STUDIOCANAL AND AMAZON CONTENT SERVICES

Rosamund Pike plays Marie Curie in *Radioactive*.

Marie Curie on film

A biopic of the radioactivity pioneer fails to get under the skin. **By Georgina Ferry**

Radioactive
Director: Marjane Satrapi
Shoebox/Working Title/StudioCanal (2019)

Surfaces in *Radioactive* catch the eye. Rainwashed Parisian cobbles, blackboards, laboratory glassware, the textures of linen and woollen clothing, even – startlingly – naked skin; all are carefully framed and lovingly lit. But this is a film that should be about inner workings: of the atom, certainly, and of the mind and emotions of an extraordinary woman. Who was Marie Curie, and how did she become the only person ever to win Nobel prizes in two scientific disciplines? *Radioactive* gives only a partial answer.

The action begins in the 1890s, with the young Polish physicist Marie Skłodowska, played by Rosamund Pike (who received tutoring in chemistry and physics from senior *Nature* reporter Elizabeth Gibney). Established in Paris as an independent researcher, she is unsuccessfully fighting dour professor Gabriel Lippmann (an undemanding role for a bewhiskered Simon Russell Beale) for resources to continue her work on the properties of steel. How she came to leave Warsaw for Paris, and what inspired her passion for science, are left to the imagination.

Thereafter, the film unfurls as a sequence of big moments in Curie's career. Marie literally bumps into Pierre Curie (Sam Riley) in the street! Marie rejects, and then accepts, Pierre's offer of lab space! Pierre gives Marie an electrometer and she agrees to collaborate on investigating the properties of uranium! They fall in love and go skinny dipping! It felt like a graphic novel, and only later did I remember that French Iranian director Marjane Satrapi first found fame for her graphic-novel series *Persepolis*, published between 2000 and 2003.

Free with the facts

The historical accuracy of these graphic frames is variable, and although dramatic licence is legitimate, there are limits. One particularly egregious example is a scene in which Pierre returns from Stockholm after giving his Nobel lecture, to find a furious Marie picking up children's toys and berating him for treating her as "just a wife". In fact, he refused to accept the 1903 prize for physics unless she was included as an equal partner. Neither of them attended the ceremony that year, and both went to Stockholm two years later, when Pierre actually delivered the lecture.

The recreation of the period setting is more successful. The bare shed that the Curies convert into a lab to conduct most of their important experiments is well realized, as are the severe black and navy outfits that Marie Curie favoured because they would not reveal her extremely dirty working conditions, pounding tonnes of pitchblende in a bathtub to extract radioactive materials for analysis.

Pike does her best to inject psychological nuance into a script that is heavy on exposition. For instance, a conveniently ignorant guest provides an opportunity for introductory atomic physics across the dinner table (a graphic animation is provided for the viewer's benefit). And Pike is given few opportunities to deviate from an emotional register tuned to 'angry and frustrated'. The moment when, alone, Marie gives way to grief at Pierre's shocking death in a 1906 traffic accident is genuinely moving.

Yet the most rewarding pairing in the film is between Marie and her 17-year-old daughter Irène (Anya Taylor-Joy) as they establish mobile radiography units during the First World War and drive them into the battlefield to X-ray wounded soldiers and prevent unnecessary amputations by gung-ho military surgeons. We also see Marie's pride in Irène's own research on artificial radioactivity, which would win her and

her husband Fréderic Joliot their own Nobel prize just a year after Marie's death.

How convincing is this portrayal of the life scientific? Satrapi's film falls straight into the 'lone heroes' trap, presenting Marie as a solitary battler with only her faithful husband and daughters (plus a few students) on her side. Before the closing credits, a genuine historical photo flashes up, of Marie Curie at the 1927 Solvay Conference in Brussels with Albert Einstein, Niels Bohr, Erwin Schrödinger and all the other luminaries of early-twentieth-century physics. Apart from this one image, the film gives no sense that she was a respected equal member of this international community, and so distorts both her position as a female scientist and the reality of how science advances.

Long legacy

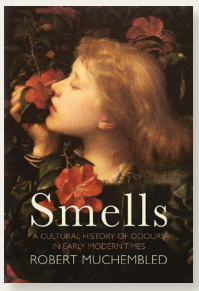
Satrapi could have allowed the story to evolve at a more leisurely pace had she spent less time hammering home the legacy of the Curies' work on radioactive elements. As the conversation between the pair turns towards possible therapeutic uses, we are transported to a mid-twentieth-century cancer clinic in the United States, where a wide-eyed little boy is to receive radiotherapy for a tumour. Similar flashes forward take in the nuclear attack on Hiroshima in 1945; bomb tests in the Nevada Desert in the 1960s; and the reactor meltdown at Chernobyl in 1986. *Radioactive* is based on the beautifully illustrated and scrupulously referenced 2010 Curie biography of the same name by author and artist Lauren Redniss — adapted by screenwriter Jack Thorne — which made similar allusions, but for me these scenes simply don't work in the context of the film.

