

Mathematics: embrace it because you cannot escape it

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Outline

- Increasing quantification
- “The maths problem in the UK”
- The role of mathematics support
- The sigma network
- Freely available resources
- Reflect on your students’ needs

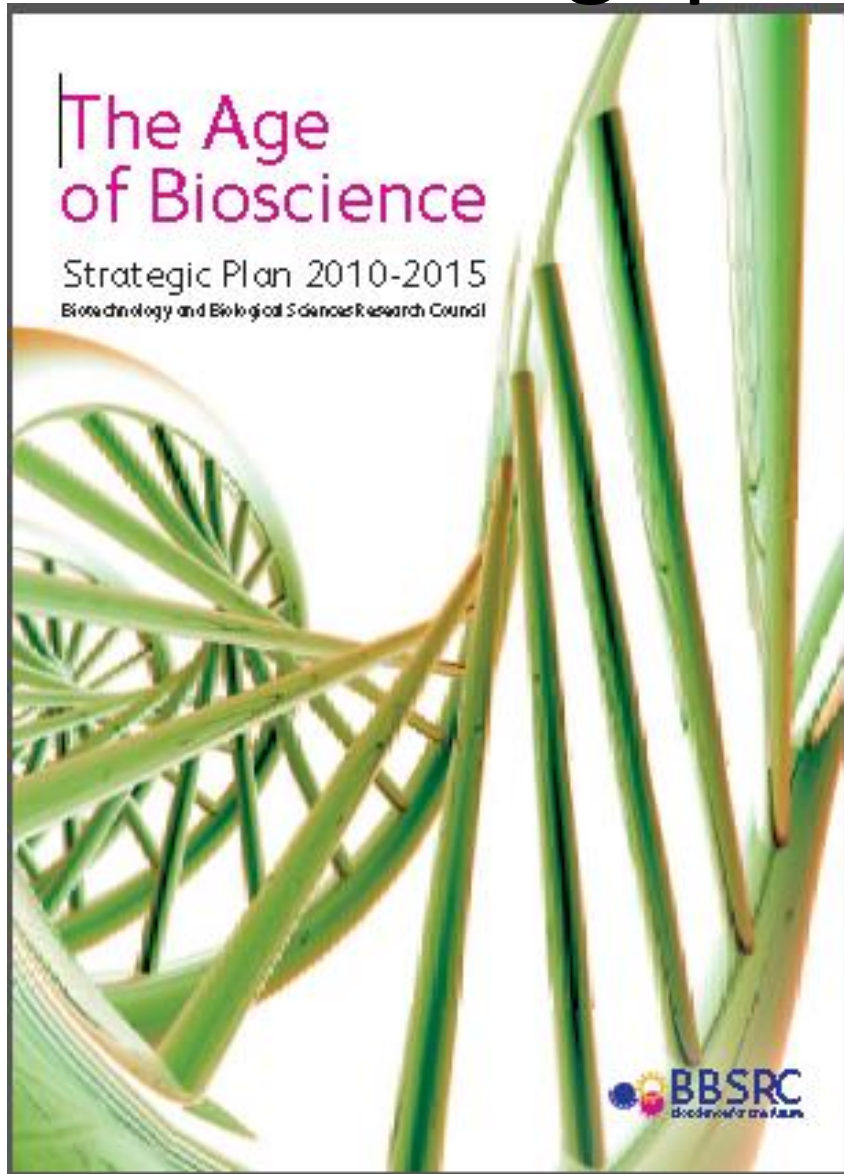
Increasing quantification (STEM)

- It has always been the case that students in STEM disciplines needed a good foundation in mathematics. Over the last 20 years or so this has become particularly problematic:

In 2006, the Royal Society argued that the gap between the mathematical skills of students when they entered HE and the mathematical skills needed for STEM first degrees was a problem which had become acute. ... The evidence we received suggested that the problem remains.

House of Lords Select Committee on Science and Technology report *Higher Education in Science, Technology, Engineering and Mathematics (STEM) subjects* (2012).

Increasing quantification (BioSci)



As bioscience becomes increasingly quantitative, there is also an urgent need to raise the mathematical and computational skills of biologists at all levels.

