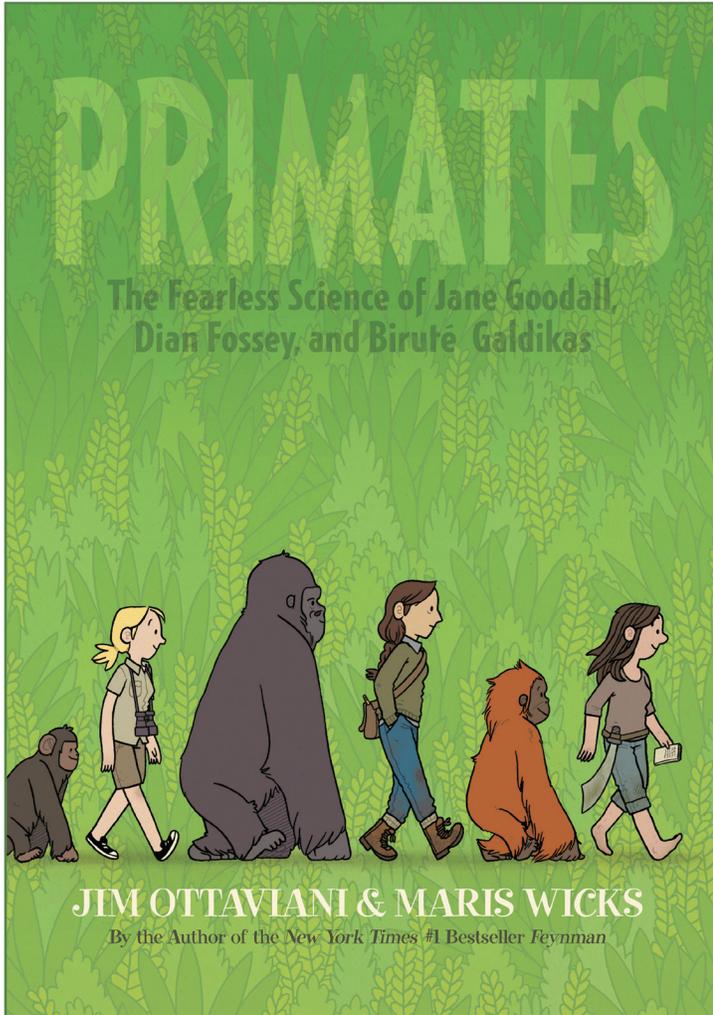


PRIMATES

The Fearless Science of Jane Goodall, Dian Fossey, and Biruté Galdikas

JIM OTTAVIANI & MARIS WICKS



INTRODUCTION

Primates is a book about doing science and being a scientist. Jane Goodall, Dian Fossey, and Biruté Galdikas all did groundbreaking field research in primatology, and that led them to break further ground in terms of our awareness of the fragile relationship we have with the natural world and our closest evolutionary kin. Techniques they pioneered have led to a new understanding of what makes us human and the importance of conservation . . . ideas as important today as they were when these three scientists entered a male-dominated profession and showed the world what patience and courage could achieve.

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ABOUT THE BOOK

This is the true story of three scientists—Jane Goodall, Dian Fossey, and Biruté Galdikas—who risked their lives for research that forever changed the way we think of primates . . . including ourselves. Recruited by the great anthropologist Louis Leakey, these remarkable women are responsible for some of the biggest advances in both primatology and our understanding of what it means to be human.



ABOUT THE AUTHOR AND ILLUSTRATOR



Portraits by Maris Wicks

JIM OTTAVIANI wrote *Primates*. In addition to being the author of the *New York Times* #1 Bestseller *Feynman*, his graphic novels about science and scientists have been nominated for multiple awards, including Eisners and the ALA Popular Paperback of the Year. They also receive critical praise in publications ranging from *The New York Review of Books* to *The Comics Journal* to *Physics World* to *Entertainment Weekly* to *Nature*. And *Vampirella Magazine* too. (Who would have guessed?!)



