

MARY S. MORGAN

... on the curious uses of models, facts and narratives

Did the career path that you have been on seem like a conceivable possibility when you were growing up?

I don't think I had any notion of a path. I didn't have any particular ambitions, or think of myself as any particular kind of academic. My mother was a librarian. My father worked for Kodak all his life in a research lab. But they both loved music, so it was a very mixed humanities/sciences home life.

After school, I volunteered for a year – this was before gap years were really fashionable. I worked at a Quaker-run school for maladjusted children of high intelligence. Then I went to Manchester University to read American studies, because – like my A-levels in maths, history and English – it offered a bit of everything. But I had a lack of clarity about what I wanted to do, and I dropped out after a term.

After being a temp typist for a long time, I ended up at Citibank as an assistant to the economist – without having any economics myself. I joined the bank at a dramatic moment, when the post-Second World War 'Bretton Woods' financial arrangements finally collapsed. After a couple of years at Citibank, I realised I was not going to get on without a degree in economics, so I began again as a student, at the London School of Economics (LSE). After starting with economics, I switched to a joint degree in economics and economic history, in the first year this joint degree had ever been offered: we had seminars where there were two of us students and five faculty members, which was quite daunting.

Then I went to work at the Bank of England, which is an 'interesting' institution. I was dealing with inward direct investment. After about

six months, they hoicked me into a specialist unit looking at fraud and what would happen if you got rid of the Exchange Control Act. But when Margaret Thatcher became Prime Minister, the whole department was just shut down.

Because I thought there would be no career prospects there, I went back to one of my undergraduate supervisors, David Hendry, Professor of Econometrics, and said, 'I need a job. Any ideas?' He said, 'I need someone who is both an econometrician and a historian to write a history of econometrics before all the first-generation academics die. You can do it.' So, I became an academic almost by accident, or at least because of Mrs T.

You later returned to the LSE, but you have also held a position at the University of Amsterdam.

How did that come about?

The academic space I am interested in is the history and philosophy of economics. It is a very small field and there are almost no jobs specifically in it. Amsterdam had a half-chair in history and philosophy of economics, called the Klant Chair. I was asked if I would be interested, I applied, and was lucky enough to be appointed. This enabled me to create my own research group, and in turn to set up a research group jointly with the philosophy department at LSE. In that little research hub between the two places, we looked at models in economics and in physics, and then measurement in economics and in physics.

You were developing a new approach to scientific models?

The joint work with Margaret Morrison from that research group, *Models as Mediators*,¹ is now seen as creating a new strand.

The extant philosophy of science thought about models in relation to theory: models were ways of capturing the essence of a theory. What we were



Mary S. Morgan is Albert O. Hirschman Professor of History and Philosophy of Economics at the London School of Economics. In 2002, she was elected a Fellow of the British Academy, and Overseas Fellow of the Royal Dutch Academy of Arts and Sciences. She is the British Academy's Vice-President (Publications).

1. Mary S. Morgan and Margaret Morrison (eds), *Models as Mediators: Perspectives on Natural and Social Science* (Ideas in Context 52; 1999).

doing in that little research group – and what we did in the volume *Models as Mediators* – was to say, if you look at the way science is practised, you see that scientists treat models as autonomous objects on which they develop arguments. They manipulate them, argue with them, extend them. Models are not in a simple relationship between theory and the world, rather they are at angles to both, so you can use them to interrogate both sides.

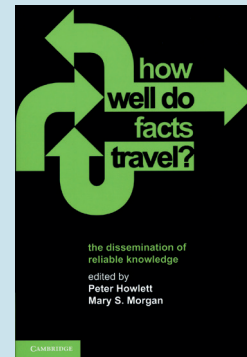
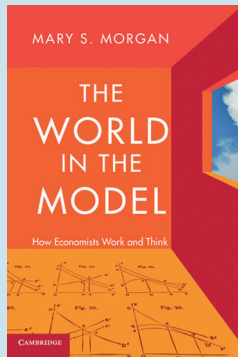
Models as Mediators is 20 years old, and you can definitely see now that the project as a whole changed the conversation in the philosophy of science about models. I don't mean that everybody was convinced by it, but it created a big enough presence so that, even if you didn't agree with it, you had to take it into account.

