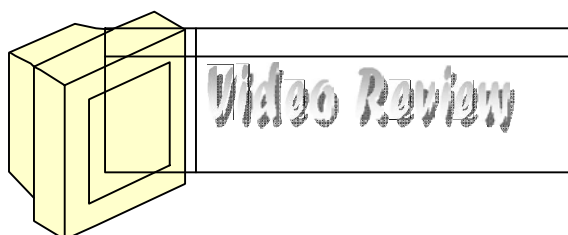


Reviews by

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I have to confess that I have an addiction to books about mathematics. As someone who stopped short of throwing herself into the heart of academic mathematics and headed down the seemingly far more real-world path of mathematics education, I think I have a constant fascination with what mathematicians do and with what mathematics is about. There are a surprising number of really well-written books about mathematics around. Some skilled writers are able to capture an essence of mathematics and tell its story in such a way that it can appeal to both a mathematical and entirely non-mathematical audience. A few of my books about mathematics became the most popularly borrowed books in the bookclub I belonged to – of which I was the only member with any mathematics beyond matric level! The book and video I am going to review here are my current favourites – and, in my view, of great potential interest to mathematics educators.



The Importance of Mathematics - A lecture by Timothy Gowers presented at the Clay Mathematics Institute, Millennium Meeting

The Clay Mathematics Institute (CMI) was founded in 1998 by a businessman from the USA, Landon Clay. It provides financial support for mathematicians and sponsors a variety of conferences, workshops and programmes in mathematics. At the CMI Millennium Meeting the Institute announced \$1 million prizes each for solutions to seven important unsolved problems in mathematics. For this reason the CMI Millennium Meeting attracted a lot of interest and the keynote address was Timothy Gowers' presentation on "The Importance of Mathematics". Timothy Gowers is the Rouse Ball Professor of Mathematics at Cambridge University. In 1998 he was awarded the Fields Medal for his work in functional analysis and combinatorics. The Fields Medal is one of the most prestigious awards for mathematics: it is awarded at the International Congress of the International Mathematical Union every 4 years, for exceptional contributions to knowledge in mathematics. One of its criteria is that the recipient must not be over 40 years of age. In his speech, which is shown in its entirety on the video, Timothy Gowers gives a wonderful oversight into what mathematics is and what mathematics is for. Over the course of an hour he provides a beautiful, clear, nuanced argument about why mathematics is important that goes well beyond simply providing immediate applications of mathematics to the real world. In fact he starts by saying

"Unfortunately, if one surveys in a superficial way the vast activity of mathematicians around the world, it is easy to come away with the impression that mathematics is not actually all that important. The percentage of the world's population, or even of the world's university-educated population, who could accurately state a single mathematical theorem proved in the last fifty years, is small, and smaller still if Fermat's last theorem is excluded".

He continues his argument further by saying that many mathematicians would not be able to point to a specific application of his or her *own* work. He claims this is because mathematics is a two-stage

process. Mathematicians do not study the world directly, but create models of the world and study those instead. He says:

“we study a model, a sort of idealized world that contains things that we do not come across in everyday life, such as infinitely thin lines that stretch away to infinity, or absolutely perfect circles, and does not contain untidy, worldly things like hamburgers, chairs or human beings.”

He then proceeds to build this argument, illustrating it with examples from areas of mathematical research like theoretical computer science, number theory and knot theory. He discusses mathematics as a richly interconnected web and shows how seemingly unrelated and apparently useless bits of mathematics in fact end up being connected to other branches of mathematics that in turn end up having important applications. He speaks of the beauty of mathematics and gives a wonderful explanation of how and why there is a correlation between mathematics that is beautiful and mathematics that is important. Gowers’ speech is eloquently presented and one has the feeling of having gained an important insight into what mathematics is and into some of what is currently going on and being developed within mathematics.

The video is available through Springer VideoMATH and a paper, based on the speech, is available on Timothy Gowers’ website at <http://www.dpmms.cam.ac.uk/~wtg10/importance.pdf>. In addition there are a number of aspects of his website (<http://www.dpmms.cam.ac.uk/~wtg10/>) that are of interest to mathematics educators so it is well worth a browse.