MARIS WICKS drew *Primates*. In addition to drawing comics for Adhouse Books, Tugboat Press, Spongebob Comics, Tanglewood Press, and now, First Second, she's a program educator for the New England Aquarium. She let Jim pet the sharks when he visited . . . she's cool that way.

OBJECTIVES

This guide, along with *Primates* itself, will help teachers enhance units on primatology and evolution, as well as those that relate to more broad principles such as using the scientific method and doing field research. Writing the history of anything means making choices, so the book also challenges the reader to think about what we left out, and why we selected the scenes, stories, and ideas that do appear in the book. And the choice of telling this story as a graphic novel is implicit in all of this, so some of the sample questions below will suggest ways to discuss graphic narratives in a more general sense.

FOCUS ON . . .

Women in Science

Jane Goodall, Dian Fossey, and Birute Galdikas broke new ground—both literally and figuratively!—in science. *Primates* provides a perspective on the early attitudes of other (male, in most cases) scientists towards women in their profession. It's still an issue today, even though the majority of Ph.D.'s in biology from U.S. universities are awarded to women.

Primatology

Jane Goodall, Dian Fossey, and Birute Galdikas were the first to do extended studies of primates in their natural environment, or descriptive natural history, as science writer Carl Zimmer puts it.

Primatology isn't like that today; it now involves experimental tests of hypotheses about ecology and behavior, tests which require statistics and mathematical models. Current research is also often informed by work done in genetics and neurobiology as well. But without the work done by Goodall, Fossey, and Galdikas none of this new research would have happened.

FOCUS ON . . .

Anthropomorphism

As Jane Goodall put it in a recent interview, “[My] professors were extremely critical with me having given names to chimpanzees and talking about ‘their personalities.’ They said I should have given them numbers and they didn’t think they had any sort of personality. But I knew I was right, because another professor, my dog Rusty, had shown me how animals can have personalities and anyone who has a dog or a cat knows it.”

<http://www.uab.es/PDF/PDF_1336977130622_en.pdf>

There is a real danger in anthropomorphism, since assigning human motives to non-human animals can mislead scientists—and you and me—into seeing their behaviors through the filter of our experiences and desires as opposed to theirs. But that doesn’t mean those behaviors aren’t complex as our own.

Conservation

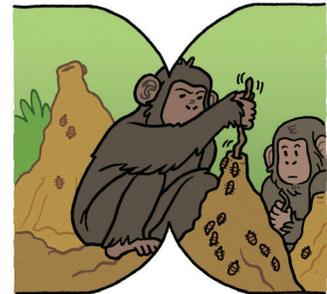
As if naming their subjects wasn’t bad enough, Fossey, Galdikas, and Goodall all eventually became outspoken with regards to environmentalism and conservation. Many of their colleagues considered these topics too political. Many still do, though there’s no reason why scientists can’t have opinions on subjects that relate not only to their research but also touch on the lives of everyday people—and animals—everywhere.

Nonfiction Graphic Novels

Is it a graphic novel? Well, this is a mostly true story (see our Afterword), so ‘novel’ isn’t the right word. The label really doesn’t matter, in the end, and most folks who make comics don’t worry too much about what they’re called. What matters is that *Primates* is a book that tells a story about real people who changed the world.



“ [My] professors were extremely critical with me having given names to chimpanzees and talking about ‘their personalities.’ They said I should have given them numbers and they didn’t think they had any sort of personality. ”



TERMS: DEFINITIONS.

acclimatization: the process of responding physiologically or behaviorally to a change in a single environmental factor

anthropologist: a person who studies human societies and cultures and their development

arboreal: living in trees

bedraggled: dirty and disheveled

benefactor: a person who gives money or other help to a person or cause

eco-tourism: tourism directed toward exotic, often threatened, natural environments

ecology: the branch of biology that deals with the relations of organisms to one another and to their environment

evolution: the process by which different kinds of living organisms have developed and diversified from earlier forms

fieldwork: scientific work conducted by a researcher in the natural environment, rather than in a laboratory or office

fortitude: courage in the face of pain or adversity

fossil: the remains or impression of a prehistoric organism preserved in petrified form or as a mold or cast in rock

habitat: the natural home or environment of an animal, plant, or other organism

herbivore: an animal that eats plants

human: the species we belong to; that's obvious, but what does being human mean?

