

## [INTRO]

ARTizens, when humankind discovers something new, we inevitably try putting it in our mouths. And the game of “can I eat this thing” sometimes yields valuable surprises. For example, our ancestors domesticated wild animals, took their milk, mixed it with bacteria and mold, and let it age inside of animal stomachs for long enough that cheese was invented. I guess we got lucky on that one. But today we are talking about a failed experiment, one that taught policymakers in the United States an important lesson about safety regulation. Because a rich person died.

Ebenezer McBurney Byers was a wealthy howdoyoudo born in 1880. His father, Alexander McBurney Byers, was not just a rich man, but a rich and famous man. The Byers family was well-known around Pittsburgh, Pennsylvania, for several reasons. They controlled mills responsible for pumping out various iron products. They had an art collection described as “one of the finest in the United States” [1]. They were members of various bank-related administrative boards. And Ebenezer, whom everyone referred to as Eben, was quite a golfer, winning a major championship in 1906.

Even though Eben was the second youngest child out of five, he inherited large swaths of the iron empire that his father had built. This was because the oldest child was his sister, Maude, and back then women were not seen as equal under the law. Can you imagine, a female iron baron? Why, she’d probably be too conscientious to properly exploit the labor of her workers, that would never work. Instead, she was married to a banker named J. Denniston Lyon. Next oldest was Alexander McBurney Byers Junior, who died young. Followed by Dallas Cannon Byers, who despite having an amazing name, also died young. That left Eben and his younger brother J. Frederic(k?) to take over as the president and vice president of their father’s iron company, respectively [1]. The Byers family lived in an opulent L-shaped mansion [2] with one wing occupied by Maude, her husband and their children, and the other by Alexander, his art collection, and the remainder of the family. That’s where Eben grew up, with Rembrandt on the walls, at least 10 servants employed full time around the home, and in a neighborhood of Pittsburgh that included dozens of millionaires in the early 1900s.

Side note, ghost story edition: The Byers mansion is now part of a community college [13] and is reportedly haunted [D2] because one of Maude’s children fell through a skylight and died there back in 1902. Reportedly, the nanny that was supposed to be watching the child hung herself in despair. Both the child and the nanny were reportedly spotted as super spooky ghosts. The ghost story claims that Alexander never spoke to Maude again after the death of his grandchild, and considering that Alexander died in 1900 [1] and the grandchild died in 1902, that’s probably true.

But all of this wealth and fame and extravagance could not save Eben from the thing that killed him: trendy healthcare products. For you see, Eben was injured one day in 1927 after falling out of bed. Specifically, he was sleeping on his elevated bunk on a chartered train that was on a return trip from the annual Yale-Harvard football game [7]. The train suddenly lurched to a stop and he fell off of the bunk and onto his arm. A slightly different version of the story is that he got so drunk in celebration of the Yale team winning that he just drunkenly rolled off of the bunk [4]. But however it happened, it produced a permanent injury to his arm, which was a problem, because he was a golfer. He complained to several doctors about the pain [4]. Eventually, one doctor recommended something interesting. Because Eben was rich and this was the early 1900s, he would have had access to cocaine, opium, or a number of other horrifying painkillers [14]. But the doctor elected to give him something completely new and very fancy.

It was a health potion called Radithor. The manufacturer wanted people to think of it as a medicine, but get this, it wasn't. It was a small bottle of radioactive water, which meant to serve as an energy drink of sorts. You might be wondering, how do you make water radioactive? Well, that's easy, you just put radium in the water.

Radium is a dangerous radioactive element found in the earth in small quantities. Scientists working with newly discovered radioactive elements in the early 1900s were not aware of how dangerous they were to work with, and several researchers died from exposure. But the big problem was that radiation exposure kills slowly, so slowly, that the real risks were not understood for decades. Which gave capitalism enough time to find a way to sell radium to the public.

Radithor was just one of these products. It was aggressively marketed in at least two ways. Doctor recommendations, and straight-up product advertising.

First, doctors and researchers recommended radioactive water in publications, including this one from 1911 published in the British Medical Journal that claimed that drinking radium water led to many benefits including "Considerable increase in vitality, both general and sexual" [16]. Originally these recommendations were based on bathing in natural hot spring water that was a bit radioactive, but later, once money got involved, the recommendation was for drinking radioactive water in which they greatly increased the dosage of radiation. My favorite passage comes from 1921 published in The American Journal of Clinical Medicine [22]. After listing all of the reasons he hates alcohol, the author writes:

"However, like a guardian angel, radium has come to the rescue. In all its manifestations, it is the antithesis of alcohol and an antidote to its destructive action. Radium is the very essence of life; vivifies the living cell to renewed activity, promotes digestion, gives increased vigor to all

nutritive processes, stimulates the intellectual faculties, prevents insanity, rouses noble emotions by promoting a healthy brain, retards the advance of old age and creates splendid, youthful, joyous life.”

