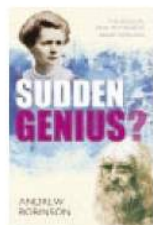


# Eureka! Genius unravelled

Extraordinary thinkers, not ordinary people, are key to understanding creativity, says **Arthur I. Miller**

*Sudden Genius? The gradual path to creative genius* by Andrew Robinson, Oxford University Press, \$34.95/£18.99



WE HAVE all heard of the great “Aha!” moments that typify legends of sudden genius. But such moments, argues Andrew Robinson,

are merely anecdotal. In reality, he says, the emergence of a creative solution to a difficult problem takes a great deal of conscious work. To make his case, Robinson offers vignettes of four scientists, a linguist, an architect, a musician, a writer, a film-maker and a photographer in this lively book.

So how does the moment of creativity occur? One explanation was proposed a century ago by the great French polymath Henri Poincaré, based on his own profound mathematical discovery in 1881. Some 30 years later, Poincaré published an analysis of his own thought process. It goes like this: After a great deal of conscious work he became stuck and put the problem aside. But his desire to solve it kept it alive in his unconscious. Illumination occurred beneath the surface, then bubbled into consciousness. From there he was able to check his result and find that it was correct. Poincaré’s four-stage model – conscious thought, unconscious thought (or incubation), illumination and verification – has since been studied in depth and refined.

Robinson discusses the four-stage model at length, then blithely dismisses it on the basis of psychologist Robert Weisberg’s



Creative breakthroughs seem to require unconscious thought

claim that psychological tests on “ordinary subjects” do not reproduce incubation and illumination in problem-solving. That’s no surprise: Weisberg doesn’t believe in the efficacy of unconscious thinking, arguing that it cannot explain everyday conscious problem-solving. Also, can we assume that Weisberg’s ordinary subjects had the same sort of passionate desire as Poincaré to solve the contrived problems offered to them?

Scientists such as Albert Einstein, Hermann von Helmholtz

and Werner Heisenberg described their creative processes in similar terms to Poincaré. Historians of science, along with cognitive scientists and psychologists, take these reports seriously because they offer insights into the minds of extraordinary individuals.

For Robinson, such reports are suspect, since they were made years after the discoveries. However, had he studied the literature on Poincaré’s self-analysis (some cited by Weisberg) he would have found that Poincaré had been interested in the sources of his creativity for years. I have uncovered that, in

1895, Poincaré was analysed face-to-face by psychologist Edouard Toulouse, who studied creativity in science, art and literature. Toulouse’s analysis of Poincaré’s thinking squares with Poincaré’s own. Interestingly, one of Poincaré’s colleagues in the 1880s was French neurologist Jean-Martin Charcot, from whom Sigmund Freud learned much about the unconscious.

The four-stage model is the best creativity model we have.

**“Illumination occurs beneath the mind’s surface, then bubbles into consciousness”**

It is supported by experiments showing that in the unconscious we can activate complexes of information inhibited in our conscious and use these to provide possible solutions to the problem at hand. These solutions are considered in parallel in the unconscious and the results find their way into conscious thought. Although we still don’t completely understand unconscious processing in creative thinking, I disagree with Robinson that it is still “fundamentally, an enigma”.

On the whole, this book does serve a useful purpose: it highlights the fact that creative people are complex individuals who focus on their work to the exclusion of all else. There is no royal road to creativity. ■

Arthur I. Miller is a historian of science and emeritus professor at University College London. He is author of *137: Jung, Pauli, and the pursuit of a scientific obsession* (W.W. Norton, 2010)