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## EMOTIONS AND GASTRIC FUNCTION<sup>1</sup>

By DR. HAROLD G. WOLFF

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REVIEWING the life histories of the patients with ulcers, Mittelman and Wolff found that the patients had been subject to prolonged emotional turmoil, involving mainly conflict, anxiety, guilt, hostility and resentment.

During periods of experimentally induced anxiety, hostility and resentment, they found a rise in acidity and increased contractions in the stomachs of all the patients suffering from ulcer and in many of the normal subjects. Moreover, they were able to reverse this process and cause a decrease in acidity and motility by inducing in their patients feelings of contentment and well-being.

In all the patients with peptic lesions it was possible to demonstrate a chronological parallelism between the onset, recrudescence and course of gastroduodenal symptoms, and the occurrence of untoward emotional reactions. The situations that prompted these reac-

tions were not necessarily dramatic or in the nature of crises, but, because of the existing emotional frame within which they occurred, they had important effects on the patients.

To demonstrate that the above-described emotional states were relevant to the gastroduodenal dysfunction and peptic ulcers in the particular patients studied, situations were experimentally created which induced destructive emotional reactions and precipitated symptoms when the patient was free of symptoms. Moreover, if such effects, symptoms and tissue defects already existed, all increased in intensity during such experimental procedures. On the other hand, in situations which engendered feelings of emotional security and assurance, gastric function was restored toward normal and symptoms eliminated, in those with symptoms and abnormal function.

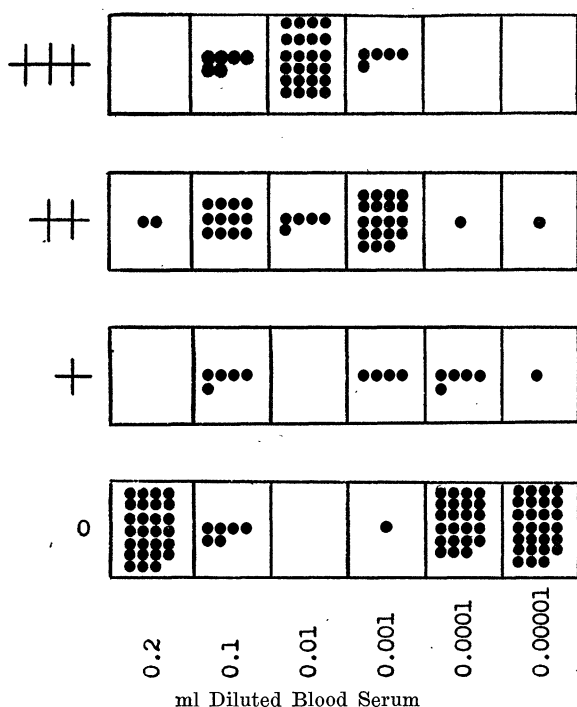
The facts of this study emphasize the occurrence in the same individual of the aforementioned destructive emotions coupled with increased motility and secretion

<sup>1</sup> Delivered at the New York Academy of Medicine Graduate Fortnight, October 11, 1943.

in support of the modified test does show that, when repeated at various intervals, changes occur which could be interpreted as indicative of increasing or decreasing dysfunction.

In the application of a similar procedure to routine studies, we studied a series of normal individuals, using the proposed fractional test.<sup>3</sup> It was noted that, whereas with 0.2 cc of undiluted blood serum a negative reaction would occur in nearly every instance, a positive reaction was noted when 0.1 cc of saline-diluted serum or less was employed (Fig. 1). This

FLOCCULATION AT VARIOUS DILUTIONS OF SERUM WITH SALINE



was particularly the case with greater dilutions of serum with saline, so that with 0.01 cc of diluted serum a definitely positive reaction usually occurred.

Accordingly, it is obvious that the fractional cephalin-cholesterol flocculation test by means of serial saline dilutions of blood serum is not a valid procedure for following alterations in hepatic function.

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<sup>2</sup> F. M. Hanger, *Jour. Clin. Invest.*, 18: 261, 1939.

<sup>3</sup> We are indebted to Dr. David Klein, The Wilson Company, for generous supplies of a standardized Cephalin-Cholesterol mixture.

