

*The*  
**RADIUM  
GIRLS**

**THE DARK STORY  
OF AMERICA'S  
SHINING WOMEN**

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 sourcebooks

# PROLOGUE

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—1901—

THE SCIENTIST HAD FORGOTTEN ALL ABOUT THE RADIUM.

It was tucked discreetly within the folds of his waistcoat pocket, enclosed in a slim glass tube in such a small quantity that he could not feel its weight. He had a lecture to deliver in London, England, and the vial of radium stayed within that shadowy pocket for the entirety of his journey across the sea.

He was one of the few people in the world to possess it.

Discovered by Marie and Pierre Curie late in December 1898, radium was so difficult to extract from its source that there were only a few grams available anywhere in the world. He was fortunate indeed to have been given a tiny quantity by the Curies to use in his lectures, for they barely had enough themselves to continue experiments.

Yet this constraint did not affect the Curies' progress. Every day they discovered something new about their element: "it made an impression on photographic plates through black paper," the Curies' daughter later wrote, "[I]t corroded and, little by little, reduced to powder the paper or the cotton wool in which it was wrapped...What could it *not* do?" Marie called it "my beautiful radium"—and it truly was. Deep in the dark pocket of the scientist, the radium broke the gloom with an unending, eerie glow.

"These gleamings," Marie wrote of its luminous effect, "seemed suspended in the darkness [and] stirred us with ever-new emotion and enchantment."

Enchantment... It implies a kind of sorcery, almost supernatural power. No wonder the U.S. surgeon general said of radium that "it reminds one of a mythological super-being." An English physician would call its enormous radioactivity "the unknown god."

Gods can be kind. Loving. Benevolent. Yet as the playwright George Bernard Shaw once wrote, "The gods of old are constantly demanding human sacrifices." Enchantment—in the tales of the past, and present—can also mean a curse.

And so, although the scientist had forgotten about the radium, the radium had not forgotten him. As he traveled to that foreign shore, through every second of his journey, the radium shot out its powerful rays toward his pale, soft skin. Days later, he would peer in confusion at the red mark blooming mysteriously on his stomach. It looked like a burn, but he had no memory of coming near any flame that could produce such an effect. Hour by hour, it grew more painful. It didn't get bigger, but it seemed, somehow, to get deeper, as though his body was still exposed to the source of the wound and the flame was burning him still. It blistered into an agonizing flesh burn that grew in intensity until the pain made him suck in his breath sharply and rack his brains for what on earth could have inflicted such damage without his being aware.

And it was then that he remembered the radium.

## PART ONE



# KNOWLEDGE

## POSTSCRIPT

"WE GIRLS," SAID ONE WORKER, "WOULD SIT AROUND BIG tables, laughing and talking and painting. It was fun to work there."

"I felt lucky to have a job there," revealed another girl. "The job paid top dollar for women in this area. All of us got along real good."

"We slapped the radium around like cake frosting."

The women wore smocks, washed once a week amidst the family laundry. They drank open cans of soda through their shifts, sourced from the machine in their studio. They worked with bare hands and painted their fingernails with the material "for kicks"; they were allowed to take radium home to practice painting.

There was radium everywhere in the plant—and outside on the sidewalk. Contaminated rags piled up in the workrooms or were burned outside in the yard; radioactive waste was emptied into the toilet of the men's washroom; ventilation shafts discharged above a nearby children's play area. The women didn't clean their shoes before they left work, so they walked the radium all over town. Employees recalled that you couldn't work in the plant without getting covered with the stuff. "I'd come home from work at night and look in the mirror and see little specks of it glowing in my hair," recalled one dial-painter.

The women's hands would bleed as they tried to scrub away the supernatural shine.

"The company," said one girl, "always led us to believe every- thing was under control and safe, but I don't think they cared."

She was right. Before too long, the workers started suffer- ing. "I had to have a mouth operation," said one, "but now my teeth are so loosened that they are probably all going to fall out... I have a blood disease I can't seem to get rid of." The women noticed tumors appearing on their feet, their breasts, their legs. One woman recalled that the doctors kept cutting off parts of her colleague's leg, bit by bit by bit... until finally there was nothing more left to amputate. Ruth, the colleague, eventually died.

The women went to their supervisor, worried sick. "A man from the New York headquarters came out here," a radium girl remembered, "and told us [our work] wouldn't hurt us."

"Breast cancer," said the executive, "is thought to be a hormonal problem, not a radioactivity hazard."

But he was mistaken. A national cancer-institute specialist observed that the link between breast cancer and radiation was one of the best-established relationships around.

The executive continued to bluster: "The plant manager isn't entirely to blame. Employees are responsible for safety too."