This work was part of a wider move that has been happening toward 'the philosophy of science in practice'. Older-style philosophy of science had the view that the role of philosophers was to figure out how science should work, and therefore create normative rules about how science should prove and confirm things, and what its theories should be like. In the last 15 years, there has been a move towards saying that scientists know things about the world, and the problem for philosophers of science is to figure out how – given that scientists don't quite do what we philosophers thought they should be doing. I am in this camp in saying that scientists are smart, they know things. The question is: how do they get to know things and to understand the stuff they are working with?

What is important about this new appreciation of science?

A better appreciation is quite important. It is useful to figure out why our models in economics do or do not work, how they can work, what they can and cannot teach you.

The econometricians are appreciative, because they believe in the history of their field: they think that the work of long-dead statisticians is still worth reading. They think much more seriously about methodology, and how you should do things at quite an abstract level. Should you start with the general model and break it down to a simple one, or should you start with a simple one and then grow it to be more complicated to fit the world? That is a pretty big difference in how you should do it, but it also has big implications for the kinds of models you end up with, and the extent to which you can understand a particular set of phenomena. This Amsterdam-LSE work on models led me into a much bigger project on modelling in eco-



nomics, which I was lucky enough to have funded by a British Academy Research Readership. This produced a rather too large book, which – to some readers' surprise – contains pictures and cartoons alongside the diagrams and equations.²

Of course, the functions of models in economics may not be the same functions as found for models elsewhere, not least because what counts as a model is different for different fields. There are lab rats, there are architectural models, there are pieces of mathematics. As models, they tend to have different qualities, which affect their functionality in their fields of use.

You had a big Leverhulme Trust/ESRC project on 'How well do "facts" travel?' What was that about?

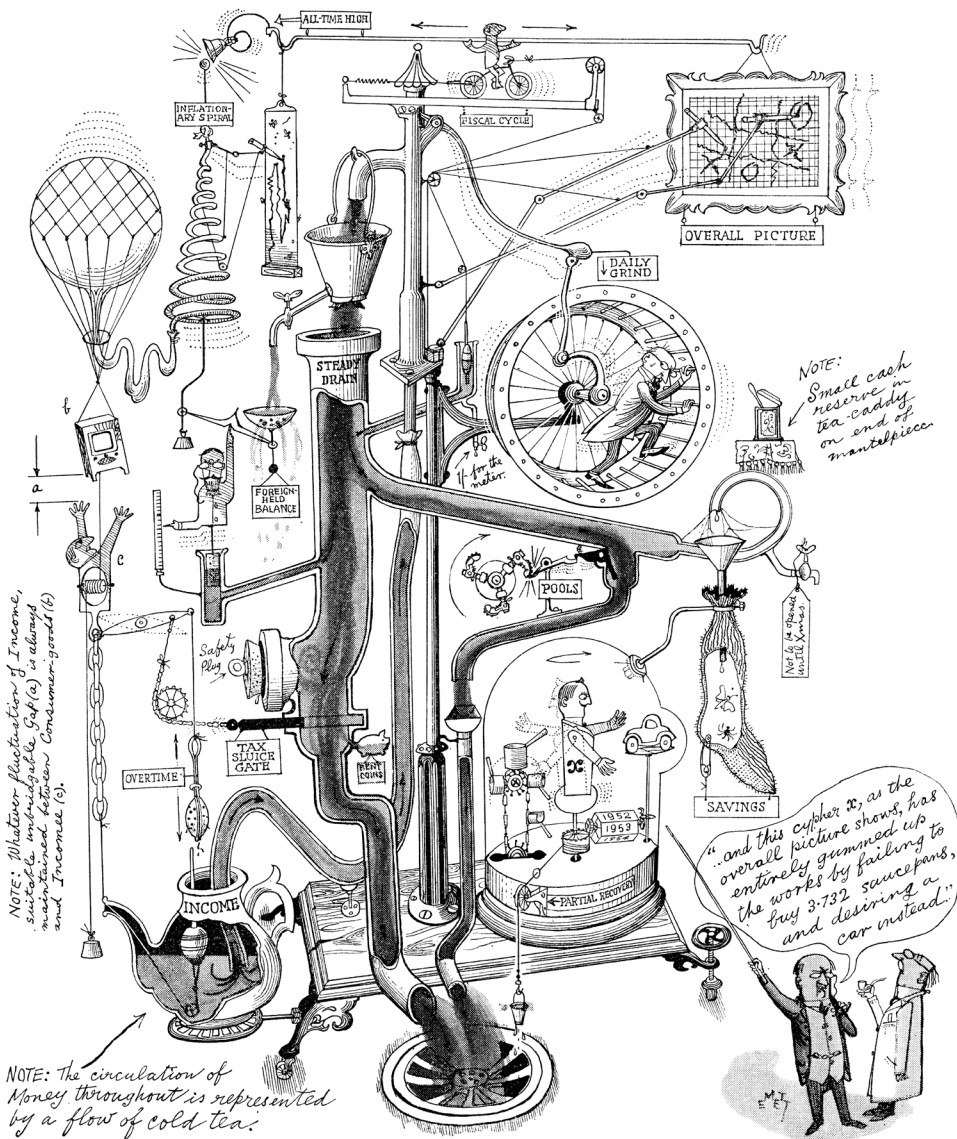
It was a great team project. I really enjoyed it, because it gave me scope to involve people across a range of subjects – not just in the history, philosophy and sociology of science, but from the humanities: architectural history, archaeology, literature, film, etc.³