## A TECHNIQUE FOR DIFFERENTIATING THE CELLS OF THE PITUITARY OF THE RAT

It is well known that procedures worked out for staining human tissues do not always give good results when used on animal tissues. In connection with some work done in this department it was necessary to devise a stain to differentiate the acidophils and basophils of the pituitary of the rat. Mallory connective tissue stain, using the procedure described in Mallory, "Pathological Technique," does not give satisfactory differentiation, but the adaptation here described, using somewhat different dye concentrations, different staining times and a different staining temperature, has given excellent results. The procedure is as follows:

**Fixation:** Fix in Helly's fluid and imbed in paraffin. Cut sections 4 micra in thickness.

**Staining:** (Note: Control each step under the microscope; all times given are average).

- (1) Stain approximately 5 minutes in a 0.1 per cent. (aqueous) solution of acid fuchsin.
- (2) Wash in water, then differentiate 1-2 minutes in water containing 8 drops glacial acetic acid per 100 cc.
- (3) Aniline blue stain
 

Aniline blue (w.s.)	0.5 gm
Orange G	1.3 "
Phosphotungstic acid 1 per cent. (aqueous) solution	100.0 cc

Stain at 35-40 degrees C for 10-15 minutes. Wash off excess stain in water.

- (4) Dehydrate quickly in 95 per cent. and absolute alcohols. Clear in xylol, mount in balsam.

MIRIAM REED

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## BOOKS RECEIVED

- BINING, ARTHUR CECIL. *The Rise of American Economic Life*. Illustrated. Pp. xii+732. Charles Scribner's Sons.
- BISHOP, SHERMAN C. *Handbook of Salamanders*. Illustrated. Pp. xiv+555. Comstock Publishing Company. \$5.00.
- BRELAND, OSMOND P. *Manual of Comparative Anatomy*. Pp. ix+250. McGraw-Hill Book Company. \$2.00.
- EPHRAIM, FRITZ. *A Text-Book of Inorganic Chemistry*. Fourth edition. Illustrated. Pp. xii+921. Gurney and Jackson. 28 net.
- MACBRIDE, J. FRANCIS. *Flora of Peru*. Pp. ii+507. Field Museum of Natural History. \$3.50.
- WOOD, ANDREW DICK and THOMAS GRAY LINN. *Plywoods. Their Development, Manufacture and Application*. Illustrated. Pp. xxi+373. The Chemical Publishing Co. \$4.00.

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This volume, just published, is based on extensive original information concerning stars, star clusters and distant external systems that resemble our own Milky Way Galaxy. The explorations described cover hundreds of millions of light-years in travel to spaces now reached by the greatest photographic telescopes. By Harlow Shapley. 126 Illus. 229 Pages. \$2.50 (1943)

#### **ATOMS, STARS AND NEBULAE—Goldberg and Aller**

In this volume, the reader gets a genuine thrill of discovery as he probes into the seething atmospheres of stars and digs into their interiors. There is a fascinating account of stellar rainbows, atoms, molecules, etc. By Leo Goldberg and Lawrence H. Aller. 150 Illus. 323 Pages. \$2.50 (1943)

#### **BETWEEN THE PLANETS—Watson**

This book summarizes our knowledge of comets, meteors, asteroids and meteorites, and gives a description of the latest discoveries. It also considers the multitude of vexing problems yet unexplained. By Fletcher G. Watson. 106 Illus. 222 Pages. \$2.50 (1941)

#### **EARTH, MOON AND PLANETS—Whipple**

This book carries the reader, in his imagination, below the clouds on Venus, Mars and the giant red planets into the depths of the earth and to the rough and airless surfaces on the Moon, Mercury and Pluto. A planet finder and star chart is included. By Fred L. Whipple. 140 Illus. 293 Pages. \$2.50 (1941)

#### **THE MILKY WAY—Bok and Bok**

The dust and gas in the vast spaces between the stars, the compositions and dimensions of star clusters, the appearance of our galaxy to an observer in the Andromeda nebula, and the problems of the past and future of our galaxy are discussed. Large scale photographic maps of the Milky Way, and portraits of leading scientists in the field are included. By Bart J. Bok and Priscilla F. Bok. 93 Illus. 204 Pages. \$2.50 (1941)

#### **THE STORY OF VARIABLE STARS—Campbell and Jacchia**

This book introduces the reader to the technique of observation and then proceeds to analyse the present state of our knowledge of variable stars. A list of brighter variables, a Julian calendar and other useful tables are included. By Leon Campbell and Luigi Jacchia. 82 Illus. 226 Pages. \$2.50 (1941)

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