

***Radium Girls* by Kate Moore**

1. *The Radium Girls* is filled with both triumph and tragedy. Which part of the story affected you the most, and why?
2. Is there a figure in *The Radium Girls* that resonates more strongly with you than others? If so, what part of their story or character stood out?
3. Even after radium was proved poisonous, and the illness verified as work-related, the radium companies stood fast by their convictions. Why do you believe they were so resilient, and can you imagine modern companies behaving with such similar ruthlessness?
4. How do you believe the radium companies, and the press, would have reacted differently to the scandal had the workers been male? Considering the time period, how did their gender help and hinder their case?
5. How do you think today's world would be different had *The Radium Girls* not fought back against the radium companies?
6. It takes over 1,500 years for the effects of radium to wear off. This means that the bodies of the women and parts of the towns in which they worked remain poisonous to this day. Despite the harrowing implications, why do you feel this story hasn't been widely explored?
7. *The Radium Girls* is told mostly through the eyes of the radium-dial workers, their families, and friends; however, previous research never focused on their personal journeys. How did it change your appreciation of or engagement with the story to know the smaller, personal details of the girls' lives? Is there another historical event where you've noticed women being pushed to the sidelines?
8. Although radium can be seen as an evil entity in the book, it's also been used for the greater good. Explore how radium has changed the world in a positive way. Do you feel it was worth the sacrifice?
9. Besides radium, what other world-altering discoveries can you think of that both led to advancement, and also tragedy?
10. How were you inspired by the strength of the "shining girls", and how can you carry that onwards to incite change in your own life?
11. Trace the emotional trajectory of the women who worked with radium paint—from their initial excitement about their jobs to their realization that it was killing them.
12. What do you find most horrifying about the suffering the women endured as their health deteriorated? Was this too difficult to read? Or did you get through it?
13. Talk about the response of the United States Radium Corporation to the women's complaints—how much did it truly understand about the hazards of radium? What arguments did the company enlist against the health claims of the women?
14. What most outraged you about the treatment the women received? The dentist who approached the company for hush money, for instance? What else?
15. To what extent do today's laws offer workers protection against hazardous materials and other dangers in the workplace? Consider OSHA, for instance. How far have we come? What relevance does this story have in the 21st century?

The high demand for radium is at the heart of Kate Moore's book, *The Radium Girls*.

Radium is a naturally occurring element, most of which is found in uranium ore; it makes up approximately 1 part per trillion of the Earth's crust, making it our planet's 84th most common component. One ton of uranium ore can contain as little as 0.14 grams of radium. We're constantly exposed to this highly toxic metal, but in very minute amounts.

The element was discovered by Pierre and Marie Curie in December 1898. While working to separate uranium from a mineral called pitchblende, Marie discovered that the material remaining after the uranium was removed was actually more radioactive than the chemical they originally sought. After refining tons of pitchblende (now known as uranite), Curie narrowed down the source of the radiation to two previously unknown elements: polonium and radium. Curie further discovered that radium – a soft, shiny, silvery metal - was about 3 million times more radioactive than uranium. The radium sample, which was identified as a new element, emitted a faint blue glow in the dark.

Radium's dangerous nature was a concern very soon after its discovery. French physicist Henri Becquerel (who shared the 1903 Nobel Prize in Physics with the Curies), carried a small vial of the substance in his waistcoat for just six hours before finding the skin beneath the material had ulcerated. After handling radium, many other scientists suffered burns that would not heal.

Nevertheless, some experiments with radium led doctors to believe the substance was not only safe but beneficial. Although it was shown that radium leached into human bone as early as 1914, it was thought that it stimulated bone marrow to produce more red blood cells – an obvious health benefit. With that information, manufacturers started to put radium in everything from tonics to toothpastes to cosmetics to children's toys. Fortunately, although a number of products said they contained radium, it was very expensive to produce. Consequently, anything that truly contained radium only included small amounts and were sold to a very exclusive clientele. As [NPR put it](#): "Radium was the latest miracle substance — an element that glowed and fizzed, which salesmen promised could extend people's lives, pump up their sex drive and make women more beautiful. Doctors used it to treat everything from colds to cancer."

What scientists and doctors didn't realize at the time was that the increase in red blood cells was because radium degraded the marrow and mutated bone cells. The end result was that bones that absorbed radium, disintegrated causing necrosis of the bone and eventually, death.

Radium-226 has a half-life of approximately 1600 years, which means anything exposed to large amounts of radium can remain radioactive for a very long time. Eben Byers (1880-1932), who created and sold an "energy drink" that contained it, died from radium-induced cancer and was buried in a lead-lined coffin. When his body was exhumed in 1965, his bones were found to contain almost as much radium as they would have on the day he died. The lab notebooks used by the Curies are too contaminated to be safely handled to this day. After the "Radium Girls" won lawsuits against their employers for exposing them to a known health risk, use of radium to create read-in-the-dark devices waned, although radioactive rays from radium are easily blocked by glass or metal, so the material is safe if precautions are taken.

Radium's use has recently seen a revival as a treatment for cancer; in 2013 the U.S. Food and Drug Administration approved radium-223, a different version from the radium-226 that plagued the radium girls, for use in patients with advanced prostate cancer that has metastasized to the bone, since modern technology can concentrate radium in a specific area, thereby targeting cancerous bone cells.