But there were no warning signs in the workrooms. The women had been told that, as long as they didn't lip-point, they would be perfectly safe.

These women worked in a little town called Ottawa, Illinois. These women worked for Joseph Kelly's firm, Luminous Processes.

The year was 1978.

The original radium girls were indeed Cassandra-like in their powers; and just like Cassandra, their prophecies were not always listened to. Safety standards only keep you safe if the companies you work for use them. Concerns had been raised about the Ottawa plant for decades, but it wasn't until February 17, 1978, that the



dangerous studio was finally shut down: inspectors found radiation levels were 1,666 times higher than was safe. The abandoned building became something of a bogeyman for Ottawa residents, who became afraid to walk or even drive past it; it was graffitied with the slogan: DIAL LUMINOUS FOR DEATH.

"A lot of us are dead," one LP dial-painter stated bluntly. Of a hundred workers she mentioned, sixty-five had died; the cancer rate was twice as high as normal.

Yet Luminous Processes was unapologetic. It wriggled out of paying cleanup costs, contributing approximately \$62,000 (\$147,500) to the multimillion-dollar bill, while executives used "doubletalk" to put off the women when they demanded answers. Workers were offered just \$100 (\$363) in severance pay and had difficulty suing the firm. "They didn't have any respect for the health of the girls," one LP worker spat. "They were just interested in getting the work out."

"Luminous Processes," declared the local paper, "seems to put profits before people."

How quickly we forget.

## AUTHOR'S NOTE

I FIRST DISCOVERED THE STORY OF THE RADIUM GIRLS when I directed Melanie Marnich's beautiful play about the Ottawa women, *These Shining Lives*, in the spring of 2015 in London. It is a show that is rarely performed in the UK, but I randomly found it by googling "great plays for women." And while I may have been British and living more than four thousand miles from the town at the center of the script, the instant I read Catherine Donohue's opening monologue, I knew it was a story I needed to tell. This incredible piece of history, showcasing real women standing up for their rights with strength, dignity, and courage, was universal in its power and resonated with me hugely.

I firmly believe that when you're entrusted to tell someone else's true story—whether as an author, actor, or director—you have a responsibility: *to do justice to those whose story it is*. That's how I approached the true tale of the radium girls from the very first moment I discovered it. Consequently, I set about preparing for my production by conducting a lot of background research, including reading everything I could find on the women. At that time, this largely comprised two excellent academic books: *Radium Girls: Women and Industrial Health Reform 1910–1935* by Claudia Clark, and Dr. Ross Mullner's *Deadly Glow: The Radium Dial Worker*

*Tragedy.* These books were full of valuable information which enabled my cast and me to tell the girls' story with authenticity.

Yet as a storyteller and a non-academic, I was struck by the fact that the books focused on the legal and scientific aspects of the women's story, and not on the compelling lives of the girls themselves. In fact, I soon discovered that no book existed that put the radium girls center stage and told the story from their perspective. The individual women who had fought and died for justice had been eclipsed by their historic achievements; they were now known only by the anonymous moniker of "the Radium Girls." Their unique experiences—their losses and their loves; their triumphs and their terrors—had been forgotten, if ever charted in the first place.

I became determined to correct that omission. Through directing the play, the women had become precious to me, and I wanted to showcase their shining spirits in a book that would tell *their* story—not just the story of the famous professionals who had helped them. These were ordinary working-class women, and I aimed to chart their journey: from the joy of their first lucrative paycheck, through the first aching tooth, to the courage each girl had to find inside herself in order to fight back against the employer who had poisoned her. I wanted to walk in step with the women and describe each moment as though it was happening here and now. I hoped that, in this way, readers would be able to engage with the twists and turns of this decades-old history and to empathize with the individual radium girls. I wanted the women to feel like friends.

Naturally, I was mindful of a key responsibility: *to do justice to the girls' true story.* As an author, that responsibility took me four thousand miles across an ocean, to follow in the radium girls' footsteps in America. I wanted to walk their routes to work and visit their homes and graves. I wished to trace the path between the Maggia sisters' houses and appreciate how difficult it must have been to manage the

steep, sloping hill with a radium-induced limp. In writing the book, I was driven by a desire to give the girls a distinctive voice, so I was also looking for clues, and for the records they themselves had left behind, which would enable me to represent them.

Stunningly, my research uncovered their genuine words. Through their diaries, letters, and court testimonies, the girls had personally left behind their own accounts of what had happened to them. Their voices had been there all along, gathering dust in the archives, just waiting for someone to listen. As I delved deeper and deeper into their lives, I felt as though I became their representative, championing them one hundred years on: a facilitator allowing their own story finally to take flight.

