Book Reviews

Pythagorean Crimes

Reviewed by Dan Kalman
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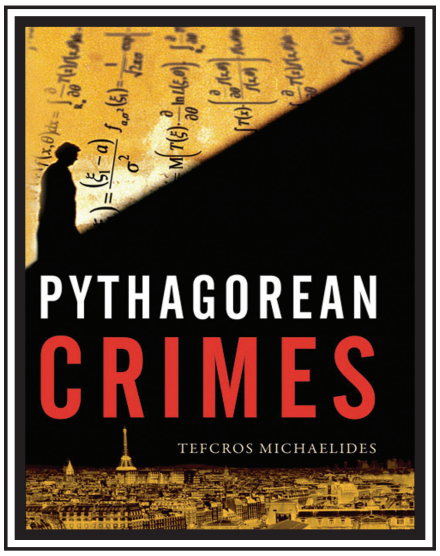
In 1900, the Second International Congress of Mathematicians convened in Paris. Mathematical superstar David Hilbert delivered an address entitled, "The Problems of Mathematics in the Future" ("Sur les problèmes futures des mathématiques"), describing ten open problems that he considered to be of central importance. The written version of the address included additional problems, for a total of 23 in all.

All of this is well known in the history of mathematics. Participating in the solution of one of Hilbert's problems is a singular entry in a mathematician's resume, and becomes part of his or her pedigree. Thus, for example, Matiyasevich will always be known for solving Hilbert's 10th problem, and Davis, Putnam, and Robinson will be remembered for laying the foundations for Matiyasevich's work. Some of Hilbert's problems remain unsolved to this day, including the famous Riemann Hypothesis, considered by many to be one of the most important open questions in mathematics.

Hilbert's problems are so famous they are nearly inescapable. College math majors are almost certain to at least have heard of Hilbert, his problems, and a little of the history by the time they graduate. In the same way, they have heard of many of the most famous mathematicians of the same era, including Poincare, Russell, Peano, and Gödel, and they likely also recognize the major trends that shaped mathematics at dawn of the twentieth century. So dramatic a period of development and so notable a cast of characters provides an ideal setting for a work of historical fiction. *Pythagorean Crimes*, written by Tefcros Michaelides and translated into English by Lena Cavanagh, is just such a work.

Nominally a murder mystery, the book derives much of its richness and charm from the way it brings to life the personalities and events of the early twentieth century. The narrator, Michael Igerinos, is a successful Greek business man and amateur mathematician. As the story opens in 1930, his best friend, Stefanos Kandartzis, has been found dead. The police interview Igerinos, who is apparently the last person to have seen Kandartzis alive. Describing his relationship with Kandartzis throws Igerinos into a reverie, suddenly transporting the reader to Paris in 1900, just in time to hear Hilbert deliver his famous address. We follow Igerinos as he moves through the world of mathematics and the larger Parisian society, meeting notables (including Pablo Picasso), hearing and spreading gossip. In addition, there are brief interludes concerning a mathematical and philosophical crises in the school of Pythagoras. This gives the novel its title, and sets up a historical and psychological theme with ramifications for the main story line.

How accurate are the characterizations of historical figures? It is hard to know. The author tells us in an afterword that "All the historical, geographical, and technical details are accurate, at least insofar as the bibliographical sources consulted are accurate. The imaginary characters meet and interact with real personalities of the past. All information connected with such figures is based on reliable sources" with a couple of exceptions that he takes pains to detail. So the accounts of meetings and discussions are probably correct. But what about the personalities? Part of the book's appeal is the way it brings historical figures to life. It is very entertaining. I don't know whether it is historically accurate.



