



Joseph Meister, the first person to receive a rabies vaccine, at the Pasteur Institute in Paris.

# Great myths die hard

Finding that part of the story of Louis Pasteur's rabies vaccine is false, **Héloïse Dufour** and **Sean Carroll** explore how science fables are born, spread and die.

John Snow's ending of London's 1854 cholera outbreak, Joseph Lister's development of antiseptic surgery, Alexander Fleming's invention of the drug penicillin — the history of science and medicine is full of such stories of great deeds by heroic figures.

But these are myths. They are grounded in some reality, yet careful historical research

has revealed them to be far from accurate<sup>1,2</sup>. And, despite having been exposed by historians, the fables live on — in books, on television, in classrooms and online.

We have discovered that another story from the history of science — the heroic death of Joseph Meister, the first person to be saved by Louis Pasteur's rabies vaccine — is

also a myth. Here we dissect Meister's story to understand how such myths are born, why they die so reluctantly, and what could be done to puncture them.

## HOW MEISTER DIED

In July 1885, a 9-year-old French boy named Joseph Meister was badly bitten by a rabid dog, and faced near-certain death. Instead, young Meister entered medical history: he was Louis Pasteur's first human patient to be treated and saved by a rabies vaccine.

For more than half a century<sup>3</sup>, accounts of the story in both English<sup>4-6</sup> and French<sup>7</sup> have been given a dramatic ending. In 1940, 55 years after his life was saved, Meister was serving as a gatekeeper at the Pasteur Institute in Paris. The story goes that when German forces invaded Paris in June that year, soldiers arrived at the institute demanding access to Pasteur's tomb and, rather than surrender his saviour's resting place to the Nazis, the 64-year-old Meister killed himself.

Two years ago, while researching life in occupied Paris for a book on biologist Jacques Monod<sup>8</sup>, we came across a contemporaneous diary by Eugene Wollman in the archives of the Pasteur Institute<sup>9</sup>. Wollman was head of the institute's bacteriophage lab and resident on site, and his entries directly contradict the popularized accounts of Meister's suicide. The diary reveals that the date, means and motive have each been altered in the making of a myth.

In the widely repeated narrative, Meister killed himself on 14 June<sup>4</sup> or 16 June<sup>5</sup>, just after the German invasion of France. But on 24 June, ten days after the Germans entered Paris, Wollman wrote: "This morning, Meister was found dead." It is often reported that Meister shot himself<sup>5,6</sup>, but Wollman stated: "He committed suicide with gas." Some sources note that Meister committed suicide because he could not bear the idea of the Nazis profaning Pasteur's tomb<sup>3-7</sup>. Wollman makes no mention of any such incident. Instead, he indicates that Meister was "very depressed" and that "his wife and children had left"<sup>9</sup>. Like millions of others, they had fled Paris ahead of the onrushing German army.

Our interest piqued, we scoured published accounts<sup>10,11</sup> of Meister's death, as well as several written sources in the Pasteur Institute's archives and museum<sup>12,13</sup>. Moreover, Marie-José Demouron, Meister's granddaughter, kindly granted us an interview. Together, these sources confirm Wollman's version and shed further light on the motive for Meister's suicide. Meister apparently believed that his family had perished in enemy bombing, and was overwhelmed with guilt for having sent them away (ref. 11, and M.-J. Demouron, personal communication). In the chaos of France's collapse,

it was almost impossible to get news from loved ones, so Meister was unaware that they were safe. His wife and daughters actually returned later on the very day that he killed himself. As Wollman noted<sup>9</sup>: “Life has an extraordinarily refined cruelty.”

The story of a man in despair over the apparent loss of his family, and taking his life using a gas stove hours before they come home, is tragic. But it is far from the myth of a humble servant thwarting invaders. Our sources show that the truth was not smothered from the start<sup>10,11</sup>. So how was the myth born?

### MYTH MAKING

A myth-making pattern seems to be emerging from the researches of many science historians over recent decades<sup>1,2</sup>. Stories such as Meister's are founded on some facts, which are then moulded to create or fit the ‘great man’ model.

