

We feel that these results indicate that carnosine is a stimulant of isolated intestine and that it prevents the morphine relaxation effect on such tissues. Since morphine always increases the tone of the intact intestine, it may be that "carnosine lack" is the cause of the failure of such a response in isolated material. Studies to correlate the disappearance of carnosine with the effect of morphine on the isolated intestine are planned.

13232 P

Relation of Gastric Acidity to Alveolar Bone Resorption.

JULIUS BRECHNER AND W. D. ARMSTRONG.

From the Laboratory of Dental Research, University of Minnesota, Minneapolis, Minn.

The absorption of calcium occurs chiefly from the upper part of the small intestine, the reaction of whose contents has been shown¹ normally to be acid. Irving and Ferguson² found the absorption of calcium to be facilitated when solutions of calcium chloride, deposited directly in the intestine of dogs, were buffered so as to maintain an acid reaction. There is a direct relationship between pH of the intestinal contents and gastric free acidity³ and with advancing age there is a reduction in gastric acidity of both sexes.⁴ Clinical experience⁵ indicates that periclasia, one feature of which is alveolar bone resorption, is a condition which rarely occurs before age 20 but increases markedly in incidence after age 30. The coincidence of approximately equal age distributions of cases of physiological hypochlorhydria, periclasia and senile osteoporosis suggests that some cases of alveolar bone resorption are due to deficient calcium absorption consequent upon the secretion of an amount of hydrochloric acid by the stomach insufficient to maintain the normal acidity of the intestinal contents.

Seventy-nine individuals were subjected to gastric analyses, using

¹ Myers, F. J., and McClendon, J. F., *J. Biol. Chem.*, 1920, **41**, 187.

² Irving, L., and Ferguson, J., *PROC. SOC. EXP. BIOL. AND MED.*, 1924-25, **22**, 527.

³ Kearney, R. W., Comfort, M. W., and Osterberg, A. E., *J. Clin. Invest.*, 1941, **20**, 221.

⁴ Vanzant, F., Alvarez, W. D., Eusterman, G. B., and Dunn, H. L., *Arch. Int. Med.*, 1932, **49**, 345.

⁵ Brekhus, P. J., *J. Am. Dent. Assn.*, 1929, **16**, 2237.

50 cc of 7% alcohol as the test meal. The method of Bloomfield and Keefer⁶ was used for the gastric analyses, according to which, the entire stomach contents were aspirated and all of the contents returned to the stomach except for a 10 cc sample. This procedure was repeated each 10 minutes for one hour or until the stomach was empty. The samples were separately titrated and the results calculated so as to express the average contents of free and total acidity in terms of milliequivalents of hydrochloric acid per liter. In those cases exhibiting achlorhydria to alcohol stimulation the analysis was repeated with histamine stimulation. The procedure was repeated with three persons several weeks after the first gastric expression with the result that the average difference of the duplicate determinations of free hydrochloric acid from their mean was 3.9%.

Full mouth roentgenographic examination revealed that 42 individuals manifested alveolar bone resorption in varying degree and that 37 persons (control group) showed no evidence of alveolar bone resorption. The results of the gastric analyses are shown in Table I, where the figures in parenthesis indicate the extreme variation of the results entering into each mean. The standard deviation of the means of the pooled results for the males and females are shown as the lowermost number in each column. The ratios of the difference of comparable means to the standard error of the difference of the means were respectively: mean free acid 5.0, total acid 4.7,

TABLE I.
Relation of Free and Total Gastric Acidity to Alveolar Resorption.

No. of cases and sex	Age, avg	Mean free acid M. Eq./liter	Mean height of free acidity M. Eq./liter	Mean total acid M. Eq./liter
Control Group.				
16 M	28.6 (16-42)	32.5 (4.7-60.3)	46.0 (8.2-81.2)	46.0 (13.0-76.8)
21 F	27.0 (16-53)	23.6 (0.0-45.8)	35.9 (0.0-79.4)	38.4 (4.8-81.1)
37 M-F	27.0 (16-53)	27.4 (0.0-60.3)	40.2 (0.0-81.2)	41.7 (4.8-81.1)
Standard deviation of aggregate group		14.50	19.25	19.09
Alveolar Resorption Group.				
25 M	31.4 (21-43)	13.9 (0.0-59.3)	21.4 (0.0-79.6)	25.0 (3.6-78.5)
17 F	32.6 (19-51)	10.3 (0.0-23.8)	16.2 (0.0-42.0)	20.9 (3.0-38.5)
42 M-F	31.9 (19-51)	12.4 (0.0-59.3)	19.3 (0.0-79.6)	23.3 (3.0-78.6)
Standard deviation of aggregate group		11.52	17.30	15.03

⁶ Bloomfield, A. L., and Keefer, G. S., *J. A. M. A.*, 1927, **88**, 707.

and height of acidity 5.0. The probabilities of the higher values of the means of the control group resulting from chance is, therefore, remote. Too few cases were available for valid comparison of the means for men and women separately but the individual values of means in the control group exceeded those in the alveolar resorption group by 83 to 134%.

13233

Diurnal Rhythm of Melanophore Hormone Secretion in the *Anolis* Pituitary.

H. RAHN AND F. ROSENDALE. (Introduced by B. H. Willier.)

From the Department of Zoology, University of Wyoming, Laramie.

The *Anolis* lizard exhibits a striking color change by assuming a bright green color at night and usually turning a dark brown under the influence of light. This spectacular metachrosis is brought about by the concentration or dispersion of pigment in the melanophores which exposes or obscures respectively a green reflecting chromatophore layer and thus produces either a bright green or a dark brown animal. These dermal melanophores are directly controlled by the secretions of the pars intermedia of the pituitary gland (Kleinholz¹). The removal of this region or of the whole pituitary induces a permanent pigment concentration and consequently a green animal, while injections of melanophore hormone produce pigment dispersion and a dark brown animal. Thus hormone release and inhibition are easily recognized in a normal animal by its striking effect upon the integument color.

In preliminary experiments these lizards exposed to continuous light on a white background at 22° and 40°C for as long as 4 days exhibited a tendency to turn green during the corresponding night period and dark brown during the day. (*Anolis* lizards were obtained from Ocala, Florida.) This suggested a diurnal rhythm which was further tested by placing one group of 13 and another of 11 lizards in constant darkness for 8 and 18 days respectively. Throughout this period the temperature remained within a 22-24°C range. Observations were made twice to 4 times within the 24-hour day and were spaced at least 4 hours apart.

¹ Kleinholz, L. H., *Biol. Bull.*, 1935, **69**, 379; *J. Exp. Biol.*, 1938, **15**, 474.