'Facts' are understudied, they are taken for granted. It has been pointed out that, if you look at science newspapers, the only time scientists use the word 'fact' is when they add an adjective to it – 'big facts', 'important facts'. That triggered a discussion about distinguishing between lots of little facts and data points, and things that are big and useful enough in their own right.

We used the term 'reliable', rather than 'true': the important part of this character of being fact-like is that a piece of knowledge is reliable enough for you do things with, and that means it needs to maintain a certain amount of stability of content and meaning. This proved a more useful framing than asking whether it is true or false. Only a specialist scientist can say whether a fact about HIV is true or false? *I can't say it is true.* But I can recognise if communities found it reliable. That seems a much more stable thing to be able to do. If a fact is true only in one instance and only

2. Mary S. Morgan, *The World in the Model: How Economists Work and Think* (2012).

3. Peter Howlett and Mary S. Morgan (eds), *How Well Do Facts Travel? The Dissemination of Reliable Knowledge* (2011).



MACHINE DESIGNED TO SHOW THE WORKING OF THE ECONOMIC SYSTEM

This 1953 Punch cartoon by Rowland Emmet is a humorous depiction of the hydraulic machine designed by Bill Phillips and Walter Newlyn to model the macroeconomic system. © PUNCH LIMITED.

in 1963, it is not much of a fact. You want knowledge that is reliable enough to act on.

We spent a lot of time trying to figure out what we meant by facts 'travelling well'. The fruitful meaning is obvious: other people use them to do something useful with. We thought a lot more about integrity and the importance that a fact remains a fact remains a fact, even if it gets

shaded or rounded off. The facts with most integrity are ones you then completely take for granted, no one knows where they came from.

As another example of how concepts gain momentum, you wrote a paper looking at the concept of the 'glass ceiling' and how that got currency.

The question here is: how does the experiential knowledge of people in society – community knowledge – feed into social sciences? There is an intersection between academic social science, human experience, and a bundle of groups in between who have expert knowledge that is not academic but is experiential.

In that paper I tried to give an account of how those different forms of knowledge interact, and how concepts like the glass ceiling are formed in social science and come to be taken as real phenomena in the world, as opposed to figments of someone's imagination. It is understanding and making use of this alignment between the knowledge of the experienced expert and the academic knowledge in social science that make

the study of social scientific concepts so challenging and so interesting.

