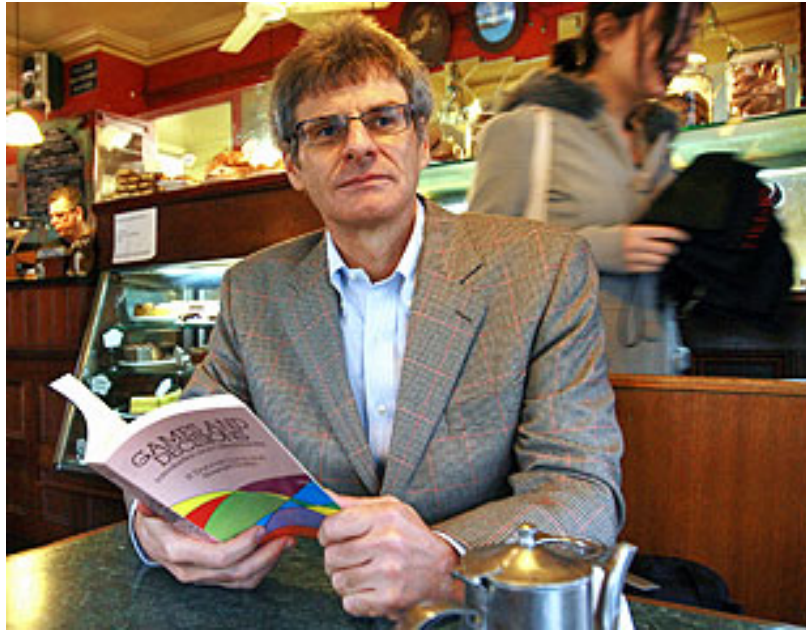# Proven ... it pays off to be faithful

Jill Rowbotham | *June 11, 2008*

Mark Colyvan (photo by Venessa Hunter)

GET a philosopher and keen game theorist started on the subject of love and you are in for a wild ride, which starts with some musing on "co-operative behaviour" (fidelity) and ends with the depressing news that the mathematical chances of meeting the right person are (drum roll) ... 37 per cent.

Right. Undaunted, the University of Sydney's Mark Colyvan is getting ready to plunge into these murky waters at the July meeting of the Philosophy Cafe in Melbourne.

It is something of a departure from his usual terrain.

As well as his role in the university's school of philosophical and historical inquiry, he is Sydney Centre for the Foundations of Science director, Australian Centre of Excellence for Risk Analysis chief investigator and project leader for the Research Hub for Applied Environmental Decision Analysis.

"Game theory is a mathematical means to understand interactions and co-operative behaviour," Professor Colyvan said.

"One application is the social contract, for example, the monogamous relationship: why, when faced with 'defection options' (infidelity), do people stay in faithful marriages?"

The trick is that the game is not a one-off.

"The value of being trusted outweighs the benefit you might get in the short term," he said.

"In a nutshell, it's naked self-interest. In a way it's utterly unsurprising, but it does surprise a

lot of people that you can do such a lot with self-interest: it sounds a bit like the only reason you are faithful is because you can get more out of it in the long term."

Professor Colyvan was intrigued by ways in which mathematical methods could shed light on relationships.

"And this is despite the fact that many people would contend that matters concerning human relationships are not open to such cold, hard formal treatments," he said.

"It is surprising how far one can get without appealing to romantic 'chemistry' or ethics. Perhaps it's not all in the mathematics, but a great deal of it is, or at least it seems to me."

Moving from the pros and cons of staying faithful to a partnership, he uses some "mathematical folklore", whose origins are lost in time, or at least in the mid-20th century, to broach the delicate matter of finding a partner: first applied to hiring what we now call a personal assistant.

The "secretary model" says that in a fixed pool of 100 applicants, you should interview (date) 100 people divided by the number 2.718, which is a universal constant. This is about 37 people. You then continue dating until you find someone better than any of those first 37.

"That strategy gives you the maximal probability of about 0.37 (that is, 37 per cent chance) of finding the best person in the pool of 100," Professor Colyvan said. Taking that on trust, he said, what was interesting was to see what happened when applicants played the game for different purposes, with "one group trying to optimise encounters of one kind or another, against others trying to optimise relationships that might lead to offspring".

Now there's an imponderable.