hypothesis: a proposed explanation based on limited evidence; a guess used as a starting point for further investigation

memoir: a historical account or biography written from personal knowledge
natural selection: the process through which organisms better adapted to their environment tend to survive and produce more offspring; the theory of evolution through natural selection was first fully laid out by Charles Darwin

paleontology: the branch of science concerned with fossil animals and plants

poacher: a person who hunts or catches game animals or fish illegally

primatologist: a scientist who studies Primates like chimpanzees, gorillas, or orangutans

protégé: a person who is guided and supported by an older and more experienced or influential person

rehabilitation: the act of restoring an animal (human, primate, etc.) to health or normal life

theory: a system of ideas that explains a phenomenon, based on general principles and the accumulation of evidence and experimental results; in science, theories are explanations that, to the best of our knowledge, are true (compare with hypothesis)

trailblazer: a person who makes a new track through wild country

ADDITIONAL RESOURCES

The Jane Goodall Institute

www.janegoodall.org

The Dian Fossey Gorilla Fund International

www.gorillafund.org

The Orangutan Foundation International

www.orangutan.org



TEACHING

Primates is a graphic novel about primates, primatology, and what its like to be a scientist heading out into uncharted territory, both literally and figuratively. So the opportunities to teach from it range from talking about primates to discussing the process of creating narrative non-fiction, and perhaps even narrative non-fiction comics!

You can supplement units on primatology with selected passages from the book talking about the importance of extended observation, recording field notes, and data gathering from the straightforward (those careful observations) to the more hands on such as analyzing droppings . . . which is appropriately gross, but a great example of the special way scientists think about sources of information; they're everywhere! A discussion on techniques a scientist might use to gather data about their own behavior can lead students to consider the trail of data and behavioral clues they leave behind without even thinking about it, which might in turn take them down a path towards discussing questions of scientific ethics with regards to doing research on any animal, from lab rats to humans.

Conservation of both wildlife and habitat is an important theme of the book, and the different approaches taken by the three main characters both point out the many ways this can be done and the controversies and challenges these approaches create. Jane Goodall is active in animal rights, and has lent her name to habitat preservation and wildlife conservation. Students can contrast her gentle and steady approach to the one taken by Dian Fossey. Fossey was aggressive and confrontational in the face of poachers and indifferent government officials. She was effective, but she also paid a high price—the highest—because of the enemies she made. A conversation about what she could have done differently, given her situation, would raise many thought-provoking ideas. Biruté Galdikas was a pioneer in what we now call eco-tourism, as well as in rehabilitating orangutans and reintroducing them into the jungle. She had to become a diplomat as well as a scientist to do so, and some primatologists question whether she is as effective as she could be. But here again, it's worthwhile to consider what other options she might have. Could she have had as much of an impact if she hadn't adopted the rain forest as her home and orangutans as something close to her children?

Finally, *Primates* is of course a graphic novel; a true story (with some fictionalized elements) told using comics. So students must engage not only the words, but also the pictures . . . and how they complement and sometimes provide counterpoint to the words. Pages are built of panels, the gaps between those panels often represent a passage of time, and the panels themselves combine words and pictures. (Unless they're silent, of course!) Discussing why certain pages (page 20) or panels (page 71, panel 1) are silent can help readers understand storytelling choices. Narrative, graphic non-fiction demands that readers absorb and understand how the pages and scenes are structured to emphasize key points. You can also discuss how information is presented (in the words of the Common Core standards, "sequentially, comparatively, causally"), and by noting things as simple as the choice of color you can talk about what points of view we wanted to emphasize and what we consider most important in the story.