Your current big project is on narratives and science. Again you say that philosophers of science have tended to ignore the way that scientists use narrative, but the narrative is actually really important.

Our claim is that narratives are important but overlooked.⁴ We think it is fairly widespread for scientists to use narratives within their own community – not for teaching or for popularising – but for their own purposes. But that often disappears

4. Mary S. Morgan and M. Norton Wise (eds), *Narrative in Science* (Studies in History and Philosophy of Science Part A special issue, 62; 2017).

in the written papers. At an economics seminar, an economist might write a model up on the board and then say, 'The story here would be...' It is a very strange construction: 'The story here *would be*.' It is because there is a process: 'If we asked this of the model, what then would the story be?' That all disappears in the printed material of economics, but it is part of the community usage of models and simulations.

Your 2013 Keynes Lecture in Economics addressed that 'what if?' question.⁵

It is exactly that – the 'what if?' question.

But the issue for my current project is whether narratives are more generic. Obviously they come into natural history. Why did the dinosaurs die out? It is a popular question, but one seriously argued about by people in that field. There are various different accounts and, like lots of explanations, they all have narrative structure.

Philosophers of science have thought that narrative is only relevant for history. They think that narrative cannot explain anything in science, because science needs an explanation that is not just a one-off – it has to derive from laws or knowledge of causal relations and be applicable to a set of phenomena within the same range. Historians want to explain particular events and rather think: 'What else would you use? How could you explain anything without a narrative?'

With this new project group of post-docs (funded by the European Research Council), I am trying to get at the core questions. How does narrative work? What forms does narrative take? Is there something different about scientific narratives? Can you use literature terms such as plot, genre, style, in science – can one think of there being a set of scientific plots? (I am a bit agnostic, perhaps on the verge of thinking this isn't terribly useful, but I am waiting to see.)

Beyond that, can we pin down the kinds and sites of science where narratives are being used? And, if they are being used, what function do they play? One postdoc researcher is looking at chemical synthesis. You synthesise something, tell a narrative about that synthesis, and then have a narrative about how else you might produce it: 'maybe, if we did this, this and this, we would also get it.' I have a postdoc who is looking at geological narrative. This could be straightforward – if ever there is a field that is naturally historical it is geology. But do geologists have two or three main narratives and everything is a variation of those, or are all the narratives purpose-built? Biology has some quite good general-level laws; but if you want to explain

anything and get down to particulars, you end up with narrative accounts. And I have a colleague who says we should think of mathematical proofs as narratives. Mathematical proof-making is like a stepwise sequence in which you join up the steps. Each one might be a little narrative, building into a larger narrative. In fact, this is what I found happens in social science case studies: lots of small narrative chunks being fitted together to make a large narrative of society. This narrative science project grew out of my work on case studies, funded with a wonderful grant from a British Academy Wolfson Research Professorship.

There is a great benefit in all of these projects – on models, facts, and narratives – in having a core group of people who are working on different aspects, so that you can develop resources in several different ways.

I think this work on narrative, like the models work, will be a conversation changer. When we first started, people were dismissive of the idea of narrative science, because it was thought to be about popularisation. Now I hear a PhD student saying, 'I cannot think of a scientific concept that is not based on narrative.'

Is the point about narratives just that, because we are human, we need stories to help us understand?

Maybe, but there is some evidence from psychologists that not everyone 'gets' narrative. And there is a lot of knowledge about phenomena in which we make no appeal to narrative – the obvious example being categories and classifications. Scientists can spend a lot of time dividing things in the world into classes, labelling and characterising them. But that is not a narrative way of doing things, because it is dividing and labelling, not bringing elements together and joining them – as narrative does. If we were naturally narrative and only understood things through narrative, we would not 'get' all this classificatory stuff.

A conference held in September 2017 to talk about your work had the title 'Curiosity, Imagination and Surprise'.