Biotechnology & Biological Sciences
Research Council
The Age of Bioscience: Strategic Plan
2010-2015

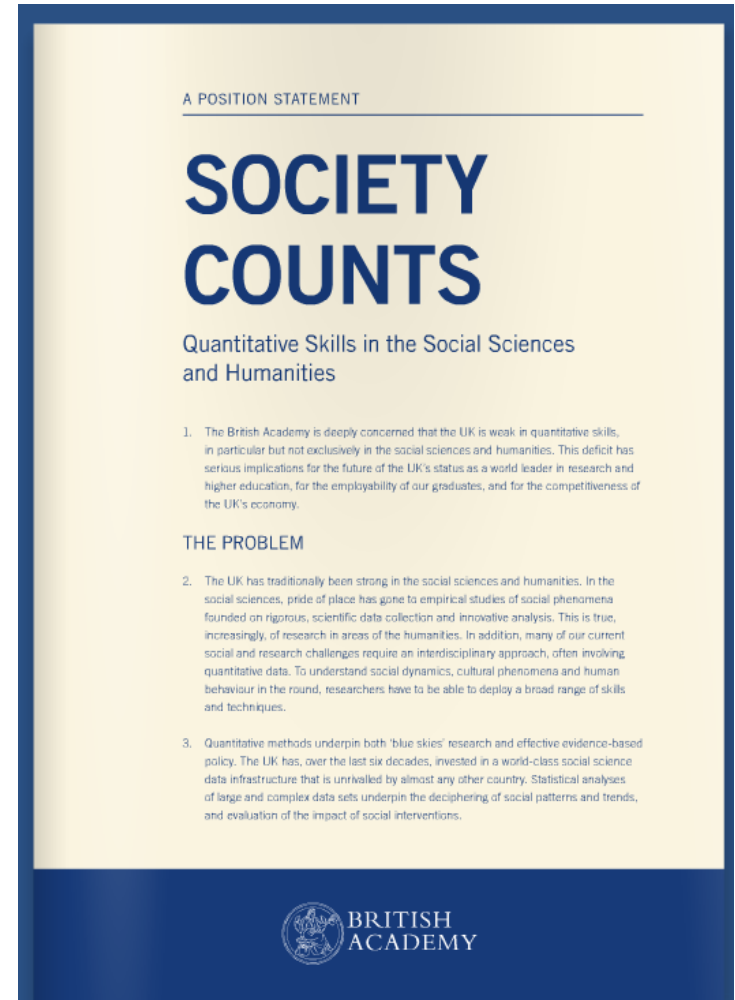
http://www.bbsrc.ac.uk/web/FILES/Publications/strategic_plan_2010-2015.pdf

Increasing quantification (SocSci)

- *The UK is weak in quantitative skills, in particular but not exclusively in the social sciences and humanities.... another reason for the poor skills of undergraduates is the dearth of academic staff able to teach quantitative methods*

British Academy position statement
Society Counts: Quantitative Skills in the
Social Sciences and Humanities (2012)

http://www.britac.ac.uk/policy/Society_Counts.cfm



Increasing quantification (RSA)



English universities are sidelining quantitative and mathematical content because students and staff lack the requisite confidence and ability. This has the potential to damage standards in English universities.

Solving the maths problem:
international perspectives on
mathematics education

Royal Society of the Arts (2012)

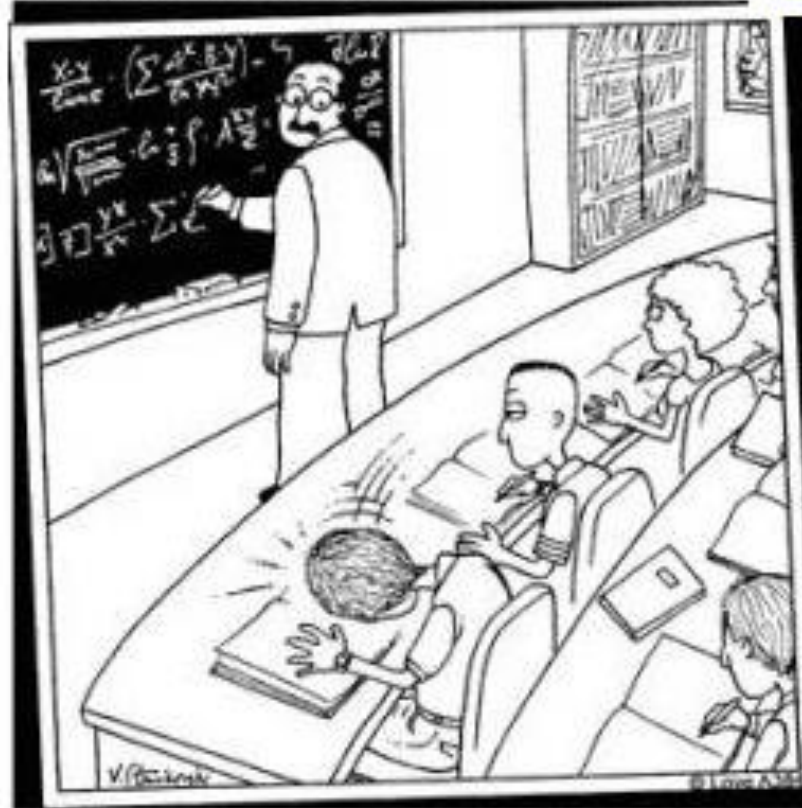
Increasing quantification (Employers)

