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Reviews

Tefcros Michaelides, *Pythagorean crimes*, Parmenides Publishing, 2008, 272 pp, £9.95/£22.50 ISBN 978 1 93097 227 8

The discovery of the incommensurability of the diagonal and side of the square supposedly shook the foundations of Pythagorean philosophy, the implications being so serious that the closed circle of Pythagoreans were sworn to silence (though David Fowler could find no evidence to support this oft repeated story: see *The mathematics of Plato's academy,* second edition, 1999). Michael Igerinos, the hero of *Pythagorean crimes,* in a statement to the police, repeats the even more colourful story that, according to tradition, it was Hippassus of Metapontum who dared to expose this dreadful secret of irrational numbers and was murdered for his impiety. 'It was the first Pythagorean crime in history' adds Igerinos. Tefcros Michaelides uses the Hippassus story as a leitmotif for his own tale of a mathematical crime. Could there be another discovery in mathematics so dreadful as to warrant a murder in order to preserve the character and purity of mathematical endeavour?

Like all good detective stories, the novel begins with the discovery of a body. We suspect murder but it is the motive that intrigues. We are taken back some 25 years to the second International Congress of Mathematicians in Paris in 1900. Igerinos, from a wealthy Greek family has come from Göttingen where he was a student. While waiting for Hilbert to deliver his keynote lecture on the future of mathematics, Igerinos meets Stefanos Kandartzis, who is studying in Paris. The two survey the gathering group of mathematicians filling the room, exchanging information on their achievements and current work as well as tasty gossip. The two young men become friends and their separate, and often overlapping, lives constitute the shape of the novel.

Igerinos, with all the advantages of wealth and family connections leads a charmed life but is forced to abandon his mathematical studies in favour of the family business. Kandartzis, unable to obtain a university post in Athens after his return from Paris, earns a poor living as a secondary school teacher and devotes what time he can to his passion, attempting to solve Hilbert's second problem. The difference between the two young men is this: if mathematics could be reduced to a sequence of routine algorithms it would be a breakthrough to finding new results (Kandartzis); however, such a discovery would destroy the very nature of mathematics itself (Igerinos).

Michaelides has provided us with a multi-layered tale. Our heroes find themselves in Paris at the time of major changes in politics and arts. They visit the Moulin Rouge (was Hilbert really there being entertained by dancing girls?) and meet up with the younger artists living in Montmartre, Picasso included. They talk mathematics among themselves and discuss geometry with artists. Igerinos, after his return to Athens, is caught up in the turbulent times of Venizelos's attempt to reorganize Greek society and his conflict with the Royalists. There is also romance and dealing with underworld criminals to entertain the reader. The whole book is great fun and should appeal to any reader of the *Bulletin*.

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Explaining mathematics through the medium of a story has its problems. How much can we assume the reader knows? The author uses dialogue between his characters and this is generally successful, particularly where we have mathematicians explaining ideas to artists. It is a bit less successful when the two heroes are ostensibly explaining things to each other, but clearly for the benefit of the reader. What is impressive is the large number of mathematicians whose work is referred to or explained (I counted over forty).

This is an English (US) translation of the original Greek and the publishers have thoughtfully added an extensive glossary (30 pages) of notes that were not in the original. The notes about politicians and political events are particularly helpful and the translation is excellent.

Chris Weeks

Arturo Sangalli, *Pythagoras' revenge: a mathematical mystery*, Princeton University Press, 2009, 183 pp, £16.95, ISBN 978 0 691 04955 7

Hot on the heels of Tefcros Michelides's *Pythagorean crimes* (see above), a novel about the crises in mathematics in the first half of the twentieth century which is promoted with the strap-line 'Math kills', we have this thriller about a twenty-first-century Pythagorean sect seeking the reincarnation of their hero. Its back cover presents enthusiastic quotes from a range of readers: no less a figure than Gregory Chaitin describes it as 'A page turner! A serious work on the philosophy of mathematics disguised as a mystery novel that would make a terrific motion picture!'

I'm sorry to be less enthusiastic. The story-line contrasts the Pythagorean view of number as the key to the universe with recent mathematical results about randomness. These are important ideas but, for me, the mathematics needed more detail to communicate its significance or its relevance to the plot. There are five mathematical appendices presenting topics such as Pythagoras' Theorem (with a familiar visual proof) and Euclid's proof that there are infinitely many primes. These are presumably intended for the non-specialist reader, whom I suspect however will not make much of the brief note on random sequences which comes between them. The history underlying the story is superficial while the characters are insufficiently developed to make their motivations and behaviour plausible. Although this was a mildly entertaining read, I found it impossible to take the plot seriously or to care what happened to the characters.

I welcome the brave attempt to explore deep and important mathematical ideas in this popular format, but sadly I don't think it quite comes off. I feel the novel is too blatant in its attempt to be the next *Da Vinci code*. I can imagine that, as Chaitin suggests, it might work well as a film, which could rival *Fermat's room* as a piece of hokum with enough mathematical interest to become a cult success. But in its present form ultimately it fails to satisfy me either as fiction or as an exploration of mathematical ideas.

Tony Mann