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## BOOKS

### YOUTH NONFICTION: Inspiring Experiences in Science

Susan Kovats\*

#### **Gorilla Mountain**

The Story of Wildlife Biologist Amy Vedder

*Rene Ebersole*

Franklin Watts (Scholastic), New York, and Joseph Henry (National Academies Press), Washington, DC, 2005. 128 pp. \$9.95. ISBN 9780309095518.

#### **Robo World**

The Story of Robot Designer Cynthia Breazeal

*Jordan D. Brown*

Franklin Watts (Scholastic), New York, and Joseph Henry (National Academies Press), Washington, DC, 2005. 128 pp. \$9.95. ISBN 9780309095563.

#### **Nature's Machines**

The Story of Biomechanist Mimi Koehl

*Deborah Parks*

Franklin Watts (Scholastic), New York, and Joseph Henry (National Academies Press), Washington, DC, 2005. 128 pp. \$9.95. ISBN 9780309095594.

Mimi Koehl's "I had to know the answer!" sums up the dedication, effort, and excitement that the women scientists featured in *Gorilla Mountain*, *Robo World*, and *Nature's Machines* (respectively, Amy Vedder, Cynthia Breazeal, and Mimi Koehl) bring to their research projects. The three titles are part of the outstanding ten-book series

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Women's Adventures in Sciences, underwritten by the U.S. National Academy of Sciences, which features the lives and research areas of contemporary women scientists (1).

Suggestions for Your Summer Reading Enjoyment



Engaging, inspiring, and informative, the books describe the childhood, scientific training, research topics and careers, and personal family lives of the scientists. Although written for middle school and secondary students, the books may be read at multiple levels. Thus they should appeal to the intended audience, and they are also likely to capture the attention of younger children and adults. Photographs, which appear on nearly every page, depict research materials and equipment; laboratories or field locations; scientists working; and families, mentors, or colleagues. These pictures both personalize the stories and show how the research is actually accomplished. Boxed inserts such as "Gorilla speak," "Recipe for a robot," and "Flight in a tunnel" provide facts about the science and technology, allowing readers to more fully understand the scientists' research goals. The authors (each experienced in writing about science for children) make complex topics of wildlife conservation, robotics, and biomechanics interesting and accessible--when a research question is posed, the reader will want to know the answer as well.



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The books present compelling, attractive pictures of the scientists' personal and highly successful professional experiences. Because the whole of the scientists' lives are presented, young girls (and boys) will easily imagine translating their interests and skills (animals, sports, art, nature, school, etc.) into a scientific career. Vedder and Breazeal excelled at sports, and they each recalled how the team spirit and hard work inherent in athletics served them well when they needed to overcome obstacles and study hard during their scientific training. To determine how features such as bent knees and large webbed feet help tropical frogs fly, Koehl used her artistic talent to build models of frogs that allowed her to measure the physical effects of these design

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features.

In the inset on the ways gorillas communicate, Ebersole quotes Vedder's comment, "When gorillas 'sing', it can be like us humming in the shower. They're saying, 'hey, life is great!'" Vedder began her career in wildlife conservation at the Karisoke Research Center in Volcanoes National Park in Rwanda. She had resolved to help save the mountain gorillas from poaching and a dwindling habitat by learning more about the relationship between the gorillas and their forest environment. She tracked and observed gorillas from sunrise to sunset, recording diet and activities, learning that gorillas preferred to live in areas that contained a high variety of foods, and ultimately winning the confidence of several gorilla family groups. In one instance, Vedder and her husband Bill Weber hiked 16 hours, over the volcanoes spanning the border of Congo and Rwanda, carrying a young gorilla injured by a trapper's snare back to the research center. There, they cared for the frail ape, even performing cardiopulmonary resuscitation in an ultimately unsuccessful attempt to save its life so that it could be returned to the wild.

One lasting legacy of Vedder's work is the Mountain Gorilla Project, a conservation program that she and her husband proposed to the Rwandan government. When it was implemented in 1979, the project supported antipoaching teams, education about value of wildlife and natural resources, and gorilla tourism that brought jobs and foreign money to the country.

To study how people would interact with her emotionally responsive robot Kismet, Breazeal gave them the simple instruction "Speak to the robot." Breazeal began her career in robotics in Massachusetts Institute of Technology's Artificial Intelligence Laboratory, where she learned how to construct autonomous robots, machines that are programmed to function independently and make decisions on their own. For her own research, she constructed an emotionally expressive, socially intelligent robot that could respond to humans by conveying the spectrum of human emotions. She used 15 computers to control Kismet's expression of surprise, tiredness, happiness, sadness, or anger based on its fulfillment of "drives" such as the desire to interact with people, to play with brightly colored toys, or to rest after too much stimulation. Breazeal later collaborated with Stan Winston, the award-winning creator of robotic characters for Hollywood movies. Working together, their groups designed and constructed the autonomous robot Leonardo, a furry animal robot with the ability to see, hear, touch, and emotionally respond to people based on its prior interactions with them. Breazeal's ultimate goal is to develop robots that can cooperate with people as partners, by providing both service and companionship.

Discussing her discovery of how differences in the mechanical behavior of their tissues allow calm-water and wave-tossed anemones to feed by different techniques, Koehl declares, "I got really excited by my findings." "I like to know how organisms work." Koehl's research lies in biomechanics, a field in which the laws of physics are used to study how living organisms function in their environments. During her graduate studies in marine zoology, Koehl traveled to the Pacific coast of Washington state, where she studied the physical parameters that enable sea anemones to cling to the ocean bottom amid the crashing waves of a rugged coastline. Over the years, field investigations and experiments took her to remote coasts, where she often constructed her own equipment and waded into the turbulent tidal ecosystems to measure physical forces on the living "machines" she studied. Among her subsequent investigations that are discussed in the book is how specific design features (hairy or smooth) of noses or antennae are optimized to catch odor molecules swirling in currents. Koehl continues to devise creative techniques to understand how certain

body designs allow organisms to eat and move in their particular environments.

One theme shared by the books, and the series as a whole, is reflected in advice that Koehl offers when talking to kids: "Every person has some gift or talent that can help unlock new answers about the world in which we live.... So don't be afraid of science, but do tackle it the way you do best."

## References and Notes

1. The scientific adventures of the 10 researchers are also showcased at a Web site that draws on the biographies, [www.iwaswondering.org](http://www.iwaswondering.org).

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