PRIMATES DISCUSSION QUESTIONS

1. What do you think of Jane Goodall's decision to leave bananas out for the chimps (pages 31-34), and Louis Leakey's criticisms of her doing so?
2. Dian Fossey started out with romantic notions of her life in the mountains (pages 50-51) but reality turned out different. She ended up constantly battling poachers. Do you think she was right to do that?
3. Camp Leakey is both the base of operations for research and for Biruté Galdikas' rehabilitation efforts (pages 91-94). Which do you think is more important, research or rehabilitation, and why?
4. To paraphrase Julius Caesar—by way of Biruté Galdikas!—all three scientist “came, saw, and stayed” (page 123-125). The scientific and personal rewards were great, but they also made sacrifices. Was it worth it? Would you do it?
5. We've learned a lot about primates because of Drs. Goodall, Fossey, and Galdikas. We've also learned a great deal about ourselves as a result. What animals do you think would make good subjects for long-term study, and what hypotheses would you have in mind when you started your research?
6. How would you describe Maris Wicks' artistic style? What is its most striking feature, and why do you think it works for this story?
7. What section or scene do you find most effective? Why? Be as specific as you can.
8. How would you describe the tone of the book? Cite specific pages and/or panels as examples.
9. Choose a page in the book and describe how the writer and artist combined words and pictures in effective ways.
10. Which characters do you find to be the most interesting and engaging? That may be different than most memorable! Why? Which would you like to go on a vacation with? Which would you want to invite over for dinner?!

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DID THEY REALLY SAY THAT? DID THAT REALLY HAPPEN?

You might wonder how much of what you read is really what our heroes said, and whether they did what we showed them doing. So, here's an example of how we adapted dialogue from two letters written by Jane Goodall to her family, from the camp she called Chimpland, and how we wove parts of them into the story. You can find the original letters and many more in *Africa in My Blood*, one of the books we recommend at the end of *Primates*.

Let's start with a paragraph from a letter dated (probably? Dale Peterson, the book's editor, isn't certain) September 19, 1960. The underlined text is in the original . . . the italics highlight what we used:

"It's quite cold up on the mountains at dawn, now. An icy wind sweeps over the peaks, & one longs for the clouds to be swept away from the sun. Then, at 12 when the sun is hottest, the wind stops altogether & one nearly dies of heat! *I am rapidly becoming like a piece of tough brown leather. Even when I slip down a few yards of shale, I find the skin on hands, elbows, legs, etc. is not broken. It's rather a hoot!* Today is my day for doing paper work—the 1st for 2 weeks when I have not been out. It feels very strange to be staying in camp all day but there is such a lot to do."

Now, have a look at the dialogue on page 15 of *Primates* . . .



Page 15, panel 1: *I am rapidly becoming like a piece of tough brown leather.*

Page 15, panel 2: *Even when I slip down a few yards of shale, I find the skin on my hands, elbows, legs, etc. is unbroken.*

