

“TYPHOID FEVER IN ADEL”

December 23, 1914

“Dr. Bartlett of Iowa City, Mr. Jordan of Des Moines, both of the state board of health, and Professor Higgins, the state sanitary engineer, were here the latter part of the week and the first of this week looking for the cause of the typhoid outbreak here. Chemical and microscopic test and examinations are being made of all suspected substances to learn the origin of the disease.”

From the Archives, *Dallas County News*, December 18, 2014



## IPHA History

# Investigation of 1914 Typhoid Fever Outbreak in Adel, IA

By Dr. Ronald Eckoff

I read with interest the December 23, 1914 item in the archives section of the December 18, 2014 issue of the *Dallas County News*. This referenced the investigation of a typhoid fever outbreak in Adel being conducted by Mr. Jordan, Dr. Bartlett and Professor Higgins. The Eighteenth Biennial Report of the State Board of Health contains a complete report of that investigation. Gharrett Jordan was the assistant state chemist, Dr. C.L. Bartlett was the assistant bacteriologist of the state board of health laboratory (now the State Hygienic Laboratory) and Professor Lafayette Higgins, C.E., was the civil and sanitary engineer for the state board of health (a position established a year earlier). The local health officer, Dr. C. E. Mershon assisted in the investigation. I have omitted any other local names from the report.

“On November 5, 1914 a social was held under the auspices of the Ladies Aid Society. Forty-eight persons attended and partook of supper. A few days later a large proportion of those who attended were attacked by typhoid fever. The principal food served were creamed potatoes, cabbage slaw containing whipped cream, chicken sandwiches, which included cream in the preparation of the chicken, canned strawberries, cake and coffee. The creamed potatoes and chicken sandwiches were eaten by all present. Two children who did not eat the strawberries became ill. Two persons who did not eat the cabbage slaw became ill.

The persons who had anything to do with the handling of the milk or the preparation and serving of the supper were tested for the possibility of being typhoid carriers and were negative.

The water used in preparation and serving the supper was city water and examination of the water showed it to be safe. The cabbage and strawberries were both tested and were negative for typhoid bacilli. The creamed potatoes were cooked enough that any typhoid bacilli may have been destroyed. The chicken sandwiches were prepared as follows: The chicken was boiled

the day before, then placed in an earthenware vessel and covered. The day of the supper the broth of the chicken was made into gravy with cream with very little cooking. The chicken was picked apart into small pieces and mixed with the gravy for the sandwiches. The cream used in preparation of the chicken was from milk gathered the previous day, probably about 24 hours before the supper. The milk or cream was placed in the basement of the farm home where the temperature was moderately low. It was then brought to the town residence and kept cool until two hours before it was used in the preparation of the chicken. Then it was exposed to the temperature of the kitchen. Slow development could have occurred during the time it was kept cool, then rapid development would have occurred when subjected to the kitchen temperature. This would have been sufficient for the production of active virile bacilli.

If the milk/cream was the source of the typhoid, how did it get there? The farm well water was examined and had coliform bacteria indicating contamination, but no *Bacillus typhosus*. The farm that was the source of the milk was adjacent to the mill slough in Adel. The mill slough was an excellent fishing area. The farm owner was generous in allowing visitors to cross the farm to fish. They were also allowed to camp for several days at a time while fishing. It was estimated that several hundred fishermen may have visited the locality in a year. The entrance to the fishing ground was through the barnyard. “Taking into account the rather limited area of pastureland where the fishing parties would camp, the imperfect disposal of bodily waste in all such camp life, the frequenting of the barns and barnyards by members of such fishing parties, the amount of infection made possible in the surface wastes constantly accumulating under such conditions and the fact that the milch cows could readily receive such infection upon their bodies by contact, which infection could find its way into milk vessels at the time of milking, we have established the possibility for such infection.”

## IPHA History continued...

There was some further discussion in the biennial report, but it was the unanimous opinion of the investigators that this was the likely source of the typhoid infection.

The investigation of the typhoid outbreak was followed up with a sanitary survey of Adel. The city water was safe, but not available to all residents. There was a sewer system, but not throughout the whole town. Many outside toilets were still in use. Garbage disposal was much better than the average Iowa town, but still needed work in relation to stable wastes and kitchen wastes. The following is a summary of the recommendations from that survey:

1. Make the public water supply available to all residents.
2. Extend the sewer system to be available to all residents.
3. At the earliest date that financing can be arranged construct a sewage treatment plant.
4. When public water and sewer are available require that residents hook up.
5. Outside toilets be eliminated as rapidly as possible. Where necessary to continue their use, make them sanitary and fly proof.
6. Inspect streets and alleys at least twice a year to prevent nuisances.

It was finally stated these recommendations would apply to all Iowa towns.

The State Board of Health/State Health Department, State Laboratory and Local Board of Health/Local Health Department were important in protecting the public's health in 1914 and are important today.

## Additional Comment on Adel Typhoid Fever Episode, 1914

By **Russell W. Currier, DVM**

This episode very nicely reflects standards and measures to deal with food and waterborne disease in the early years of the 20<sup>th</sup> century. Thorough investigation eliminated intestinal carriers in people preparing and guests consuming food; likewise Adel municipal water was eliminated since other cases did not occur in the town nor were deficiencies noted in engineering and chlorination standards. Consequently milk became suspect since it was a food common to all ill attendees of the event. The connection of environmental contamination of dairy cows with human waste incidental to a popular fishing site in the pasture bordering the Raccoon River Mill Slough is most plausible. Also, in 1914 most, if not all milk, consumed in Iowa was not pasteurized; this fact coupled with the insufficient cooling or refrigeration of the milk and further recognizing that all milk produced at that time was hand-milked thus increasing the risk of environmental contamination, speaks to the milk as being the vehicle of transmission.

Milk pasteurization technology was developed on a commercial scale in the early 1890s and was promoted by academic pediatricians to reduce infant mortality. Alas many other physicians opposed it owing to [perceived] concerns of nutritional decrement from the heating or 'par-boiling' process in favor of complex infant formulas and even de-emphasis of breast feeding! By 1915, pasteurization's value to prevent disease and death was well accepted including Chicago and New York as well as several other municipalities mandating the process for retail milk. Nationwide pasteurization became the standard good practice for processing milk by the end of World War II. Of historical interest, the recognition of pasteurization's value followed a large milkborne typhoid fever outbreak in Washington DC in 1905 prompting President Theodore Roosevelt to commission a thorough investigation by federal officials culminating with a major report in 1909. At that very time, in addition to many physicians promoting pasteurization the chief lay proponent was Nathan Straus the co-proprietor of Macy's department store.