Fleming, for example, did isolate the anti-bacterial product of a mould, and did name it penicillin. But he was not responsible for the development of the antibiotic drug used in humans 14 years later, nor was he even in contact with the scientists responsible for that<sup>1,2</sup>. The catalysts to the making of this myth are fairly easily identified. Successful clinical trials of penicillin were first reported in 1941, in the thick of the Second World War, when infected wounds caused enormous casualties. Wartime newspaper editors naturally looked for heroic stories to inspire and encourage readers. Accounts traced the miracle drug to Fleming's serendipitous discovery many years earlier — as *The Times* of 12 June 1944 put it: “Providence had been kind to us in letting us have this most powerful agent ... when against our will we were plunged into a bloody war.” Similarly, Meister's story was probably distorted in part because of the war. The heroic version of his suicide embellishes the Pasteur legend and doubles as a tale of resistance.

As the myth is repeated it can become more disconnected from reality, and takes on a life of its own. After the Meister narrative began to involve German soldiers and their access to the crypt<sup>3</sup>, the suicide date shifted closer to the Nazis' arrival in Paris. Meister was then said to have shot himself<sup>4</sup>, and with his First World War revolver<sup>5</sup>. In some accounts, he is even shot by the Nazis<sup>14</sup>.

The Fleming legend too has seen attempts at further glorification, with the claim that Fleming saved the life of former British Prime Minister Winston Churchill — twice. As a child, Fleming purportedly rescued a young Churchill from drowning, and later he was said to have cured Britain's leader with penicillin. Both claims were eventually discredited (see [go.nature.com/hfakhl](http://go.nature.com/hfakhl)). But if the truth is available, why are

fabricated stories still perpetuated?

Historians have long recognized that the main reason that certain myths get repeated is because they contain the ingredients of good storytelling<sup>1,2</sup>. Tenacious myths have heroes and villains, portray tragedy and triumph, and present climactic actions and revelations. For example, Snow did map the London cholera outbreak and correctly attributed it to a contaminated public water pump. Inconveniently, he did not remove the pump handle and end the outbreak. A committee took that action, and only after the outbreak had abated<sup>1</sup>.

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Myths also inflate admirable qualities in their protagonists. Lister is portrayed as an eccentric outsider defending the scientific truth against a hostile environment; in fact, his use of carbolic acid was hardly revolutionary for the time<sup>1</sup>. And many members of the Pasteur Institute did put up resistance against the Germans, but Meister's suicide made history because it was portrayed as a manifestation of Pasteur's eminence.

A myth is also perpetuated when authors rely on a self-referencing body of previous work, rather than on primary or secondary sources. The more often one sees the same version of a story, the more likely one is to accept it as truth. This phenomenon is now amplified by the Internet. So how do we get to the real story? And why is it important to do so?

### MYTH BUSTING

Scientific myths are harmful. They distort the history and the process of science<sup>1</sup> by portraying researchers as extraordinary people making epic advances in a fast, linear fashion. Such tales are particularly damaging to the public's and to students' understanding of the pace and complexity of science. For example, the Fleming myth ignores the vast time, effort and extra data that are required to make a medically viable drug. And by crediting luminaries with fictional achievements, we create superheroes that no student can hope to match.

Storytellers — journalists, authors, filmmakers, scientists and educators — need to be vigilant when it comes to their sources. Of course, primary and well-documented secondary sources are optimal. We recognize, however, that the search for facts surrounding events long past can be difficult and time-consuming, and it is tempting to accept something that has been widely repeated. Indeed, were it not for the discovery of Wollman's diary, one of us (S.B.C.) would have been close to propagating the Meister myth. Still, if at least we are aware

of the predisposition to embellish histories, that might discourage us from parroting them without solid evidence<sup>1,2</sup>.

Another step is to ensure that once myths have been debunked, the truth gets exposure. The Internet is both an asset and a liability in this endeavour. In the Meister case, the myth has snowballed to the point at which an admittedly fake ‘contemporary journal article’ is now highly visible online (see [go.nature.com/wqo2z6](http://go.nature.com/wqo2z6)) and is sometimes referenced as legitimate. But this power can be used to advantage. Wikipedia, for example, is a widely accessed, often initial source of information that promotes the use of mostly primary and secondary literature. Myth-busters should therefore make sure that the results of their work, and especially their sources, are properly referenced in this encyclopaedia. Other tools, such as Google Books, can be used to scour vast amounts of the published literature. Such a survey led one reader to expose the Fleming–Churchill myth.

Myths are born because they fulfil our need for a good yarn, but a powerful way to eliminate them is to replace the fiction with facts that are equally satisfying. In the case of Joseph Meister, his suicide out of despair for his family less than 24 hours before they returned is a moving story. However, because it no longer burnishes Pasteur's legend, it remains to be seen whether Meister's death will be as widely mentioned by the next wave of scientific biographers. ■

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