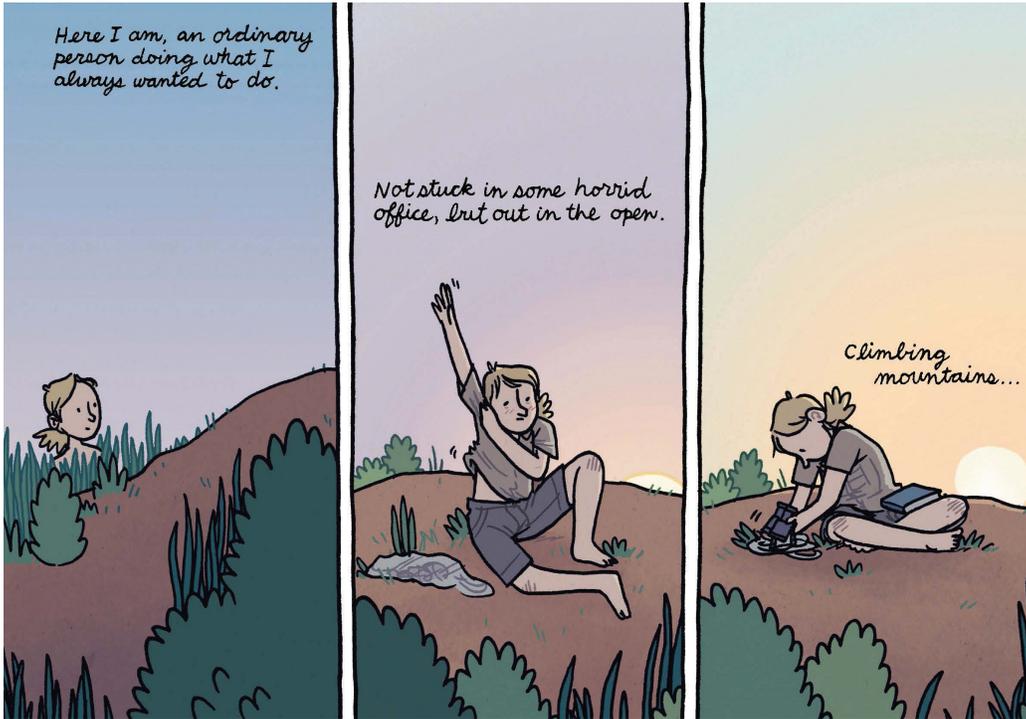
Page 15, panel 3: *It's rather a hoot!*

Why the changes? First, I broke sentences up and spread them across different panels to try and create a rhythm and an interplay between the words and the pictures that Maris would soon draw. We don't want her slipping in more than one panel, and we can't jam all those words into a single panel, either. And because space is always at a premium in comics, minor changes like going from "is not broken" [13 characters] to "is unbroken" [11 characters] get made. Over the course of a whole book, those extra characters add up!

Now, from another letter, this one dated September 25, 1960:

“Another part of my job is messing around in dung, under their nests, to see what they’ve been eating! What a life, eh! Sometimes it suddenly comes over me how strange it all is, really. Here I am, an ordinary person, with my staff of 3, a camp, unlimited funds, and doing what I have always wanted to do. *Not stuck away in some horrid office, out of the sunlight, but out in the open, sleeping under the stars, climbing the mountains, watching the animals. Is it possible? Can it really be me? Or is it some strange hallucination?* The only sad part is that it’s so far away from all of you.

I broke that apart so it became . . .



Page 15, panel 5: *Not stuck in some horrid office, but out in the open.*

Page 15, panel 6: *Climbing mountains . . .*

Page 16: *Watching animals.*





Page 22, panel 3: *Is it possible? Can it really be me, here, now?*



Page 22, panel 4: *Or is it some strange hallucination? . . . No. It's me.*

Again, pacing is important here, because I know page 16 will be a full page illustration—what comics creators call a “splash”—and we want to use the fewest possible words with the greatest possible impact there.

[Notice that on page 16 Jane doesn't actually see any animals, but you, the reader, do see one: a human! All of a sudden you're in Jane's shoes; we hope that made you feel what she was feeling.]

We then see her make her groundbreaking discovery, let her come back down off The Peak, and do some late-night writing in Chimpland. And you probably noticed that instead of removing words, I added some: “here, now?” and “. . . No, it's me.” I did this to heighten the immediacy of what she's writing. No question that it's artistic license, but I hope you agree that it's in the right voice, and it highlights what she's feeling as she writes that letter.

What about pages 17-21? Did her discovery happen between the 19th and 25th of September? No. George Schaller visited the next month, in October, and she first recorded observing tool use in her journal on November 4 of that year. So I clearly shifted things around by a couple of months.

So, is this non-fiction? Your answer will depend on how worried you are about the late-September to early-November 1960 chronology being in exactly the right order. But I would say yes . . . or at least it's 96% non-fiction [see page 24 of *Primates!*], because it's what happened and what she said . . . edited for clarity and impact.

I could go on, but you get the idea . . . repeat this process scene after scene for two more scientists and 133 pages and you end up with *Primates!*

Activity: Grab a copy of one of the books in our bibliography and try your hand at creating a scene out of a first-hand account. What would you keep? What would you cut? How might you combine events that happened at different times while staying true to the spirit of how it really happened.

p.s. Because you probably wondered about this too, walking the path without clothes and carrying them in a plastic [“polyethylene”] bag comes from letters postmarked February 6, 1961 and April 25, 1963.