In the same article, the doctor advocates that drinking radium water is a “thoroughly safe and efficient method” and also states that “For the last six years, I have been administering radium emanation water intravenously for the treatment of diseases.” He bases his health-related claims on the fact that natural hot springs have radium in them, and that “the most popular bathing places in the world today are those in which the waters have the reputation of being strongly charged with radium emanation.”

It was later discovered that the benefits of bathing in the naturally radioactive hot springs were in fact probably not due to the radioactivity, because experiments showed that hot spring water that wasn’t radioactive still made people feel better [17].

By the beginning of the 1930s, researchers were beginning to seriously doubt the magical effects of radiation for most diseases, except for cancer. In other words, radium did seem to be useful for destroying some tumors. There is a series of before/after photos of facial tumors treated with radium from a 1922 medical text linked in the description [19]. Check them out if you’re interested and have a strong stomach.

But the problem was that some doctors were overprescribing radiation treatments for things that didn’t make sense. A reason for this was at least one company selling radioactive products was giving kickbacks to doctors, paying them money, for prescribing the radioactive products [7]. The prescriptions were often for various general annoyance problems including gout, arthritis, and renal calculus [17]. I’m going to tell you what renal calculus is in just a second, but first, please take a guess. Renal calculus is another term for kidney stones. Please drop that fun fact off in the next water cooler conversation you happen across.

Secondly, advertising for Radithor and other radium products was aggressive, appearing in all sorts of magazines, papers, and pamphlets. A common tagline used for Radithor pamphlets and ads was “perpetual sunshine” [21]. Other products touted that radiation adding energy to the body like recharging a battery. Some products were put on the surface of the skin like cleanser, lotion, and makeup products. But others were worn around the body like this testicle girdle. Yes, really. And if drinking the radiation wasn’t enough, there was always the opposite route using a radioactive suppository. Yes, really. If you do an image search online for “radium water advertising” you can see several more of these for yourself.

Radithor was a higher-end product, and cost \$1 per bottle during the great depression, which would be like spending \$13 on a coffee during the 2008 housing market crash. Radium was ridiculously expensive to make back then. Making a single gram of radium, enough for making roughly a million bottles of Radithor [18], required hundreds of thousands of dollars of materials [7]. One estimate put the needed ingredients at up to 500 tons of milling ore, 500 tons of chemicals, 10,000 tons of purified and distilled water, and 100 tons of coal [7]. Radium was a luxury item.

And because Radithor was both trendy and spendy, Eben gladly tried it. And not only did he try it, but he continued to take it for at least two years. According to the Wall Street Journal, he even sent some of it to his business partners, girlfriends, and gave some to his racehorses [24]. Arguably he was interested in the effects it would supposedly have on his notorious playboy-style love life [7].

According to a 1932 newspaper called the Reading Eagle, that literally just declared bankruptcy today on the day I'm writing this [15], Eben ended up drinking over 1400 bottles of Radithor over the course of at least two years [8, 9]. In 2019 that would be the equivalent of spending around \$21000 on a swarm of teeny-tiny robots that pump all of your bones and organs full of teeny-tiny bullets. Because that's what radiation effectively is. I'm simplifying a bit, but radium is constantly shooting out tiny bullets in every direction in the form of fast-moving particles [19]. The reason radiation destroys tumors is that it shoots holes in the DNA of cancerous cells [20]. But it doesn't discriminate, it will shoot a hole in anything. Which was unfortunate for Eben.

The thing about Radium getting inside of your body is that it mimics calcium [23], meaning that your body will mistakenly incorporate it into your bone structure [4]. From there, it will shoot out its tiny radiation bullets into your bone marrow, and your blood, and your organs, until the damage is so extensive that parts of your body begin to fall apart.

Eben's body began to deteriorate. He stopped drinking the Radithor in 1930 [24] but it didn't help because the radium was already inside of him. He got worse.

