

produced by a similar method, previously reported. The cellular component apparently derived from the tubules and the interstitial cell mass in the testicular tumor, are indistinguishable from the granulosa cell and theca

cell components, respectively, of the ovarian tumor. In addition, certain portions of the testicular tumor are reminiscent of the structure seen in arrhenoblastoma.

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The Cause of Epidemic Diarrhea, Nausea and Vomiting. (Viral Dysentery?)

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Tests were made to discover if the disease called epidemic nausea, vomiting and diarrhea¹ or infectious gastroenteritis is (a) caused by a filtrable agent and (b) transmitted as an airborne disease; (c) if the portal of entry is the respiratory tract or the gastrointestinal tract and (d) whether the causative agent is present in the oropharynx, intestine, or blood.

The experiments were made on medical student volunteers under conditions not best suited to work of this kind. The students for obvious reasons could not be segregated, the number of test subjects was limited, and since the material obtained from patients with the disease was immediately filtered and given to volunteers, the experiments were made during a declining natural epidemic. The tests were begun about 3 weeks after the peak of the epidemic¹ had passed and while only 1 or 2 remnant attacks occurred daily or at intervals of days.

Broth garglings and suspensions of diarrheal stool samples were filtered through medium Mandler filters, nebulized and applied to volunteers usually within a period of 2 to 4 hours after their collection. Bacteria-free filtrates were nebulized in Wells flasks² with compressed air, and could be seen by transmitted light emerging from the flasks as a fine, almost imperceptible mist. The stream was

directed into a large pasteboard box into which the volunteer's head was placed for 5 minutes. Volunteers and the rest of the student body were then questioned at short intervals for 3 weeks for the development of symptoms.

Thirty-two volunteers in sets of about 8 on different days inhaled filtrates of garglings; of these 17 had attacks from 1 to 21 days afterward, mostly between 1 and 4 days. The symptoms reported were malaise, headache, abdominal discomfort, nausea, vomiting and diarrhea in varying combinations and in varying severity, mostly mild. In 7, mild nasopharyngitis occurred in addition.

Twenty-one volunteers inhaled stool filtrates and, of these, 11 developed similar symptoms in a similar period, 3 with mild nasopharyngitis also. No symptoms developed in 6 who inhaled nebulized serum.

Fifteen volunteers swallowed 3 cc of filtered garglings enclosed in double gelatin capsules, 5 swallowed stool filtrates, and 4 swallowed serum each similarly encapsulated. No significant symptoms developed in any.

In the remainder of the 240 students in the classes from which the volunteers were drawn, 22 attacks apparently of the declining epidemic disease occurred during the 4-week period while the experiments were in progress, as shown in Fig. 1. Some of these may have been contracted from ambulatory, sick volunteers.

Summary. Among the 32 volunteers who inhaled nebulized filtered garglings, symptoms developed in 17; of the 21 who inhaled nebu-

¹ Reimann, H. A., Hodges, J. H., and Price, A. H., *J. A. M. A.*, 1945, **127**, 1; Reimann, H. A., Price, A. H., and Hodges, J. H., *Proc. Soc. Exp. Biol. and Med.*, 1944, **55**, 233.

² Wells, W. F., to be published.

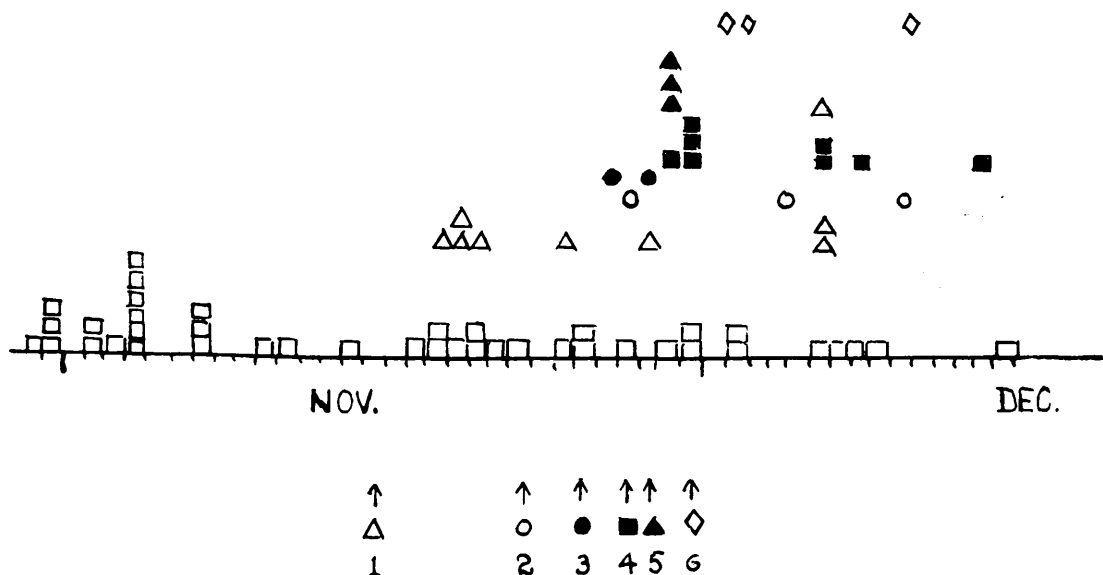


FIG. 1.

The natural epidemic among students compared with the number of induced attacks. The hollow squares represent natural attacks among 240 students in a declining epidemic: 22 attacks occurred after November 15 when the first experiment began. In the 6 experiments, 28 attacks among 53 volunteers are charted in various symbols. The 6 arrows and symbols indicate the date of exposure of volunteers to filtrates, and the corresponding symbols above indicate the day on which the respective attacks occurred.

lized stool filtrates, 11 developed symptoms. Of the combined groups of 53 volunteers, 28 (53%) developed symptoms as compared with 22 out of 240 (9%) of the rest of the student body in which the natural disease apparently occurred during the period of the tests. No attacks occurred in 6 volunteers who inhaled serum nor in 24 volunteers who were fed serum or filtrates of garglings or stools.

The results, considering the unideal circumstances during which the tests had to be made, suggest that the causative agent of the disease is filtrable, airborne, enters through the respiratory tract and is present in the oropharynx and stool but not in the blood. Tests are now being made in a nonepidemic period with material from the November epidemic preserved at -70°C .

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Methods for Determination of Thiamine in Blood and Tissues with Observations on Relative Contents.

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A number of methods have been proposed for the determination of thiamine in blood. Among these are the *Phycomyces* growth test

described by Rowlands and Wilkinson,¹ and by Meiklejohn,² the cocarboxylase method of

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¹ Rowlands, E. N., and Wilkinson, J. F., *Brit. Med. J.*, 1938, **2**, 878.

² Meiklejohn, A. P., *Biochem. J.*, 1937, **31**, 1441.