In his Nobel lecture (accurately shown in *Radioactive*), Pierre Curie asked "whether mankind benefits from knowing the secrets of Nature, whether it is ready to profit from it or whether this knowledge will not be harmful for it". Neither he nor Marie foresaw how harmful radioactivity could be — nor how beneficial. Cinema-goers of 2020 know only too well, yet the director has not trusted her audience to make the links between what scientists discover and the use society makes of discoveries.

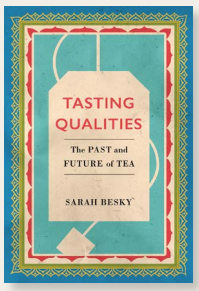
To too many, Marie Curie is little more than the name of a pioneering female scientist, associated in some way with radioactivity (a term she coined). *Radioactive* fills in much of the detail of her scientific and personal life, and is worth watching if you don't already know the story. Ultimately, I wished that the filmmakers had trusted viewers to find interest in the complex, driven, passionate woman at the heart of this story because of her intense desire to solve nature's secrets, not in spite of it.

Georgina Ferry is a science writer and the biographer of researchers Dorothy Crowfoot Hodgkin, Max Perutz and John Sulston.
e-mail: georgina.ferry@gmail.com

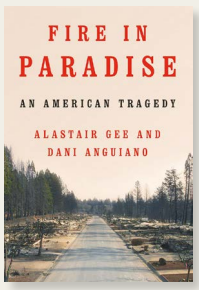
Books in brief



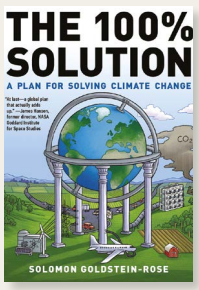
Smells
Robert Muchembled (transl. Susan Pickford) Polity (2002)
In 2014, a paper based on experiments with 26 people claimed that humans can discriminate between more than one trillion olfactory stimuli. Its mathematical model was heavily criticized; it's more likely, as French historian Robert Muchembled says, that smell is "the only one of our senses to be acquired from experience". Thus, European children take around five years to feel disgust at their own excrement. With pungent examples, this lively history charts the transformation of smells from the Renaissance to the early nineteenth century.



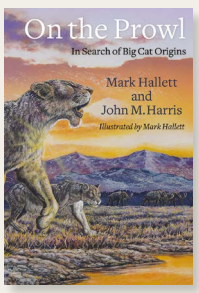
Tasting Qualities
Sarah Besky Univ. California Press (2020)
The Indian prime minister projects himself as the son of a railway-station tea-seller; tea is part of Indian identity. Yet the tea served there for mass consumption since the 1950s is shaped by machinery into tiny balls reminiscent of coffee granules, rather than the traditional Indian twists of hand-picked leaves — one of many intriguing observations by anthropologist Sarah Besky, from extensive experience of plantations and auction rooms. Her nuanced study of Indian tea, although overly academic, is a refreshing brew of botany, business and culture.



Fire in Paradise
Alastair Gee and Dani Anguiano W. W. Norton (2020)
The 2018 Camp Fire that almost destroyed the town of Paradise in northern California, killing at least 85 people, has become "a poster child for the climate crisis", note journalists Alastair Gee and Dani Anguiano. Their account, based on interviews with residents, firefighters and academics, is horrendous, especially the section 'Hell', describing the fire minute by searing minute. It confirms how humans, not nature, are responsible for disasters — a spark from an electricity tower, well past its replacement date, triggered the inferno.



The 100% Solution
Solomon Goldstein-Rose Melville House (2020)
Solomon Goldstein-Rose was elected to the Massachusetts state legislature in 2016, aged 22, on a platform focused on climate change. This keenly practical prospectus targets the 2020 US national elections. But he observes that any political will in industrialized countries to reduce carbon dioxide emissions can never overcome "basic economic realities" in developing countries, which produce two-thirds of global emissions. So industrialized countries, responsible for global warming, must also bear the brunt of reducing emissions.



On the Prowl
Mark Hallett and John M. Harris Columbia Univ. Press (2020)
Among the copious illustrations in this erudite history of big cats by naturalists Mark Hallett and John Harris is a photograph of a US cave floor showing beautifully preserved footprints of a jaguar that took its prey underground, became disoriented and died tens of thousands of years ago. An illustration by Hallett shows a resting pride of hungry, fly-ridden Asiatic lions in India — the remainder of a population that once ranged from western Asia to the Mediterranean. The authors argue for renewed efforts to preserve endangered carnivores. **Andrew Robinson**