***Pythagorean Crimes*, written by Tefcros Michaelides and translated into English by Lean Cavanagh. Published by Parmenides Publishing. ISBN 978-1-930972-27-8. List: $14.95.**

The more you know about mathematics and its history, the more you will enjoy this book. Famous mathematical names and developments pop up all over the place, with many a digression to discuss the mathematical ideas involved. Even if you don't recognize the names, you will be able to follow the mathematical digressions. Moreover, the author puts mathematical developments into a broader historical context. For example, in the discussion of Hilbert's address we learn about a German philosopher named du Bois-Reymond, whose "central thesis was summed up by the phrase *'Ignoramus et ignorabimus'* ('We know nothing and we shall continue to know nothing')." The point of this quotation is to highlight a belief in the inherent limitations of humanity's capacity to

understand the workings of nature. Hilbert reportedly rejected this position, stating in the 1900 address that "in mathematics there is no 'ignorabimus'." He stated it more forcefully still in an address in 1930, with the ringing declaration that became his epitaph: "We must know. We shall know." Michaelides does a fine job of explaining the cultural current propagated by du Bois-Reymond, and how Hilbert's address of 1900 was, in part, a reaction to it. (For a wonderful account of Hilbert's life, see the biography by Constance Reid.)

Judged solely within the genre of the murder mystery, *Pythagorean Crimes* has significant flaws. The story is narrated in the first person, providing a retrospective view of events in the narrator's past. In the process, critical information is withheld from the reader in order to increase suspense, and indeed, to prolong the mystery. For example, one scene recounts a meeting between the narrator and an antagonist. The narrator says, "I heard him out. I felt turmoil inside, but still kept my cool. 'Very well,' I answered in an expressionless voice, when he had finished. 'We shall see who is right.'" But the reader is left completely in the dark about what has actually been said. This is a violation of the conventions of mystery fiction —the reader is supposed to have the same information as the protagonist, and the same opportunity to solve the mystery. On balance, I recommend this as an entertaining and interesting tale for readers with a mathematical bent. Its flaws as a mystery novel are more than compensated for by the pleasure of meeting famous mathematicians in realistic and historical settings. While you might solve the mystery well before the climax, you will be entertained and enlightened by the mathematical ideas and figures who weave in and out of the story.

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or community college, where the great majority of American college students are found.

This is disappointing, but understandable. At Potsdam, Stephens had to persist for years in order to win his whole faculty over to his point of view: "Under favorable conditions, any college student interested in learning mathematics can be successful!"

And what are favorable conditions?
"Students come first."
"Give a student all the time he or she needs to absorb the material."
"Have complete confidence that every student can be successful."

At Potsdam, faculty are not under constant pressure to publish as many research papers as possible. And mathematics is there for any student who is interested in learning it—not only future scientists and engineers. After graduation, many of the math majors at Potsdam become math teachers. Many others go to work in business or other non-academic careers but still find that their mathematics education is useful in their life.

It would be quite a project to convert an ordinary state university in the U.S. to the Stephens philosophy. Faculty are to be rewarded for putting students first? And any student who is interested in mathematics will succeed? And each student of mathematics feels loved? However, here is one consideration that might move faculty and administrators to pay attention to the Potsdam Model. Many U.S. universities are struggling to increase the success rate of minority students in mathematics. At any school where the Potsdam Model were implemented, one would confidently expect great improvements in the success rates of all students—both minority and majority.

Further Reading

Dilip Datta. *Math Education at its Best: The Potsdam Model*. Center for Teaching/Learning of Mathematics, Framingham MA., 1993.

James Donaldson. "Black Americans in Mathematics," from *A Century of Mathematics in America Part III*, American Mathematical Society, 1989.

Robert Megginson. "Yueh-Gin Gung and Dr. Charles Y. Hu Award to Clarence F. Stephens for Distinguished Service to Mathematics," *The American Mathematical Monthly*, Vol. 110, No.3 (2003), pp. 177-180.

John Parker. *R.L. Moore. Mathematician and Teacher*. The Mathematical Association of America, Washington DC, 2004.

John Poland. "A Modern Fairy Tale?" *The American Mathematical Monthly*. Vol. 94, No. 3 (1987) pp. 291-295.

About the author: *Reuben Hersh is the distinguished author of numerous articles and books including,* The Mathematical Experience *(with Philip Davis), which won the National Book Award in 1983. This article is an adapted excerpt from his forthcoming book, Loving and Hating Mathematics—Challenging the Myths of Mathematical Life, co-authored with Vera John-Steiner, Princeton University Press. Reuben Hersh is currently Professor Emeritus at the University of New Mexico.*

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