My research began in New Jersey, but it also took me to Washington, DC, Chicago, and of course to Ottawa, Illinois, too. To stand on the site of Radium Dial, and realize that Catherine's beloved church was diagonally opposite, really brought home how much the radium companies were truly at the heart of their communities and how hard it was for the women to fight back. Meanwhile, standing in front of Catherine's house, where she had lived and died—the same house described in that riveting opening monologue of Marnich's play—felt nothing short of iconic. And I was lucky enough to interview the women's relatives, too, to find out what the heroines of my book were *really* like.

Some descendants were fairly easy to trace, having spoken out previously in interviews with their local newspapers, but others, including the family of Catherine Donohue, I had to track down through old-fashioned research. To her credit, when Catherine's great-niece received a random email at her workplace from a strange Englishwoman asking if we could meet to discuss her long-dead relative, she was gracious, generous, and helpful. In truth, all the relatives I spoke to were. Universally, they were pleased that the story was being told in this way at last, and in their interviews shared the tiny, personal details that brought the women to life in



the book. One of the most moving interviews was with Catherine's niece, Mary. When I asked if Catherine had ever cried out with the pain, Mary's recollection that her aunt had had no energy to scream, but could only moan, was particularly haunting. The families also shared childhood photographs of their aunts, sisters, and mothers; one photograph I found especially touching was of an eight-year-old Peg Looney with her grandmothers and mother. The three generations standing side by side suggested a legacy and a future that they confidently believed would stretch well into the twentieth century; little did they know that legacy would be cut short fifteen years later, with Peg's premature death from radium poisoning.

As well as conducting personal interviews and on-site research, I also spent days poring over dusty letters and yearbooks in libraries and scanning through the microfilmed records of lawyers, doctors, and newspapers. Time and again, I was moved to tears as I read through the details of the women's suffering and appreciated how real this whole "story" was: as I learned of the constricting plaster cast Quinta McDonald had to wear from her diaphragm to her knees; as I saw Mollie Maggia's x-rays, her bones shining white on black; as I held in my bare hands Catherine Donohue's final correspondence with her friend Pearl Payne, knowing that I was touching the same paper Catherine herself once had.

However, the aspect of my research that truly brought home the reality of what the radium girls endured was my series of visits to their graves. I was escorted there by their families, on separate occasions, and they stood respectfully a short distance away as I crouched down to touch the granite stones and pay my respects. Seeing the women's names engraved on those headstones, knowing that their beleaguered bodies lay beneath the sunlit grass, was a sobering reminder that they deserved to be remembered for their sacrifice. Once I was back home in England, I knew I had a duty to do my best by them, as I tried to bring their story to life.

So I took them with me, as well as I could. I wrote the book

with pictures of the women displayed around my desk; I said good morning to their faces every day. I looked eyes with them as I wrote about Grace's death; about Catherine's battle to stay alive for her children. Those photographs entwined in my mind with my vivid memories of their hometowns, as well as with their families' recollections and the knowledge I had gained of them in the archives. I charted each woman's individual journey, feeling with her the highs and lows of the fateful path that lay ahead: the desperate hope for a cure; the grief of a miscarriage; the determination to fight on, no matter what. Time and again, I was astonished by the girls' bravery and spirit in the face of unbelievably tragic suffering.

Eight-year-old Peg Looney was one of those keeping me company as I wrote. And I hope, through my book, that the legacy she and her mother and grandmothers had innocently anticipated stretching through the years has, in a way, come to be after all. I am writing now in the twenty-first century—and because of the remarkable sacrifice of Peg and her friends, they *are* still remembered. In this way, the radium girls live on, shining through the darkness of history to blaze a light for good, for strength, and for courage. It has been an enormous honor to play a small part in helping them to do that. In the end, this book belongs to them.

I simply hope that I have done them justice.

Kate Moore  
London, 2017



PEG LOONEY AND FAMILY  
PHOTO COURTESY OF DARLENE HALM  
AND THE LOONEY FAMILY.

## READING GROUP GUIDE

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 person in *The Radium Girls* that resonates more strongly with you than others? If so, what part of their story or character stands out?
3. Even after radium was proved poisonous and the girls' illness verified as work-related, the radium companies stood fast by their convictions. Why do you believe they were so resilient? Can you imagine modern companies behaving with 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 the women's 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 more than 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. Considering 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?
8. Is there another historical event where you've noticed women being pushed to the sidelines?
9. 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?
10. Besides radium, what other world-altering discoveries can you think of that led to both advancement and tragedy?
11. How were you inspired by the strength of the "shining girls," and how can you carry that onward to incite change in your own life?