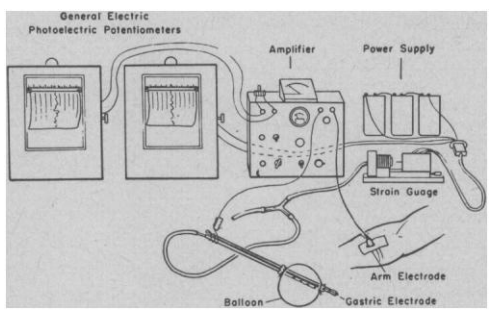


FIG. 2.

The above-described apparatus has the following advantages over that employed in the earlier work:

1. The recording instrument provides a continuous record instead of a connected series of spot-checks.
2. A full-scale deflection time of 0.3–0.4 sec instead of one of 28 sec.
3. The substitution of the stable silver-silver chloride electrode system for the calomel half-cell system.
4. The use of a long silver conductor instead of the liquid column conductors with their variable high resistance. This modification also dispenses with a large number of liquid interfaces.
5. The greatly lowered current consumption from the source being measured.
6. The inclusion of a method for accurately measuring synchronous variations in intragastric pressure.

Using the above apparatus we have recorded the electrical potential patterns from stomachs of normal subjects and of documented cases of duodenal and

[2] Purchased from H. S. Burr, Sterling Hall, New Haven, Conn.

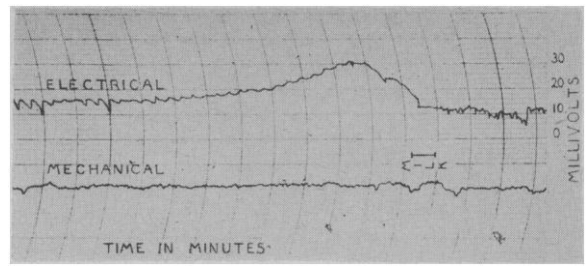


FIG. 3.

gastric ulcer, gastric carcinoma, and atrophic gastritis. Certain noteworthy facts are revealed regarding both normal gastric physiology and the electrical and mechanical behavior of diseased stomachs, which will be reported in detail in a subsequent paper.

Sixty-three determinations were performed on normal subjects. Fig. 3 show a typical pattern, with the upper line representing the electrical, and the lower line the mechanical, activity. The general characteristics of this group are:

*Electrical*: (1) A fairly regular baseline in rhythm, rate, and amplitude. The rhythm varies from 3–12/min with an amplitude of approximately 4–6 mv. (2) The milk response is immediate with increase in negativity, and dampening of amplitude.

*Mechanical*: (1) A fairly regular baseline corresponding to the electrical in rate, rhythm, and amplitude. (2) No appreciable change in baseline or amplitude with the ingestion of milk.

**Reference**

1. GOODMAN, E. N. *Surg. Gynecol. Obst.*, **75**, 583 (1942).

## False Absorption Bands in the Region of 200–230 mμ Caused by Stray Radiation in the Beckman Spectrophotometer

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Although most textbooks on spectrophotometry discuss errors caused by stray radiation, it is believed that the manifestations of these errors and their seriousness are not realized by many research workers in biology and chemistry, who are now using the Beckman Model DU spectrophotometer in the far ultraviolet region, where stray radiation is appreciable. Moreover, of those who are aware of the danger, many simply evade it by limiting their observations to the region above 220 mμ or by rejecting absorbancy[1] readings above a certain limit (*1*). Neither of these practices alone insures against false results, apart from the fact that the first practice may lead one to overlook important information, and the other may be inconvenient.

The effect of stray radiation in the region of 200–

[1] The terms are defined in *Natl. Bur. Standards Circ. (U. S.)* 484 (1949).