They are three good things, aren't they?

For me the important thing is getting interesting questions, ones that haven't been asked before, so that you can open up new spaces. If someone else has already started on a problem, you want to phrase the question in a new way, so that you can think about it in a different way and maybe come at it sideways, from a different angle. That is my advice to all my postdocs: keep asking questions – and don't let your agenda be set by anyone else.

5. Mary S. Morgan, 'What if? Models, fact and fiction in economics', *Journal of the British Academy*, 2 (2014), 231–268. This article discusses the hydraulic machine model depicted in cartoon form on the facing page.



Some volumes in the Proceedings of the British Academy series published in 2017–18.

Then you need curiosity and imagination. The curiosity spurs the imagination to develop possibilities. And you hope you get surprised on the way. You don't want to find exactly what you expect, otherwise you have not learned anything. If you get surprised, you ask more questions, so for me it is a very valuable ambition to be surprised.

You were elected a Fellow of the British Academy in 2002. And you have been the Academy's Vice-President for Publications since 2014. Why should the Academy have its own academic publications programme?

The humanities and social sciences have long needed and relied on books that they create, disseminate and argue with. A book enables you to lay out a lot of stuff in a way that relates it all together, giving you depth and breadth. You can't do that in simple forms. You need a complicated and weighty form, and a book is that. If the senior academic society representing our disciplines is not able to produce these kinds of objects out of our own community, we are in a bad shape. And while material should be there digitally on the web, it still needs to be available in physical form too.

One of the ways that we, as a publisher, really add is through the themed volumes of essays in our *Proceedings of the British Academy* series. Our *Proceedings* volumes provide a form of that complexity, depth and breadth, in a way that is not just from a single author. I like to think of them as effectively monographs by many authors. And because we focus on getting the right content in one place, with a good introduction, someone can come to one of those themed *Proceedings* volumes and really get into a topic, subject or space – which they cannot always do with journals, even with their special issues.

And by having both the programme of British Academy Conferences and the academic publications handled by the one committee, we are able to make suggestions at the formation of a conference

which will be really valuable for any subsequent *Proceedings* volume arising from it. You could say we are trying to make the volume a melded, baked cake, not just a set of ingredients. The most wonderful and fun thing about the Publications and Conferences Committee is that everyone takes part in that editorial moulding, and everyone has an interest in making sure the volume introductions are the best possible framing for the collections of essays.

As you come to the end of your term as Vice-President, there is now a big new discussion of whether the rules requiring academic journal articles to be made available 'open access' should be extended to cover academic monographs too. In May 2018, the British Academy issued a position paper on this.⁶ What are the concerns here?

I am amazed at how much more complicated it is for monographs than it is for journals. The sheer variation among publishing houses makes it so much more complex. So too the range of things that academics want to write. Senior academics and junior scholars need lots of different possible places to publish, not least because they come from lots of different fields that require different things from published monographs. One of the big dangers is to imagine that there is one solution, which may have the effect of severely reducing that range of possibilities. Saying that there will be lots of different business models under any new arrangements is not enough. The economic forces may tend to bring down the possibilities of publishing monographs to a smaller number, and create a much more limited set of ways of doing things.

The ecosystem of writing and publishing monographs is very complex, and attempts to fit it into a box are likely to leave out a whole lot you would want to keep if you want to maintain a vibrant level of writing and publishing long-form books. The language of stakeholders is not very helpful here, as it is not one system and there are so many different kinds of agents and actors involved. Instead we need to think of the creation and distribution of long-form books as dependent on an ecosystem of academic authors, publishers, universities, libraries, and the public stake, not just locally but internationally. Any change in one part of this ecosystem is likely to affect the whole terrain.

The British Academy has always supported the principle of extending the access of both specialists and the general public to the fruits of academic research. Finding good ways to extend that access consistent with the continuing health and growth of the ecosystem is a considerable challenge. ■

6. 'Open access and monographs: Where are we now?' A position paper by the British Academy (17 May 2018).