An increasing number of graduate employers are using numerical reasoning tests as a standard part of their recruitment procedures.



The “maths problem” in the UK

Snapshots at jasonlove.com



Professor Herman stopped when he heard that unmistakable thud – another brain had imploded.

The “maths problem” in the UK

- *We estimate that of those entering higher education in any year, some **330,000** would benefit from recent experience of studying some mathematics (including statistics) at a level beyond GCSE.*
- *At the moment fewer than **125,000** have done so.*

ACME – Advisory Committee on Mathematics Education – June 2011

Mathematics Support

- Many higher education institutions now provide some form of mathematics support to help students across all disciplines develop their mathematics or statistics skills

So what is mathematics support ?

- activities and resources provided to support and enhance students' learning of mathematics and statistics, **in any discipline**, at any level of higher education and which are **provided in addition** to traditional lectures, tutorials, examples classes, personal tutorial sessions....
- Non-judgmental, informal, not credit-bearing
- Pleasant and non-threatening
- Supportive



The role of mathematics support



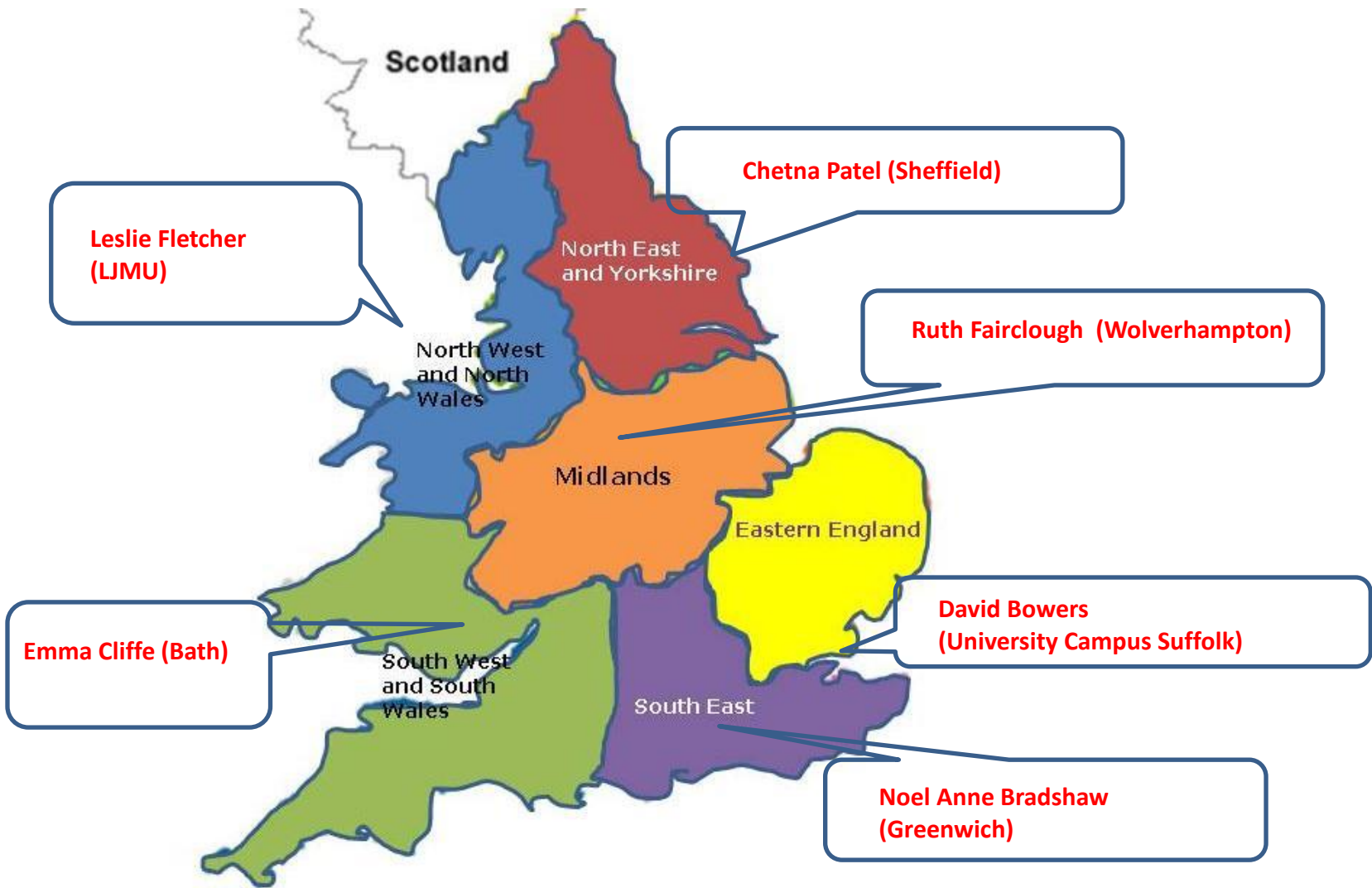
The one-to-one approach was essential as was the non-judgmental attitude of the lecturer who took pains to explain what would no doubt have been ordinarily an elementary point with patience and understanding.

