

Graphic Histories

BY REBECCA ONION*

EUGENE BYRNE and SIMON GURR. *Darwin: A Graphic Biography*. Washington, DC: Smithsonian Books, 2013. 96 pp., illus. ISBN 978-1-58834-352-9. \$9.95 (paper).

APOSTOLOS DOXIADIS and CHRISTOS H. PAPADIMITRIOU. *Logicomix: An Epic Search for Truth*. New York: Bloomsbury, 2009. 347 pp., illus. ISBN 978-1-59691-452-0. \$22.95 (paper).

JONATHAN FETTER-VORM. *Trinity: A Graphic History of the First Atomic Bomb*. New York: Hill and Wang, 2012. 154 pp., illus. ISBN 978-0-8090-9355-7. \$14.95 (paper).

JIM OTTAVIANI and LEYLAND MYRICK. *Feynman*. New York: First Second, 2011. 272 pp., illus. ISBN 978-1-59643-827-9. \$19.99 (paper).

LAUREN REDNISS. *Radioactive: Marie & Pierre Curie: A Tale of Love and Fallout*. New York: Harper Collins, 2010. 208 pp., illus. ISBN 978-0-06135-132-7. \$29.99 (hardcover).

Librarian and author Jim Ottaviani, who has written graphic novels about science and scientists for more than a decade, had to self-publish for years.¹

*Rebecca Onion is a visiting scholar in the department of history at Ohio University, 18 Garfield Avenue, Athens, OH, 45701, rebeccaonion@gmail.com.

1. Jim Ottaviani, *Fallout: J. Robert Oppenheimer, Leo Szilard, and the Political Science of the Atomic Bomb* (Ann Arbor, MI: G.T. Labs, 2001); Jim Ottaviani and Donna Barr, *Dignifying Science: Stories about Women Scientists* (Ann Arbor, MI: G.T. Labs, 2003); Jim Ottaviani and Leland Purvis, *Suspended in Language: Niels Bohr's Life, Discoveries, and the Century He Shaped* (Ann Arbor, MI: G.T. Labs, 2004); Jim Ottaviani and Big Time Attic (Firm), *Bone Sharps, Cowboys, and Thunder Lizards: A Tale of Edwin Drinker Cope, Othniel Charles Marsh, and the Gilded Age of Paleontology* (Ann Arbor, MI: G.T. Labs, 2005); Jim Ottaviani, *Wire Mothers: Harry Harlow and the Science of Love*, 1st ed. (Ann Arbor, MI: G.T. Labs, 2007). Ottaviani books

Historical Studies in the Natural Sciences, Vol. 45, Number 4, pps. 621–629. ISSN 1939-1811, electronic ISSN 1939-182X. © 2015 by the Regents of the University of California. All rights reserved. Please direct all requests for permission to photocopy or reproduce article content through the University of California Press's Rights and Permissions website, <http://www.ucpressjournals.com/reprintinfo.asp>. DOI: 10.1525/hsns.2015.45.4.621.

“I didn’t work in a total vacuum [or] complete obscurity,” he told an interviewer after the success of his best-selling graphic-novel biography *Feynman* in 2011, “but this is what I heard every time when I talked to established comics companies: ‘I’d love to read that—when someone else publishes it.’” The scientific biography, told in comics form, seemed to fall into a no-man’s land between traditional comic presses and nonfiction trade publishers. “The few times when I attempted to talk to non-comics publishers, their response was, ‘We don’t know how to sell that’ and/or ‘Nobody will buy that,’” Ottaviani remembers.²

Ottaviani’s newfound ability to place a book with an established press (and get it on the *New York Times* bestseller list), as well as the general success of a cohort of recent history-of-science themed graphic novels, coincides with a new “boom” of popular science in the United States. These books join several other recent science successes across media new and old: the popular Neil DeGrasse Tyson revival of *Cosmos*; thriving picture-based science fandoms on the Internet; a proliferation of new science-oriented web magazines and blogs catering to an audience hungry for “ideas.”³ There is a general appetite for intelligent nonfiction, and popular works of science and history of science are part of that trend.

