

# Moth and Wasp, Soil and Ocean

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Illustrations by Melanie Linden Chan

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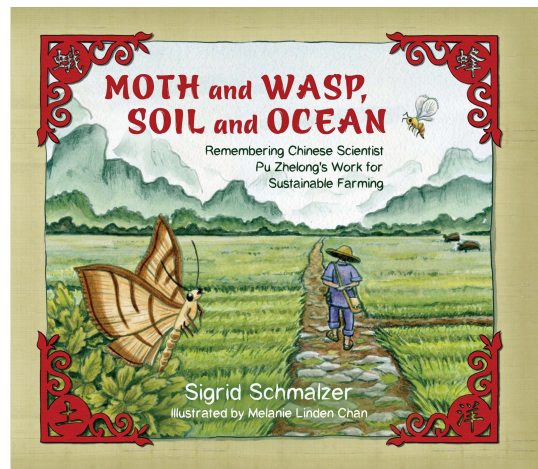
10 X 9, 40 pages, Color throughout

Ages 8-12

Picture Book/History

## Summary

*"The first time I saw a scientist in my village was also the first time I saw a wasp hatch out of a moth's egg," writes the narrator of this picture book about Chinese scientist Pu Zhelong. "In that moment, I could not have said which was the more unexpected—or the more miraculous."*



While Rachel Carson was writing and defending *Silent Spring* in the U.S. in the 1960s, a soft-spoken scientist named Pu Zhelong was teaching farmers in Communist China how to forgo pesticides and instead use parasitic wasps to control the moths and other insects that were decimating crops in the world's most populous country. Professor Pu's work brought together the concepts of "soil" – which meant local, rural, humble, and Chinese – and "ocean" – which meant foreign, modern, elite, and Western. The Chinese government required all science to be rooted in the soil.

Though little known in the West, Pu Zhelong should be celebrated worldwide as a pioneering environmentalist. This story told through the memories of a farm boy (a composite of people Pu Zhelong inspired) weaves a rich tapestry from strands of Chinese culture, the natural history of insects, and the global effort to develop sustainable agriculture.

This book will lead to discussions about

- Best farming practices
- The effects of pesticides
- Chinese history and culture
- Different ways of thinking about scientific research
- How scientists contribute to society

## Before You Read

### Access Prior Knowledge

- What other scientists do you know about? Have you read about other scientists who have made important contributions to the environment? (Examples: Rachel Carson, Wangari Maathai)
- How do insect pests harm agricultural crops?
- Find China on a map of the world. Where is China in relation to where you live? Do you have family or friends in China?
- What are the most important agricultural crops in China? How is this different in the south (where this story takes place) and the north?
- What are some of the ways other insects (e.g., bees, lady bugs, and parasitic wasps) help farmers?
- What are some of the different ways of controlling insect pests?
- What environmental and health problems do chemical pesticides cause?

## After You Read

### Discussion Questions

- What challenges has China faced in feeding its people and protecting the environment? How have people tried to solve those problems?
- What happened to Chinese farming after people started using chemical pesticides?
- How do insect pests become "resistant" to chemical pesticides, and what problems does this cause?
- How did Pu Zhelong explain the relationship between farming and ecology (the relationships among different plants and animals)?
- Why was the knowledge of young people like the narrator of this story so important for Chinese villages?
- How do the narrator and other villagers feel about science? What opportunities does the narrator have to participate in scientific work?

- What does "soil and ocean" mean in the book? How did this relate to the way Pu Zhelong did his scientific work? What aspects of his work were "soil," and which were "ocean"?
- After reading "The History behind the Story" (at the back of the book), what do you think of the way that the Communist government treated scientists?

### For Further Discussion

- How was Pu Zhelong similar to or different from other scientists you have read about?
- Do you think scientists should work with farmers and other community members to solve problems?  
What are the possible advantages when science combines "soil" and "ocean"?  
Or  
Should scientists work alone to find their own research solutions?  
What are the possible advantages when scientists work independently?
- Have you or your friends ever participated in agricultural science (for example, through 4-H) or scientific research (for example, in science fairs)? How are those experiences similar to or different from what the book's narrator experienced?
- The world still has not solved the problems of feeding all its people while protecting the environment we all share. What can scientists, farmers, activists, and young people across the globe do? How can we work together?

### Activities

#### 1) Traditional Chinese paper cutting

On the borders of many pages of this book, you can find examples of Melanie Chan's beautiful paper cutting art. Paper cutting is a traditional folk art in China that was popular in Pu Zhelong's time and remains popular today. Numerous web sites provide instructions on how to create your own paper cuttings. We especially recommend Sharon Qian's instructional videos on Youtube. See, for example, this video on how to cut a butterfly: <https://youtu.be/WkwPTP-k2Kw>

#### 2) Write about the life of another scientist

Look for books about another scientist. (Teachers and librarians can help!) Construct a timeline of their life, their contributions to society, and the ways in which they were similar to or different from Pu Zhelong. Another option is to write a short story about the scientist from the perspective of a fictional character--just like this book!

3) Learn about farming and insects

Visit a local garden or farm and ask the gardeners or farmers about the different kinds of insects that eat the plants--and those that protect them. Parasitic wasps are small and hard to find, but you may well encounter another helpful insect that eats pests: ladybugs! If your school has a garden, ask your teacher if you can purchase parasitic wasps or ladybugs to release there. You can buy batches on line for as little as \$10 or \$15.

4) Write about your own life in science

Write a story about your own participation in science. These can be real experiences or invented. How would you imagine the ending (when you are grown up)?

5) Learn to write a Chinese character

This book includes many examples of Chinese writing, called characters. Which is your favorite Chinese character shown in the book? Define it and write it on a poster for the wall in your home or classroom.