His bones began to splinter [4]. His skin turned yellow [4]. Holes began forming in his skull [24]. His upper jawbone had to be mostly removed as it was falling apart [24]. Eventually, he was too ill to move, and visitors such as lawyers came to see him and help him testify from his bedroom [9,24]. He rapidly lost weight, and at the time of his death in 1932, Eben weighed only 92 pounds [4]. According to Deborah Blum's book "The Poisoner's Handbook" his autopsy revealed "necrosis in both jaws, anemia, brain abscess (in the right cerebral cortex), damaged kidneys, and ravaged bone marrow." [4] According to the Reading Eagle, he had only six teeth remaining at the time of his death, the rest had fallen out [9]. His bones were so radioactive that

the medical examiner put some of them inside of black photography paper and film, and his vertebrae exposed the paper with their radiation, forming an image of the bone [4].

Investigations into the decline and death of Eben Byers were swift. His brother-in-law, Maude's husband, J. Dennison Lyon called for an investigation into radium [9]. They were called upon "several times to speed up the investigation" according to the Reading Eagle [9]. Even though poor people were already suffering and dying from exposure to radium, most notably young girls working in radium-product factories which I discussed in a previous episode, this time people paid attention because of the celebrity death.

Following the death of Eben Byers, researchers ramped up efforts to determine a safe amount of radiation exposure [12]. The Federal Food and Drug Administration, usually called the FDA, which is today responsible for approving the contents of things that Americans put in their bodies, did not have the power to do that at the time of Eben's death. The reason that they got their legal powers expanded in order to protect consumers from harmful ingredients was partly thanks to what happened to Eben [4].

Eben's body was buried in a lead-lined coffin at the family crypt, between his brothers Alexander and Dallas. 33 years later, in 1965, as part of a project concerning Radium, his body was briefly exhumed by a team of researchers [25]. His bones were still silently emitting the radiation that killed him.

[1] Biography of Alexander McBurney Byers [They really jerk him off in this thing, seriously, rich people are the fucking worst]

Encyclopedia of Pennsylvania Biography: Illustrated, Volume 3: John Woolf Jordan, Thomas Lynch Montgomery, Ernest Spofford, Frederic Antes Godcharies  
Lewis Historical Publishing Company, 1914 - Pennsylvania

<https://books.google.com/books?id=CuYsAAAAYAAJ&pg=RA2-PA763&lpg=RA2-PA763&dq=Alexander+McBurney+Byers&source=bl&ots=7DBz3b94QK&sig=ACfU3U2aSebZcy4asRWnawwL3yzuTTpFOw&hl=en&sa=X&ved=2ahUKEwjVw6m67JThAhWIct8KHcpcCyYO6AEwEHoECAkQAQ#v=onepage&q=Alexander%20McBurney%20Byers&f=false>

[2] <https://www.upress.pitt.edu/wp-content/uploads/2018/07/9780822944225exr.pdf> Byers-Lyon Mansion

[3] <https://www.findagrave.com/memorial/122208463/john-frederic-byers> Crypt map.

[4] Blum, D. (2011). The poisoner's handbook: Murder and the birth of forensic medicine in jazz age New York. Penguin.

[5] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1558329/pdf/amjphn00934-0003b.pdf>  
Radium Poisoning A review of Present Knowledge by Robley D. Evans, 1933

[6]  
<https://jamanetwork.com/journals/jama/article-abstract/382766> [ILL request sent] Radithor and the Era of Mild Radium Therapy

[7] [http://www.alleghenycemetery.com/images/newsletter/newsletter\\_XIII\\_1.pdf](http://www.alleghenycemetery.com/images/newsletter/newsletter_XIII_1.pdf) Eben's injury on train

[8] Reading Eagle, April 3rd 1932 "Aid asked in tracing radium poisoning"  
<https://news.google.com/newspapers?nid=1955&dat=19320403&id=SgQxAAAAIBAJ&sjid=iOEFAAAIBAJ&pg=2315.465120>

[9] Reading Eagle, April 1st, 1932 "Death of Byers leads to probe"  
<https://news.google.com/newspapers?nid=1955&dat=19320401&id=SAQxAAAAIBAJ&sjid=iOEFAAAIBAJ&pg=5629.8175>

[10] Search leading to newspapers  
<https://www.google.com/search?q=radium%20poisoning%20site:news.google.com/newspapers&source=newspapers>

[11] fancy art lists  
<http://research.frick.org/directoryweb/browserecord.php?-action=browse&-recid=7012>  
<http://research.frick.org/directoryweb/browserecord2.php?-action=browse&-recid=7012#Byers>

