

**PHL 320
CRITICAL THINKING**

**DISTANCE DELIVERY
DR. JEFF JOHNSON**

Quiz Three

The article below comes from the *New York Times*, March 31, 2014. You need to use all four steps in the IBE recipe to justify your assessment of the quality of the evidence presented in the article for establishing that William Henry Harrison died of enteric fever.

1. Schematize the argument
2. State two rival explanations
3. Rank order the alternative explanations (the original and the two rivals)
4. Based on this rank ordering, justify your assessment of the quality of the evidence

What Really Killed William Henry Harrison?

By JANE McHUGH and PHILIP A. MACKOWIAK MARCH 31, 2014

William Henry Harrison, the ninth president of the United States, holds a distinction that with luck will never be equaled: He was our shortest-serving president, dying on April 4, 1841, after just a month in office.

What killed him? Historians have long accepted the diagnosis of Harrison's doctor, Thomas Miller: "pneumonia of the lower lobe of the right lung, complicated by congestion of the liver."

The pneumonia was thought to be a direct result of a cold the 68-year-old Harrison caught while delivering a numbingly long Inaugural Address (at 8,445 words, the longest in history) in wet, freezing weather without a hat, overcoat or gloves.

But a new look at the evidence through the lens of modern epidemiology makes it far more likely that the real killer lurked elsewhere — in a fetid marsh not far from the White House.

The first clue that the pneumonia diagnosis was wrong lies in Miller's own apparent uneasiness with it. "The disease," he wrote, "was not viewed as a case of pure pneumonia; but as this was the most palpable affection, the term pneumonia afforded a succinct

and intelligible answer to the innumerable questions as to the nature of the attack.”

Harrison — who had had some medical training as a young man — summoned Miller to the White House on March 26, complaining not of a lung ailment but of anxiety and fatigue. Miller did not bleed him, as was the standard treatment for pneumonia at the time. (More about what he did do in a moment.) But Miller may have overlooked a clue that was in front of his nose.

In those days the nation’s capital had no sewer system. Until 1850, some sewage simply flowed onto public grounds a short distance from the White House, where it stagnated and formed a marsh; the White House water supply was just seven blocks downstream of a depository for “night soil,” hauled there each day at government expense.

That field of human excrement would have been a breeding ground for two deadly bacteria, *Salmonella typhi* and *S. paratyphi*, the causes of typhoid and paratyphoid fever — also known as enteric fever, for their devastating effect on the gastrointestinal system.

Two other antebellum presidents, James K. Polk and Zachary Taylor, developed severe gastroenteritis while living in the White House. Taylor died, while Polk recovered, only to be killed by what is thought to have been cholera a mere three months after leaving office.

Harrison had a history of dyspepsia, or indigestion, which potentially heightened his risk of

infection by gastrointestinal pathogens that might have found their way into the White House water supply.

Although we have no record of how he managed his dyspepsia, the standard treatment in the 1840s was carbonated alkali, which would have neutralized the gastric acid that otherwise kills harmful bacteria. In the absence of the gastric acid barrier, gastroenteritis can be caused by as few as one ten-thousandth the number of bacteria usually needed.

In 1841 there was no effective treatment for enteric fever. The most a doctor could do was adhere steadfastly to medicine's most sacred tenet, *primum non nocere* — first do no harm.

At least Miller did not bleed the president. But he gave him a host of toxic medications that were then considered the standard of care — including opium, which retards the intestine's ability to rid itself of microbial pathogens, facilitating their invasion into the bloodstream.

Enemas, which Miller repeatedly gave to Harrison, are also potentially dangerous in such patients. They can perforate ulcers produced by *S. typhi* and *S. paratyphi* in the ileum, the lower end of the small intestine, through which the bacteria would be able to escape from the intestine into the bloodstream, resulting in sepsis.

As he lay dying, Harrison had a sinking pulse and cold, blue extremities, two classic manifestations of septic shock. Given the character and course of his fatal illness, his untimely death is best explained by

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enteric fever. Pneumonia was a secondary diagnosis — as Harrison’s hapless doctor perhaps suspected all along.

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