

2 *The Lives of a Cell*

Notes of a Biology Watcher

—*Lewis Thomas*

Synopsis

Lewis Thomas's essays are a combination of science and lyricism. He stresses the interconnectedness of life, celebrating the beauty and poetry inherent in science. To him, paradoxes inspire awe, rather than causing worry. From ants to the atmosphere, Thomas observes the things that seemingly very different organisms, events, and humans have in common.

In these essays, Thomas provides us with a wealth of scientific information, coupled with philosophical wonderings and sometimes whimsical, profound insights. Each of the 29 essays deals with Thomas's thoughts and theories about different aspects of science and their impact on and implications for our lives.

Student Focus

You should pay close attention to the interplay between the information provided in each essay and the observations and conclusions drawn by Thomas. These pieces are written to make the reader think about what the author is saying and also to think on his or her own. Debate the different aspects of each issue with yourself as you read in order to arrive at a conclusion that is your own.

As you read, you should be carrying on an internal dialogue with the author. Do you agree or disagree with the conclusions drawn? What are your own thoughts on each subject? Do you reach the same conclusions as the author or does the information given lead you in another direction? Keep a log of your thoughts as you read each essay. When you have finished reading the book, examine your log to see if you have changed your ideas about any of the topics. The essays are short, but they contain a world of thought for you to take part in.

Correlation to Subject Matter

Genetics, Bio linguistics, Viruses, Symbiosis, Entomology, Astronomy, Technology, Mitochondria, and Sociology

Analyzing the Essays

Identifying
Facts,
Interpreting
and
Applying
Meanings

Lives of a Cell

1. What are mitochondria? What relationship do we have with them?

On Societies As Organisms

2. How does the quote from Ziman's essay relate to "the building of a termite nest"? Use information from Thomas's essay.

The Music of This Sphere

3. Discuss Thomas's theory of the function of music. Do you agree or disagree? Discuss your reasons.

An Earnest Proposal

4. What is Thomas's underlying message? Does he really think learning everything about *Myxotricha paradoxa* would be simple?

5. List at least ten questions that you would like answered about a simple organism.

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Ceti

6. What are the conditions necessary for life to begin? What are the steps in the process?

7. Discuss the pros and cons of searching for extraterrestrial life.

8. If you were to send such a recording today, what would you include? Keep in mind the points brought up in the essay. How would you defend your selections to a panel of judges?

Antaeus in Manhattan

9. At what point in the essay does Thomas first make a comparison between the ant colony and people? How is this comparison made?

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10. How are colonies of social insects, such as ants and termites, and human communities alike? What are the fundamental differences?

Organelles as Organisms

11. What is it about mitochondria and chloroplasts that make them "... in a fundamental sense, the most important living things on earth"?

Germ

12. "The man who catches a meningococcus is in considerable less danger for his life, even without chemotherapy, than meningococci with the bad luck to catch a man." What does Thomas mean by this statement?

13. Is Thomas drawing social parallels in this essay? Explain.

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Death in the Open

14. What would be the results of death in the open?

Natural Science

15. How does this view of science and scientists compare with the more traditional view of cold, sterile laboratories occupied by detached people in white coats? Which view generates more excitement about science and research?

The Planning of Science

16. Discuss the differences between basic research and applied science.

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17. "The surprise can be because it did turn out as predicted . . . , or it can be confoundment because the prediction was wrong and something totally unexpected turned up, changing the look of the problem and requiring a new kind of protocol. Either way, you win." What does Thomas mean by "Either way, you win"?

On Various Words

18. What does Thomas have to say about the similarities between the activities of ants and human language development?

19. "We have DNA for grammar, neurons for syntax." What does Thomas mean by this?

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20. Would it help or hinder communication if everyone knew the history of all the words they used?

On Probability and Possibility

21. What does Thomas mean by mutants? Who would be some of those mutants, and why would they qualify?

22. What does Thomas mean by "... the Art of Fugue and the St. Matthew Passion were, for the evolving organism of human thought, feathered wings, opposing thumbs, new layers of frontal cortex"?

23. "What we need is more crowding, more unrestrained and obsessive communication, more open channels, even more noise, and a bit more luck." Do you agree or disagree? Explain your reasoning and how it differs from or supports Thomas's point.

Writing About the Essays

On a separate sheet of paper, write the answers to each of the following.

Extending the Essays

1. Choose one of the essay titles, and write your own observations and questions on that topic.

Thinking About Assumptions

2. Does the fact that these essays were written over twenty years ago make the ideas outdated? If some theories have been disputed or disproved, does that diminish the thoughts expressed and questions asked? Explain the reasoning behind your answer.

Responding To a Review

3. Joyce Carol Oates said of this book "...*The Lives of a Cell* anticipates the kind of writing that will appear more and more frequently, as scientists take on the language of poetry in order to communicate human truths too mysterious for old-fashioned common sense..." Do you think that the understandings of science that Thomas is trying to share could be communicated as well if they were in a less poetic, more prosaic fashion? Why, or why not?

Evaluating a Character

4. Bach shows up in four of these essays. What is it about this particular composer that makes him so prominent in a book of science essays?

Writing a Journal Entry

5. You are the extraterrestrial Visitor mentioned in *The Music of This Sphere*. Write a journal entry explaining how this book of essays has helped you to better understand the human population.

Analyzing the Style

6. Is an essay the appropriate form for the thoughts and ideas Thomas is trying to convey? Would a different form, such as the novel, short story, or journal article, be more effective?

Testing on the Book

On a separate sheet of paper, write the answers to each of the following.

Critical Thinking and Writing

1. In 1972 and 1973 the Pioneer probes were sent into space with information about us. Included were pictures of a man and woman, a diagram of our solar system, and a diagram showing the placement of our solar system in the galaxy. In 1977 the Voyager probes were sent into space with more information. Included were, among other things, recordings of Bach's music. Would knowledge of this have changed Thomas's essay "Ceti"? In what way?
2. In the essay "Organelles as Organisms," Thomas talks about our symbiosis with mitochondria. What kind of "natural law" could you draw from the "sense of life alluded to by chloroplasts and mitochondria"?
3. In his essay "Information," Thomas ends by stating, "The great thing about human language is that it prevents us from sticking to the matter at hand." What does he mean by this?
4. Is there a common thread running through all of Thomas's essays? What is it? Give examples from different essays.
5. Write your own review of Thomas's book. Include examples of new information you have learned and ideas that intrigued you, as well as examples and discussions of things you disagreed with and why.

