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www.reachmd.com  
info@reachmd.com  
(866) 423-7849

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## The Radium Girls: The Dark Story of America's Shining Women

Dr. Russell:

A hundred years ago, a watch factory filled with young women held a very deadly, glowing risk. Welcome to ReachMD. I'm your host, Dr. John Russell. Today we're joined by Kate Moore, author of *The Radium Girls, The Dark Story of America's Shining Women*. Kate, welcome to the program.

Ms. Moore:

Thank you so much.

Dr. Russell:

So, how did you become interested in this topic?

Ms. Moore:

I first became interested in the story of the Radium Girls when I directed a play about them in London. Because I knew the play was based on a true story and was about real women, I felt this huge responsibility to do justice to their story, so I conducted lots of background research before I staged the play because I wanted to be true to the women, and I realized, through that research that there was no book that was about them. There were books about their legal legacy, and there were books about what they contributed to science, but there was no book that was about these incredibly strong, individual women and their personal stories, and I thought they deserved a book that told that story and that celebrated them, and so that's how my book came to be, because I wanted to champion the Radium Girls and tell their personal stories to the world.

Dr. Russell:

So what did we know about radium in 1917?

Ms. Moore:

Well, radium had a very different reputation than it does today. So, in 1917, people thought that radium was a wonder element. It had only recently been discovered in 1898, and people were very quick, companies were very quick to exploit this new glowing radioactive element, and there were actually... As hard as it is to believe today, there were a whole plethora of radium industries, and by that I mean there was medicinal industry that you could purchase in drugstores to treat everything from hayfever to impotence, and you could also buy radium cosmetics, face creams and soaps to give you a glowing complexion, and it was even put in things like chocolate, as well. People thought that radium was not only safe, but actually beneficial to health, so people actually drank radium water as a health tonic, and the recommended dose was 5 to 7 glasses a day.

Dr. Russell:

So, what were they doing in the Radium Luminous Materials Corporation in Newark, New Jersey?

Ms. Moore:

So, the Radium Girls were dial painters, which means they were painting watches and clocks and aeronautical dials during the First World War to make things glow in the dark, because radium has a luminous quality, and the technique that the Radium Girls were taught to paint these dials was one called lip-pointing, because the handiwork was so delicate and they needed a very fine point from their paint brushes, and so lip-pointing means they put their paint brushes laden with radioactive paint between their lips to make a fine point, and in so doing, they were swallowing the radium.

Dr. Russell:

So, you keep referring to them as girls. Were they, indeed, girls?

Ms. Moore:

They were. Most of the dial painters were teenagers, so 14, 15, 16 years of age. Actually, the records show that some of them were as young as 11.

Dr. Russell:

And they weren't the least bit nervous working around this radioactive material.

Ms. Moore:

Well, yes and no, no because of this reputation that radium had at that time. And it is actually the most valuable substance on earth, so it sold for \$120,000 for a single gram, which is the equivalent in today's money of \$2.2 million for a single gram, and so the girls thought they were lucky to work with this incredible element that had such a reputation and was so expensive, because the girls, who came from poor, working class families, generally couldn't afford the radium cosmetics and things like that, that the rich and famous were buying, so they felt blessed to work with this substance. But equally, they weren't entirely naïve about them, because Mae Cubberley, who is one of the Radium Girls I write about, she said that the first thing they asked when they were told to put the brushes in their mouths was that radium... They said the first thing we asked was, "Does this stuff hurt me?" The companies assured them it was safe, which is exactly what the girls would read in the magazine or a newspaper, but actually, that wasn't quite true. And my book about the Radium Girls actually opens with a prologue dated 1901, which is, obviously, the Turn of the Century, and it opens with a scientist receiving a radiation burn, and so that means that actually science knew of radioactivity dangers even at the Turn of the Century. But they thought that a large amount of radium was dangerous but that they could somehow harness a small amount of its power safely, but it's important to say that the reason they thought that, which was the sort of results they were finding in their research and their tests, it's important to say that that research was funded solely by the radium firms who were exploiting it, and so, of course, they found what they wanted to find so that they could build up these lucrative industries and they ignored all other evidence to the contrary that even a small amount of radium was unsafe, which, of course, is exactly what we know to be the truth today.

Dr. Russell:

If you're just tuning in, this is ReachMD Book Club. I'm your host, Dr. John Russell, and we're talking with author Kate Moore on her book *The Radium Girls*. So, was this a good job or a bad job for a 16-year-old in North Jersey at the turn of the last century?

Ms. Moore:

It was actually nicknamed the "Elite Job" for the poor working girls, and part of that was the appeal of working with radium; part of it was because of the artistic nature of the work. And I mean it wasn't just like working in any other factory. When I looked up the girls in their town directories, I found that they were listed, not as dial painters, but as artists. So this is a job that had a lot of glamor associated with it, but it was also very lucrative for the most skilled girls, for they were paid not by salary but by the number of dials that they painted each day, and records show that, actually, the top workers were in the top 5% of female wage-earners nationally. So these young women, many of them daughters or granddaughters of immigrants with no family money, found that they were actually earning more than three times what other factory girls were earning, so it was a very glamorous and lucrative and elite job

for these women.