[12] this book sort of talks about the era around his death, thinkings of other people  
<https://books.google.com/books?hl=en&lr=&id=86HV9KBr-D0C&oi=fnd&pg=PR7&dq=Eben+Byers&ots=8ENtXMSGta&sig=LQI4HzUez7Nysp1SRry50oTthSY#v=onepage&q=Eben%20Byers&f=false> Permissible Dose: A History of Radiation Protection in the Twentieth Century by J Samuel Walker

[13]  
<https://www.ccac.edu/Footer/Campuses-and-Centers/Allegheny-Campus/Allegheny-Campus/>  
Byers hall community college

[14] Kasper, S., Sabatowski, R., Radbruch, L., Schafer, D., & Brunsch, H. (2005). Pain Treatment: A Historical Overview. *Current Pharmaceutical Design*, 10(7), 701–716.  
<https://doi.org/10.2174/1381612043452974>

[15]  
<https://www.readingeagle.com/news/article/court-documents-reveal-reading-eagle-company-road-to-bankruptcy>

[16] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2333785/pdf/brmedj07828-0020.pdf>  
Radium Water Therapy by William Armstrong (1911)

[17]  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2095935/pdf/bullnyacadmed00966-0035.pdf>  
Report on the spas of Europe pg. 563

[18] <https://www.orau.org/ptp/collection/quackcures/radith.htm> Height of bottle, some history on page, amount of radium in bottle.

[19]  
[https://books.google.com/books?hl=en&lr=&id=fOnnLk39CnAC&oi=fnd&pg=PA17&ots=Vp6lBOe16R&sig=TV3SX6paJ-sVTmnb85h\\_XSrrv7g#v=onepage&q&f=false](https://books.google.com/books?hl=en&lr=&id=fOnnLk39CnAC&oi=fnd&pg=PA17&ots=Vp6lBOe16R&sig=TV3SX6paJ-sVTmnb85h_XSrrv7g#v=onepage&q&f=false) Before/after tumor photos using radium therapy, beginning on page 162.

[20] <https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy> Radiation damages DNA in cancer cells

[21]  
<https://www.flickr.com/photos/rocbolt/47152589071/in/photolist-FiP4bn-ceLVhC-mJWpy8-8SrVCu-Lje76j-RTXyZN-ceMcPq-2aevPgM-4xHrud-2drVAHr-2eQHkXD-R5kxF8-ravRC6-qdDKpw-qTeK5v> perpetual sunshine Radithor pamphlet

[22] <https://babel.hathitrust.org/cgi/pt?id=hvd.32044097073852;view=1up;seq=116>  
Gilbert-Davis, C., (1921). Radium and its therapeutic application. *The American Journal of Clinical Medicine*, 28, 85-92.

[23] <https://www.atsdr.cdc.gov/ToxProfiles/tp144.pdf> page 21 “The affinity for bone is assumed to be related to its similarity to calcium”

[24] Winslow, R. (1990, August 1). The radium water worked fine until his jaw came off: Cancer researcher unearths a bizarre tale of medicine and roaring '20s society. *The Wall Street Journal*, p. A1.

[25] [https://inis.iaea.org/search/search.aspx?orig\\_q=RN:13647795](https://inis.iaea.org/search/search.aspx?orig_q=RN:13647795) Evans, R. D. (1981). Inception of standards for internal emitters, radon and radium. *Health Physics*, 41(3), 437-448. [Exhuming of Eben's body].

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Dubious refs

[D1] <https://talesfromthenuclearage.wordpress.com/2010/08/30/drink-radithor/> ((Contained Thorium which was cheaper...))

[D2] <http://hauntsandhistory.blogspot.com/2008/08/byers-lyons-mansion.html> spooky stories from mansion

[D3] <http://yourgolfchoice.blogspot.com/2018/01/eben-byers.html>

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Radithor

by Sam LaRussa

Photo taken at the National Museum of Nuclear Science and History in Albuquerque, New Mexico, on March 7, 2016.

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Market - Making Artisan Cheese at LoveTree Farm

by MySPNN

Published on Oct 24, 2012

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<https://www.youtube.com/watch?v=ft1vRGg4a5s>

Metalwork, abandoned US Steel iron mill

by Roy Luck

Taken on May 22, 2013

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<https://www.flickr.com/photos/21550937@N03/8907655571>

<https://commons.wikimedia.org/wiki/File:Byers-LyonsHouse.jpg>

Author: Lee Paxton

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