When we consider the representation of science in today’s popular media, we should also look at the ways that other types of knowledge—historical, social, economic—are being reimagined. Andreas Daum reminds us that we should think of the history of popular science as part of a larger project looking at the “transformation of public knowledge across time, space, and cultures.”⁴ With this wider view, the books under review here are part of a larger evolution of the graphic-novel form toward nonfiction in the past few decades.⁵ Some of

published by others include *Feynman*; Jim Ottaviani, Zander Cannon, and Kevin Cannon, *T-Minus: The Race to the Moon* (New York: Aladdin, 2009); and Jim Ottaviani, *Primates: The Fearless Science of Jane Goodall, Dian Fossey, and Biruté Galdikas* (New York: First Second, 2013).

2. Alex Dueben, “Ottaviani Relates the Extraordinary Life of ‘Feynman,’” *Comic Book Resources*, September 20, 2011, <http://www.comicbookresources.com/?page=article&id=34480> (accessed 18 Jun 2015).

3. *Cosmos: A Space-Time Odyssey* (21st Century Fox, 2014); Joe Veix, “For Those Who Hate ‘I F*cking Love Science,’” *Death and Taxes*, <http://www.deathandtaxesmag.com/219979/for-those-who-hate-i-fcking-love-science/>; “Aeon Magazine—Ideas and Culture,” *Aeon Magazine*, <http://aeon.co/magazine/>; “Nautilus,” *Nautilus*, <http://nautil.us/> (all accessed 18 Jun 2015).

4. Andreas W. Daum, “Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections,” *Isis* 100, no. 2 (2009): 320, doi:10.1086/599550.

5. *Ibid.*

the most critically acclaimed graphic novels in the recent boom have been autobiographical, historical, or otherwise nonfictional: Art Spiegelman's *Maus* (1991), Joe Sacco's *Palestine* (1993), Alison Bechdel's *Fun Home* (2006). These nonfictional works have acted as ambassadors, solemnizing the graphic novel in the eyes of onlookers, and encouraging publishers to take chances on similar projects.

When viewed as a new form of scientific biography, this group of graphic novels meets several challenges to the genre that have arisen in the past half-century. The individualistic nature of a biography, its tendency to make protagonists into heroes, and its general tendency to select "great men" as subjects have all come under fire from historians of science. Feminist scholars have bemoaned the lack of female representation in scientific biographies, not only of female scientists but also of the women in male scientists' lives.⁶ Perhaps most of all, scientific biography runs the danger of obscuring the socially enmeshed nature of the scientific enterprise. In their consideration of scientific biographies, Richard Yeo and Michael Shortland write that biographies written of individuals "[stand] in an awkward relation with another powerful ethos of the Western scientific enterprise since the seventeenth century—the social, cooperative nature of scientific thought and method in which the contributions of individuals are tested by others and then, only tentatively, added to the store of knowledge."⁷ Borrowing from anthropologist James Clifford, they argue that scientific biography has relied on a "myth of personal coherence."⁸ From the perspective of historians of science who are trying to make clear the contingent and enmeshed nature of scientific enterprise, the popularity of such biographies can be frustrating.

The comic format has the potential to answer some of these conundrums through a multitextured approach to narrative. Writing about the work of feminist graphic novelists like Alison Bechdel, Phoebe Gloeckner, and Aline Kominsky-Crumb, Hilary L. Chute points out that such works have a particular set of strengths when it comes to telling life stories. Comics, Chute writes, are "an idiom of witness," "a manner of testifying that sets a visual language in motion with and against the verbal in order to embody individual

6. Mary Jo Nye, "Scientific Biography: History of Science by Another Means?," *Isis* 97, no. 2 (2006): 323, doi:10.1086/504738.

7. Michael Shortland and Richard R. Yeo, "Introduction," in *Telling Lives in Science: Essays on Scientific Biography* (Cambridge: Cambridge University Press, 1996), 36.

8. *Ibid.*, 14.

and collective experience, to put contingent selves and histories into form.”⁹ In other words, the graphic novel is an ideal format in which to disrupt that “myth of personal coherence.”

As we may now be far enough into the graphic novel boom to be able to shed this caveat, here goes: “comics” doesn’t need to mean “a simplified form of art, intended for kids.” In *Understanding Comics*, Scott McCloud defines the medium simply: “Juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer.”¹⁰ Comics creators have done this in simple ways, and in complex ones; the great graphic novels of the past decades could be said to be more mature evolutions of the form, creating more challenging juxtapositions and sequences, and provoking more varied aesthetic responses, but simple and complex approaches to comics can still be found in the marketplace. In this essay, I will follow McCloud and Chute in using the word “comics” to refer to the medium. The term “comic book” can be applied to serialized stories presented in shorter periodical format. “Graphic novel” is a term used for self-contained, novel-length works executed in comics form.