History of maths support

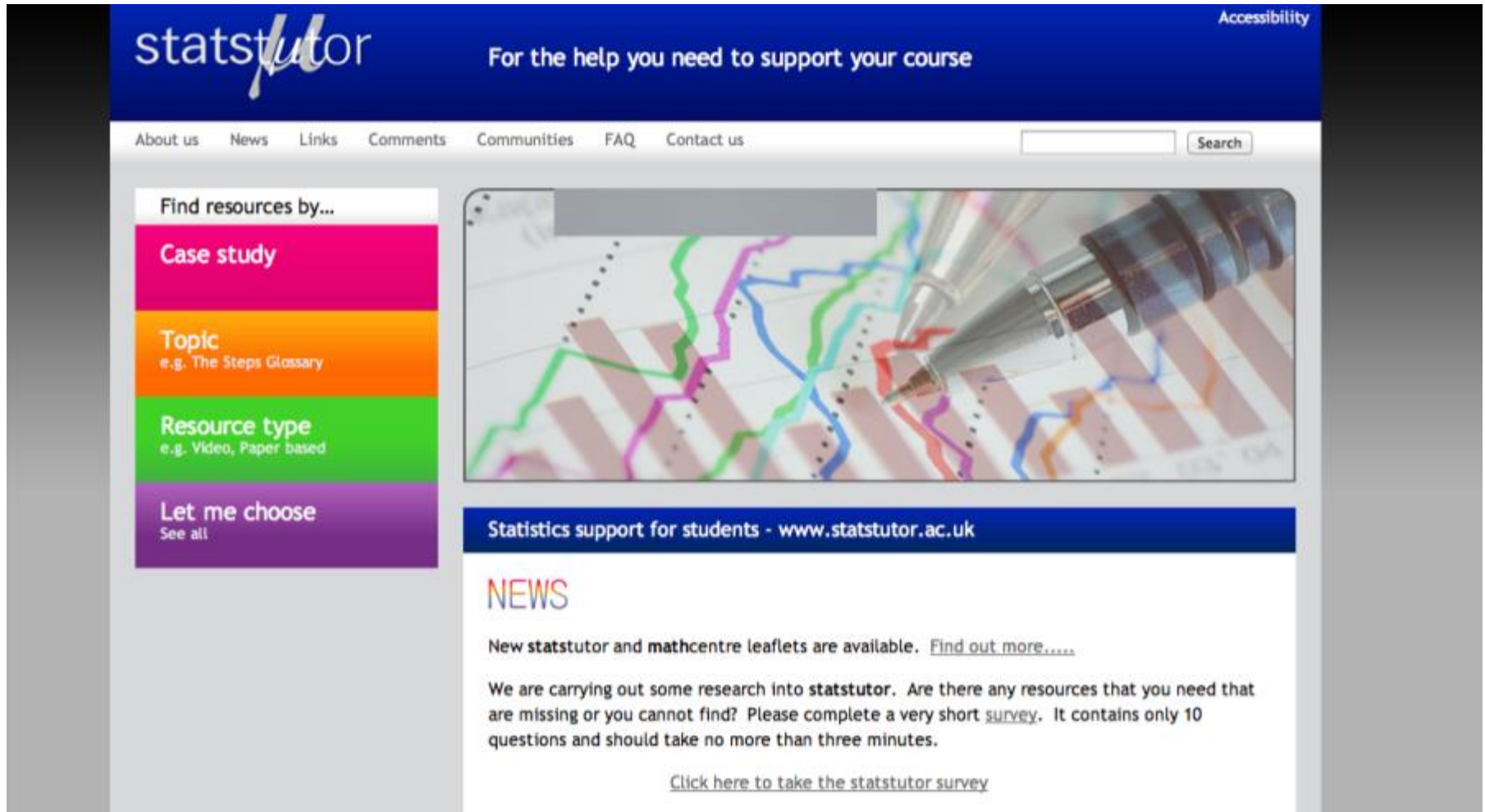
- 1990s emergence of maths support in some universities – particularly aimed at engineers
- 2005 **sigma** awarded CETL status by HEFCE
- 2009-2012 **sigma** working in the National HE STEM Programme facilitates 22 new maths support centres
- 2013-2016 HEFCE funding to **sigma** to establish maths support community

