possible that there are differences in the chemical purity of the dyes used in the two studies. However, it seems more likely that another interpretation is correct. Morrison, *et al.*, found the colloidal dye Congo Red in pouch fluids. This dye is used for plasma volume determinations because it leaves the blood stream very slowly. We suggest that it may have appeared in pouch secretions either in serous exudate or in blood, more probably the former. The finding of a colloidal component of the plasma is most plausibly accounted for on such an assumption. We repeated the experiment on 7 dogs with 2 samples of Congo Red of different origins in order to be quite certain of a failure of excretion. If the interpretation given above is correct, the finding of other non-colloidal acid dyes in pouch fluid by Morrison, *et al.*, loses its theoretical significance. Our failure to find any of these dyes in highly acid secretions confirms this view.

Summary. A list of acid dyes reported to be secreted in gastric juice has been reinvestigated. None of them appeared in histamine-excited gastric juice from Pavlov or Heidenhain pouches in dogs. This work gives support to the earlier generalization that only dyes in which the chromogen may be in the cation, appear in highly acid gastric secretions.

11973

Peptic Activity of Achlorhydric Human Gastric Juices from Carcinomatous Stomachs. Comparative Study.*

RICHARD A. RASMUSSEN AND ALEXANDER BRUNSCHWIG.

From the Department of Surgery and Medicine, the University of Chicago.

A comparative study of the peptic activity of human gastric juices was made as part of a general investigation in the problem of the physiology of the cancerous stomach. It has been stated that achlorhydric juices from such stomachs are weaker in peptic activity than juices containing normal concentrations of free HCl, and that in this respect they resemble achlorhydric juices in general. In the recent literature, at least, there is but little specific data upon this question. Polland and Bloomfield[1] recorded their observations upon

* This work was conducted under a grant from The International Cancer Research Foundation, Philadelphia, Pennsylvania.

1 Polland, W. S., and Bloomfield, A. L., *Bull. Johns Hopkins Hosp.*, 1930, **46**, 307.

5 patients with histamine achlorhydria and gastric cancer, noting the weak peptic activity as determined by the edestin method devised by them.

While very accurate methods for the estimation of peptic activity have been described,[2] the classical Mett's tubes were employed in this study because of simplicity and because significance was to be attached only to gross differences, which this method would detect. Glass tubes of uniform bore, measuring 1.0 mm in diameter were employed, and egg albumin was drawn into them by suction. They were placed in boiling water until coagulation of the protein was apparent. They were then filed into segments about 2 cm in length and stored in distilled water at room temperature.

All samples of gastric juice were obtained from empty stomachs after over night starvation by the usual histamine clinical test for gastric secretory function.

The tests were conducted as follows: Five cc of the juice to be tested was brought, if necessary, to pH 1.2 (thymol blue as indicator) and placed in a 30 cc pyrex beaker. Two Mett's tubes were placed in the solution which was then placed in an incubator at 37.5°C for 24 hours, under watchglass covers. Normal HCl was used to adjust pH, thus the volumes of the various samples tested were practically the same. To further insure uniform conditions the same 2 beakers were employed throughout the study.

The results were recorded in terms of millimeters of albumin digested at each end of the tube; since 2 tubes were placed in each sample, four readings were obtained in each test; the final figure recorded for the test was the average of the 4 readings.

The results are summarized in Table I.

It is seen that achlorhydric juices contain substantially less pepsin

TABLE I.

Source of juice	No. of different samples tested	Mm of Mett's tubes digested	Extreme Measurements in each series, mm
Patients with acid gastric juice presenting a variety of conditions	36	6.1	3 to 9
Carcinomatous stomachs secreting free acid	5	5.9	4 to 8
Pernicious anemia (achlorhydria)	9	1.3	0 to 4
Achlorhydria induced X-radiation to stomach	9	1.6	0 to 4.75
Achlorhydria without P.A., X-ray or gastric cancer	12	1.7	0 to 6
Achlorhydria with gastric cancer	9	1.4	0 to 2.75

[2] Gilman, A., and Cowgill, G. R., *J. Biol. Chem.*, 1930, **88**, 743.

than those containing free HCl. It is also demonstrated that in this series the low pepsin content of achlorhydric gastric juices from cancerous stomachs was of the same order as that observed in achlorhydric juices from other sources.

Conclusions. The low pepsin content of achlorhydric gastric juices from carcinomatous stomachs is of the same order as the low pepsin content of achlorhydric gastric juices obtained from patients not presenting carcinoma of the stomach.

11974

Soluble Antigen in Lymphogranuloma Venereum.

GEOFFREY RAKE, MORRIS F. SHAFFER, HELEN P. JONES AND CLARA M. MCKEE.

From the Squibb Institute for Medical Research, New Brunswick, N. J.

Neither the fundamental mechanism of the Frei reaction, which until recently was the only basis for the certain diagnosis of lymphogranuloma venereum, nor the nature of the reagent in the antigen which provokes a positive Frei test has yet been clearly defined. It has been observed that high-speed centrifugation of certain Frei antigens yields dermally active sediments containing virus elementary bodies[1] but nonreactive supernatant fluids.[1, 2] Furthermore, the passage of Frei antigens through Berkefeld filters[1, 2] or Seitz K discs[1] was found to reduce greatly or, more commonly, to abolish completely the dermal activity of the filtrate; it should be noted that Seitz K filters are permeable even to bacteria. These observations have led Findlay to the conclusion that the Frei test demonstrates an allergic reaction due to the presence of the elementary bodies of the virus in the material injected.

It has previously been shown that by propagation of the agent of lymphogranuloma venereum in the yolk-sac of the developing chicken embryo[3] or in the lungs of mice[4] there are obtained quantities of virus far greater than those present in other tissues. Inactivated suspen-

[1] Findlay, G. M., *Trans. Roy. Soc. Trop. Med. and Hyg.*, 1938, **31**, 587.

[2] Sullivan, M., and Ecker, E. E., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1024.

[3] Rake, G., McKee, C. M., and Shaffer, M. F., PROC. SOC. EXP. BIOL. AND MED., 1940, **43**, 332.

[4] Shaffer, M. F., Rake, G., and McKee, C. M., PROC. SOC. EXP. BIOL. AND MED., 1940, **44**, 408.