In writing stories about scientists’ lives, and scientists’ work, these graphic novels have several advantages over conventional texts. They can meld stories of the scientists’ lives in private, public, and the laboratory, showing—rather than telling—how the personal was scientific and vice-versa. They can use images to demonstrate scientific principles and to show, at many different scales, how experiments were executed. And graphic novels can leverage the visual to tell historical stories in an affective dimension, giving readers a sense of how it *felt* to work on the Manhattan Project, to discover radium, or to devote a decade of one’s life to a single study. These graphic novels build upon an earlier wave of scientific biographies presented more simply as comic books, which were expressly intended to educate and inspire future scientists by cloaking stories of success in palatable pictures. Bert Hansen has written about the medical history *True Adventures* that found an audience in the 1940s, as comics were at the height of their influence in children’s culture. The heroes of these “biographies”—Walter Reed, Louis Pasteur, Edward Jenner, Robert

9. Hillary L. Chute, *Graphic Women: Life Narrative and Contemporary Comics* (New York: Columbia University Press, 2010), 2.

10. Scott McCloud, *Understanding Comics: The Invisible Art* (New York: HarperPerennial, 1994), 9.

Koch—were portrayed as swashbuckling, uncompromising “germ tamers.”¹¹ In these instances, comics creators didn’t exploit the visuality of the medium to create the kinds of layered, complex narratives found in contemporary graphic novels. Published by well-meaning science popularizers, such books noted the vogue for superhero and adventure comics and stepped into that mold, with a view to exploiting a fad for the greater good.

The only volume in the group under review that could be accused of such heroic simplicity is Eugene Byrne and Simon Gurr’s *Darwin: A Graphic Biography*. The subtitle of the book is *The Really Exciting and Dramatic Story of a Man Who Mostly Stayed at Home and Wrote Some Books*, an opening rhetorical gambit meant to comment on the perceived distance between Darwin and a traditional comic book “hero.” The volume is aimed at young readers, and perhaps this line is pre-emptively defensive about apparently incongruous subject matter; however, there is plenty of interest in Darwin’s life—both scientific and personal—and there are many popular Darwin biographies to prove that point. In perhaps the most condescending touch, the authors use an awkward framing device (two talking primates who are hosting a “nature show” and need to be educated on the history of the theory of evolution) to inject some unneeded humor into Darwin’s life story. This is a graphic novel that seems to have more in common with its antecedents than its peers.

In contrast, Jonathan Fetter-Vorm’s *Trinity: A Graphic History of the First Atomic Bomb*, recommended by the Young Adult Library Services Association, manages to convey some of the gravity and strangeness of the Manhattan Project, as well as teach readers some atomic science. Perhaps the best parts of *Trinity* are the images of the bomb itself, which, through deft sequencing of text and images, imbue technology with feeling. In one sequence, set before the Trinity test, Oppenheimer, in his office, thinks of the tale of Arjuna viewing Krishna’s unveiling, from the *Bhagavad Gita*. On one page, in text boxes laid over images of the scientist, Oppenheimer recites lines in Arjuna’s voice: “You have numberless arms, and the sun and moon are among your great, unlimited eyes. By your own radiance you heat the entire universe.” Then, on the next page, the “Gadget,” draped with wires and studded with ignition switches, appears in front of a backdrop of black and white rays,

11. Bert Hansen, *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America* (New Brunswick, NJ: Rutgers University Press, 2009); Bert Hansen, “True-Adventure Comic Books and American Popular Culture in the 1940s: An Annotated Research Bibliography of the Medical Heroes,” *International Journal of Comic Art* 6, no. 1 (Spring 2004): 117–47.

signifying a splash of power and energy. The text box reads “O mighty one, be gracious toward me!” The page does an excellent job of animating the inanimate, using a placement and visual style that evokes the emotion attached to the object. This is an approach that would be possible in text, but would be much less accessible and immediate.