sigma: network of practitioners

- There is an established community of mathematics support practitioners
- www.sigma-network.ac.uk
- JISCmail list sigma-network
- Quarterly newsletter
- One of the most open, friendly and welcoming academic communities you will experience
- free maths and stats support resources



Tapping into resources: statstutor



The screenshot shows the homepage of the statstutor website. The header is dark blue with the 'statstutor' logo on the left and the tagline 'For the help you need to support your course' in the center. An 'Accessibility' link is on the right. Below the header is a navigation menu with links for 'About us', 'News', 'Links', 'Comments', 'Communities', 'FAQ', and 'Contact us'. A search bar is located to the right of the navigation menu. On the left side, there is a 'Find resources by...' section with four colored buttons: 'Case study' (pink), 'Topic' (orange, with the example 'e.g. The Steps Glossary'), 'Resource type' (green, with the example 'e.g. Video, Paper based'), and 'Let me choose' (purple, with 'See all' below it). The main content area features a large image of a pen pointing at a bar chart with overlaid lines. Below this image is a blue banner with the text 'Statistics support for students - www.statstutor.ac.uk'. Underneath the banner is a 'NEWS' section with a heading in large, colorful letters. The news text reads: 'New statstutor and mathcentre leaflets are available. [Find out more.....](#) We are carrying out some research into statstutor. Are there any resources that you need that are missing or you cannot find? Please complete a very short [survey](#). It contains only 10 questions and should take no more than three minutes. [Click here to take the statstutor survey](#)

Tapping into resources: mathcentre

The screenshot shows the mathcentre website with a blue header containing the logo and the tagline "For the help you need to support your course". A navigation menu includes "About us", "News", "Links", "Comments", "Communities", "FAQ", and "Contact us". A search bar is located on the right. On the left, a sidebar titled "Find resources by..." offers filters for "Course" (e.g., Economics, Bioscience), "Topic" (e.g., Mechanics, Algebra), "Resource type" (e.g., Video, PDF), and "Let me choose" (Narrow the search). The main content area features a photo of students looking at a tablet, a blue banner for "Mathematics resources" with URLs, and a "NEWS" section with text about DEWIS Test Yourself questions and Welsh language leaflets.

Reflect on your own students' needs

- Do you come across students who need to develop better maths skills ?
- Do some of your students choose quantitative project work ?
- What about when they start looking for jobs ?
What sort of jobs do they do ?
- Is maths support on offer to them?

Keep in touch

- Join the JISCmail list
- Subscribe to **sigma** newsletter
- Attend CETL-MSOR conference 8/9 September 2014, Cardiff
<http://www.sigma-network.ac.uk/cetl-msor/cetl-msor-conference-2014/>
- Take advantage of **mathcentre** community project for resource sharing



“Brilliant mathematician. Teaching second grade. Dies suddenly from no apparent cause. Something just doesn’t add up.”