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An Institutional Outbreak of Food Poisoning Possibly Due to a *Streptococcus*.*

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Streptococci have been found in foods implicated in food poisoning outbreaks,^{1, 2} but the evidence that these organisms were the etiologic agent rests only upon animal feeding experiments.¹ In the outbreak here reported green hemolytic streptococci were isolated from the sausage epidemiologically implicated. Green hemolytic streptococci were also isolated from an unopened can of sausage from the same lot as that involved in the outbreak, and this sausage, when eaten by a human volunteer, produced symptoms of food poisoning.

The outbreak involved 75 out of 182 boys who had eaten a Sunday night meal at which Vienna sausage had been served. The other foods eaten by the boys could be ruled out on epidemiological grounds, and the water supply, from deep artesian wells, was not implicated. The sausages, taken from 6 large (No. 10) cans, were mixed in a container and served without heating. No abnormal appearance, odor or taste was noted. It seems probable, from the fact that less than half of the boys became ill, that the contents of only one or two of the cans were contaminated.

Nausea, vomiting, colicky pains and diarrhea developed in most cases in 4 or 5 hours, but several of the boys were not ill until 12 hours after the supper. All recovered within 24 hours of onset of symptoms.

Three sausages left over from the supper were examined in our laboratory. Two of these contained large numbers of slowly growing, green, pleomorphic streptococci. The organisms were killed by heating to 60°C. for one hour and to 85° for 15 minutes. No organisms of the *Salmonella* group were found when Endo and eosin methylene blue plates were streaked with the sausage. Four unopened cans of sausage with the same code marking were later examined. One of these contained viable organisms almost identical with those isolated from the 2 sausages of the outbreak. The un-

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¹ Linden, B. A., Turner, W. R., and Thom, Charles, *U. S. Pub. Health Rpts.*, 1926, **41**, 1647.

² Nelson, N. A., *New England J. Med.*, 1928, **109**, 1145.

opened can in which the contaminated sausages were found showed defective seams through which the organisms might have gained entrance.

When cultures from the unopened can had been incubated for 4 days, but before growth was evident, a young adult laboratory worker ate half a sausage from each of the 4 cans. Five hours later she developed nausea which increased for 24 hours with 2 periods of vomiting and epigastric pain. Marked exhaustion occurred, followed by constipation. A second volunteer drank 40 cc. of a Berkefeld filtrate of a 5-day beef-heart culture and became ill 5 hours later with belching; nausea appeared 24 hours later, accompanied by unsuccessful attempts at vomiting, intermittent epigastric pain, tenesmus, cold perspiration, a temperature of 99.2°F., and marked exhaustion. Neither of the 2 volunteers was ordinarily subject to gastro-intestinal upsets. From a cultural test of the filtrate drunk by the second volunteer it was estimated that 10,800 living streptococci were present in the amount of filtrate consumed. A third volunteer drank 50 cc. of a bacteria-free filtrate in which the organisms had been grown, and suffered no ill effects.

Mice, guinea pigs, rabbits and monkeys (*Macacus rhesus*) were fed cultures of these streptococci, but showed no definite symptoms. Three young cats that were fed 48-hour milk cultures of the organisms had soft stools the following day, the stools becoming normal and formed again on the second or third day.

The strains isolated from the sausages served at the school reduced litmus milk, causing soft coagulation with a red ring at the surface. Acid was produced in mannite broth. The strain isolated from the unopened can slightly reduced litmus milk, with no coagulation. No acid was produced in mannite broth. The strains were alike in that gelatin was not liquefied. Dextrose, saccharose, lactose, galactose and salicin were fermented with acid but no gas. Dulcitol, inulin and xylose were not fermented.

We feel that the illness of the 75 boys was possibly due to living pleomorphic streptococci in the sausage, and that similar organisms isolated from an unopened can of the same lot were capable of producing similar symptoms in human volunteers. The sterile filtrate apparently was incapable of producing illness.