In Fetter-Vorm’s book, comics’ sequential visual style lends itself to lyrical meditations on cause and effect, both scientific and social. In particular, two sequences depicting the Trinity test and the Nagasaki bombing echo each other, evoking a direct chronological comparison between the timescale of the chain reaction and the timeline of the effects on the human city. The pages describing what happened inside the Trinity bomb when it went off, look at the science of its ignition quickly, then take us through a series of images that capture the effects stage by stage. Later in the book, Fetter-Vorm uses another stark six-page sequence to show the effects of a bomb on a human body—a Japanese boy in Nagasaki. The sequence, which is textless and almost empty except for the body of the boy, forces us to reckon with his pain.

Fetter-Vorm uses imagery to indicate the contingency and unknowability of biography. In a two-page spread introducing J. Robert Oppenheimer, Fetter-Vorm illustrates a multiplicity of perspectives. “It’s difficult to know just what kind of man he was,” a text box admits at the top. Snapshots of Oppenheimer, splashed across the page as if tossed down on a coffee table, are labeled with adjectives—“Brilliant,” “Charismatic,” “Troubled,” “Arrogant”—and interspersed with biographical details supporting each adjective. The visual trick of the fanned-out photographs reminds us of the man’s full life-span, as well as the multiple perspectives on that life.

Jim Ottaviani’s graphic novel *Feynman* (with artwork by Leland Myrick) also includes sequences related to the Manhattan Project, but its subject is much more solidly biographical. The growing popularity of Feynman as a legend—reviewing the book in the *Washington Post*, writer Monica Hesse called him “The people’s particle physicist. The cute one.”—must have propelled Ottaviani’s choice of subject, but the book manages to integrate the many phases of the physicist’s life, and to do some work at showing the context within which he worked.¹² According to Freeman Dyson, who has

12. Monica Hesse, “Physicist Richard Feynman Is Hero of New Graphic Novel,” *The Washington Post*, 30 Sept 2011, http://www.washingtonpost.com/lifestyle/style/physicist-richard-feynman-is-hero-of-new-graphic-novel/2011/09/13/gIQA0GR4AL_story.html (accessed 18 Jun 2015).

a cameo in the story and who reviewed the book, the wry, self-deprecating star of the graphic novel “somehow comes to life and speaks with the voice of the real Feynman.”¹³

Of the five books under review, *Feynman* tries the hardest to explain the actual science being done. A sequence late in the book called “QED in NZ,” which represents the lectures that the physicist wrote for nonscientists to try to explain his theory of quantum electrodynamics, is full of diagrams, as the scientist vanishes and the science takes center stage. Ottaviani has said that the scientific sequences were “the toughest to write,” taking up “less than 10% of the book” but representing “40% of the effort.” “Comics is a great tool for explaining science,” he said, “but that doesn’t mean it’s an easy tool to use well.”¹⁴

For some readers, attuned to Feynman’s fraught history with women, the Feynman visible in Ottaviani’s narrative will be too likable by half. Although the story does point to the physicist’s habits of picking up Cornell undergrads and spending time in strip clubs, the darker side of these proclivities—I’m thinking of the chapter in *Surely You’re Joking, Mr. Feynman!* called “You Just Ask Them?,” in which the scientist recounts a mean-hearted “experiment” in manipulating women into sex—goes unmentioned.¹⁵ It’s too bad, because Ottaviani is otherwise deft at showing how Feynman’s scientific habits of mind translated into many aspects of his life. It would have been interesting to see how the author might have handled this sequence.

Whereas *Feynman* pulls some punches in representing its likeable subject, Apostolos Doxiadis and Christos Papadimitriou’s *Logicomix: An Epic Search for Truth*, about Bertrand Russell’s early work in logic and mathematics, introduces a thinker whose drive to comprehend an intellectual conundrum is personally destructive to his life. We watch Russell, who had a family history of mental illness, work himself sick, alienate his wives, and make and break friendships, in the course of trying to determine the absolute foundations of mathematical reasoning.

In its efforts to dramatize the conflicts of Russell’s life, *Logicomix* may border on misleading its readers. Philosopher Paolo Mancosu notes the several

13. Freeman Dyson, “The ‘Dramatic Picture’ of Richard Feynman,” *The New York Review of Books*, 14 Jul 2011, <http://www.nybooks.com/articles/archives/2011/jul/14/dramatic-picture-richard-feynman/> (accessed 18 Jun 2015).