Dr. Russell:

So, when were there signs that things weren't right for some of the health of some of these young girls?

Ms. Moore:

Well, the problem, if you will, with radium poisoning is that it's very insidious. That means it takes years to show itself. We're talking 5 years minimum. But actually for some girls, it took decades before the radium poisoning truly made itself known. It's the kind of poisoning that lies dormant inside you until it starts to sort of spring evilly to life and take over your body. And the symptoms that the Radium Girls experienced were quite, sort of, innocuous to start with. It would be a sore tooth or an aching limb, all to do with the skeleton and the bone work inside these girls, because the human body treats radium a bit like calcium. As many of your listeners will be aware, calcium is a bone seeker. If you consume the calcium from a glass of milk, it makes your bones strong because the human body deposits it in the skeleton, and that's what the girls really did to the radium they consumed from the lip-pointing from their work, and so it deposited it inside their skeletons. It was in different intensities in different places in different women. So Grace Fryer, one of the key Radium Girls I write about, had a sore back to begin with all down her spine, whereas Molley Maggia felt it in her teeth, and what would happen is that the girls' teeth would hurt, so they'd go to the dentist. They would pull them, but then that didn't solve the problem, and the next tooth started to hurt, and the next tooth, and the next tooth, until the girls didn't have to go to the dentist anymore because the teeth would fall out on their own. And Grace Fryer, on her spine when she had it x-rayed, had actually been crushed—her vertebrae were crushed by the radium because the radium, once inside their skeletons, was emanating its powerful radioactivity and it was essentially destroying the women from the inside out, so when they studied the girls, they found that they were honeycombed and moth-eaten in appearance. They had holes in them, holes that had been drilled there by the radium inside them while the women were still alive. It was an absolutely horrific poisoning.

Dr. Russell:

And it took a long time for medicine to figure out that this was the causative agent, correct?

Ms. Moore:

It did, because as I say, the received wisdom of the age was that radium was not only safe but beneficial to health, so many of the doctors who commented on the topic kind of said although these young women worked with radium and radium is a wonder element, that it can't possibly be that that is hurting them—and, of course, because radium was so lucrative and people were making a lot of money out of the medicinal use of radium as well and wanted to believe that they had found a substance that could, perhaps, miraculously lead to human immortality. And I'm not exaggerating there. That is what they thought that radium might be, that it would be the answer to truly long human lives for all, and the doctors didn't want to know. And one of the most shocking things for me about the story is that it wasn't until the first male employee of the radium firm died that a doctor finally conducted an autopsy to find out if it might be radium that was killing all these women. And dozens of women have died of radium poisoning from their work with the firm, but it wasn't until a man died that they actually paid attention.

Dr. Russell:

So the company really didn't own up to being a cause for all these young women's deaths, correct?

Ms. Moore:

Not at all, and that is truly what my book explores, because you kind of know when you pick it up you know that the women are working with radium; you know that it's radioactive as a modern reader; you know this is not going to end well. And what my book charts is the incredible fight for justice that these women embark on when they are suffering horrific pain and they are being told that there is no hope for their future, but they embark on this fight for justice because the actions of the company, even once it is proved that radium is unsafe and it's dangerous and it's hurting these women, is to cover it up, to discredit the girls, to say, "They must have been sick to begin with." They hire experts who would put up their version of the story and try to silence the doctors, such as Harrison Martland from Newark who has identified this new type of occupational poisoning, and the companies actually were totally egregious and callous. The way they try and silence these girls if they try and speak up is shocking and horrifying, and to me, the

strength and the courage and the dignity of the Radium Girls, as they are determined to hold this company to account, is quite incredible and inspiring, because the company was not only refusing to admit responsibility, but they were continuing to perpetuate the myth of radium safety so that all those radium products were still on sale and they were hurting other women in the studios. And the Radium Girls I write about: Grace Fryer, Catherine Donohue, Katherine Schaub, for example, they were determined that that had to end. They were determined to speak up about this, and because of their courage, we have landmark legal legislation to protect workers in the workplace, and we also have the gift of the scientific knowledge that they gave us and the safety standards that were directly brought about because of their courage in speaking up.

Dr. Russell:

I think it's a very beautiful book. It talks about worker safety and talks about a time that seems very incredible to us. The final point: The women ended up were proven right, but did they get justice?

Ms. Moore:

Well, I think it depends what you feel justice is. Many of the women did not get justice, but ultimately, there was a court decision that did hold employers responsible for the health of the girls, and so the justice, in the way, is that they managed to protect other women and... To me, the altruism of these girls is just extraordinary because they knew that this case wasn't really going to help them. There wasn't much money in it either. I mean, we're talking a pittance. And so, for me, and I think for them, the justice was trying to protect other people so that other people didn't have to go through what they did, and they did, at least, bring about those changes that did protect other people, millions of other people.

Dr. Russell:

So, it's a fascinating book. It's *The Radium Girls*. Author Kate Moore, thank you so much for being with us today.

Ms. Moore: Thank you for having me.

Dr. Russell:

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