14. Dueben, “Ottaviani Relates the Extraordinary Life of ‘Feynman,’” (ref. 6).

15. Richard Phillips Feynman, *Surely You’re Joking, Mr. Feynman!: Adventures of a Curious Character*, 1st ed. (New York: W.W. Norton, 1984).

biographical deviations bordering on historical errors in the book (meetings between Russell and Georg Cantor and between Russell and Gottlob Frege that never took place; the characterization of Frege as a “lunatic and rabid anti-semitic,” which Mancosu argues is overblown).¹⁶ Perhaps more disturbing and significant, given its importance to the book, Mancosu argues that the supposed “quest for certainty” that drives *Logicomix*’s narrative up to 1939 was something that Russell himself had drifted away from in the first decade of the twentieth century.¹⁷ The authors, Mancosu argues, have amplified Russell’s interest in certainty in order to heighten dramatic tension. Similarly, the theme of mental disturbance, Mancosu believes, received undue emphasis—an emphasis that he argues is politically hurtful to the discipline’s image in the public eye: “I find the suggestion running through *Logicomix* that there is an intrinsic association between madness and the pursuit of certainty in the foundations of mathematics to be unfounded, misleading, and potentially damaging.”¹⁸ Given the importance of this “quest” and its personal consequences to the volume’s story, this criticism is fairly damning, and reveals one of the pitfalls of a graphic novel’s attempt to create narrative out of intellectual life.

Lauren Redniss’s *Radioactive: Marie & Pierre Curie: A Tale of Love and Fallout*, an ethereal “biography” of the Curies that is also a visual history of radioactivity across the twentieth century, is the volume from this group that received the most critical acclaim, with a nomination for a National Book Award among its laurels. Reviewing the book in *Science*, Hanna Rose Shell called the work an “emotional history” of radioactivity, a description that accurately sums up the strange moodiness of the work.¹⁹ Although *Radioactive* still fits Scott McCloud’s all-purpose definition of “comics”—“juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer”—it feels more like a scrapbook than a narrative graphic novel.²⁰

Rendered using cyanotype prints—a visual approach that evokes the X-ray and the darkroom—its pages tell the story of the Curies, weaving in other

16. Paolo Mancosu, “Book Review: *Logicomix* by Apostolos Doxiadis, Christos H. Papadimitriou, Alecos Papadatos, and Annie di Donna,” *Journal of Humanistic Mathematics* 1, no. 1 (January 2011): 144.

17. *Ibid.*, 147.

18. *Ibid.*, 151.

19. H. R. Shell, “A Seance for Science,” *Science* 332, no. 6026 (April 8, 2011): 176, doi:10.1126/science.1204034.

20. McCloud, *Understanding Comics* (ref. 10), 9.

histories related to radioactivity: early-twentieth-century ballerina Loie Fuller's hunger for a radium costume; the testimony of a cancer patient with non-Hodgkins lymphoma who was saved by radiation treatment in 2001; the story of a witness of the Three Mile Island accident who went on to collect specimens of plants malformed by radiation. Redniss also reprints pages of documents: physicist Irving Lowen's FBI file; paper cut-outs made by Hiroshima resident Sadae Kasaoka to represent her father's injuries; a photograph of Marie lecturing at the Sorbonne, her face blurred out as she turns to demonstrate a concept, while the mustachioed gentlemen in the audience regard the camera, their own faces sharply defined.

I chose to discuss *Radioactive* last because it exemplifies the possibilities that graphic novel formats hold for scientific biography. A *sui generis* book, more object than story, it's an art project that picks up and weaves together the social threads that tie the Curies' work to the rest of the century. Rather than force an argument upon the reader through the strenuous heavy lifting of textual transition, Redniss is free to plead her case in a subtler way, suggesting and implying through deft visual gestures, trusting that the reader will understand the significance of these connections. Redniss's well-compiled visual and material history of radioactivity makes an excellent argument for the socially embedded nature of science.

Although none of the books under review will break new ground for readers attuned to the relevant historiographies, their work lies in representing science as it has been embedded in society. The simple act of rendering scientific lives in sequential images—of showing Feynman working with labmates, or Russell trying to sleep while his baby cries, or Bohr and Oppenheimer hiking at Los Alamos—opens space to think of science as a human endeavor. And the possibilities of visuality allow readers to feel something of the emotions of the history being conveyed: the pleasure of discovery, the stress of work, and the weight of moral obligation.