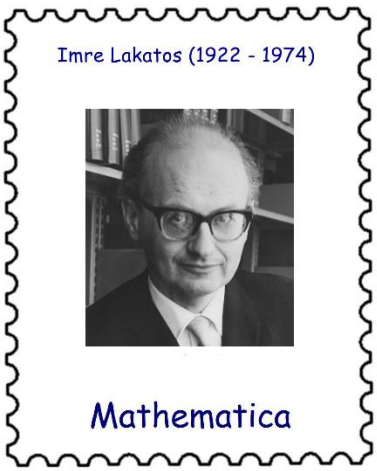
Imre Lakatos (November 9, 1922 – February 2, 1974)

by HEINZ KLAUS STRICK, Germany



When in 1963 the *British Journal for the Philosophy of Science* published a four-part essay by IMRE LAKATOS entitled "*Proofs and Refutations*", it caused a stir in both philosophy and mathematics. Until then, mathematics had been viewed by the general public as a repository of eternal truths and exact conclusions – now LAKATOS presented it as a dynamic, historical, and error-prone process.

His central thesis: Mathematics does not develop through axiomatics and formalism, but through dispute and doubt, through counterexamples and through creative adaptations.

LAKATOS's life itself was at least as eventful as his philosophy – a life between totalitarianism, exile and intellectual awakening.

He was born under the name IMRE LIPSCHITZ to Jewish parents in Debrecen, Hungary's second-largest city (located near the Romanian border), during a time of great political upheaval.
As a result of World War I, the Kingdom of Hungary had lost two-thirds of its former territory. Communists proclaimed a *Soviet Republic*, and after a few months, their government was overthrown by the (conservative) National Army. Thus, even after the end of the Habsburg Dual Monarchy, Hungary formally remained a kingdom, albeit without a king. The authoritarian *Imperial Regent* MIKLÓS HORTHY allowed numerous acts of revenge against socialists, communists, and Jews (the so-called *White Terror*). Since some Jews were involved in the government of the Soviet Republic, this was used as an opportunity to restrict the rights of Jewish citizens, for example, by excluding them from civil service or making it difficult for them to study at universities and practise certain professions through a quota or *numerus clausus.*

Nevertheless, IMRE LIPSCHITZ was able to study physics, mathematics and philosophy at the University of Debrecen and graduated in 1944.

As an ally of Germany, Hungary was increasingly exposed to pressure from the German government to participate in the “Final Solution to the Jewish Question” – high time for IMRE LIPSCHITZ to abandon his typically Jewish family name.

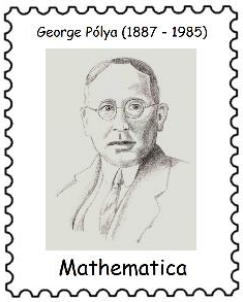
Instead of LIPSCHITZ, he chose the surname MOLNÁR and joined a communist underground group; his mother and grandmother were deported to Auschwitz and killed there.

After the war, IMRE MOLNÁR married his underground comrade, ÉVA RÉVÉSZ; the marriage broke up after a few months when his wife turned to another man. This personal disappointment may have contributed to his later distant attitude toward women.

He later gave a simple reason for changing his family name once again, to the name LAKATOS (literally: *locksmith*), which was widespread in Hungary: his shirts were marked with the initials IL ; and since he had no money to buy new clothes and did not want to go back to his old family name, he looked for a new name that matched the initials. He left open what led to his choice – whether it was the working-class profession of a locksmith or a tribute to Hungarian Prime Minister GÉZA LAKATOS, who had tried in vain to secure a separate peace for Hungary during his six-week reign in August/September 1944.

IMRE LAKATOS , still a committed communist, worked in the Ministry of Education, headed a teacher training institute, and wrote texts on the philosophy of science from a Marxist perspective. In 1950, he was sentenced to prison without trial for "deviant tendencies".

After his release in 1953, the year of JOSEPH STALIN 's death, the mathematician ALFRÉD RÉNYI ("*When I am unhappy, I do mathematics to become happy. When I am happy, I do mathematics to stay happy.*") helped him find a job.



Among the books LAKATOS translated into Hungarian during this period was GEORGE POLYA's *How to Solve It* .

In 1956, the attempt by Hungary's communist government to renounce its membership in the Warsaw Pact and establish a free parliamentary system in the country was brutally ended by the invasion of Soviet troops. A puppet government was installed, hundreds of people were executed, and tens of thousands were imprisoned. Facing imprisonment, LAKATOS, like more than 200,000 other Hungarian citizens, fled to Austria.

From there, he went to England to further his philosophical studies at the University of Cambridge and to obtain his doctorate. His doctoral thesis, entitled *Essays in the Logic of Mathematical Discovery,* was accepted in 1961. At the suggestion of GEORGE PÓLYA he chose the history of the EULER-DESCARTES formula $v-e+f=2$ as his topic.

Even before receiving his doctorate, LAKATOS had accepted a teaching position at the *London School of Economics* (LSE), which he held for the next 14 years until his untimely death. His in-depth lectures on the philosophy and history of mathematics and the natural sciences were always packed, the content challenging and fascinating, entertaining even for non-specialist listeners.

LAKATOS was repeatedly encouraged to publish his four-part work "*Proofs and Refutations*" in book form. However, he repeatedly postponed this, believing the text needed improvement. As a result, the book, subtitled "The *Logic of Mathematical Discovery",* was not published until two years after his death – in an annotated and expanded version by his former collaborators JOHN WORRALL and ELIE ZAHAR.

In the introduction to the work, LAKATOS states that mathematical knowledge develops through a process characterized by errors and corrections. He then demonstrates this using the example of a fictitious Socratic dialogue between a teacher and his students, such as might take place in a mathematics class. In the flow of the dialogue, LAKATOS considers the historical succession of approaches to proof that have repeatedly been refuted by counterexamples.

In a first attempt to prove the theorem, a polyhedron is decomposed into simpler parts. The example of a polyhedron with a hole (topologically, this corresponds to a torus) then leads to the precise definition of the terms *convex* and *simply connected*.

The rule $v-e+f=2$ also does not apply to certain star polyhedra.

LAKATOS refers to such examples as *monsters*, which, while they must be excluded (*monster barring*), do not constitute a genuine counterexample. Rather, they contribute to the precision of the concepts (*monster adjustment*) and encourage closer investigation (*exception handling*). The polyhedra with shared contact surfaces or edges, as well as self-penetrating bodies, examined in the following discussions in the fictitious classroom, also contribute to the precision of the conditions.

For him, proofs that turn out to be false due to counterexamples are not a "disgrace", but rather – from a scientific perspective – have always proven to be fruitful. Mathematical theorems (except those derived from axioms) cannot be considered *definitively* true in this sense; one can merely state that – at least so far – no counterexample has been found.

This process of *proofs and refutations* makes mathematics a quasi-empirical science (similar to the natural sciences); it gives it a more experimental character, through which our knowledge is increased. For LAKATOS, the history of mathematics is a *history full of intelligent errors*.

The response to LAKATOS' publications was very varied: while supporters of a more formalistic viewpoint did not feel represented by his theses, educationalists found his explanations inspiring for lively mathematics teaching.

Despite support from his former mentor KARL POPPER and other prominent figures, LAKATOS was denied naturalization in the United Kingdom – the British domestic intelligence agency MI5 mistrusted the former communist. Thus, the internationally renowned logic professor remained a stateless citizen until his death.

Along with KARL POPPER, THOMAS KUHN and PAUL FEYERABEND, LAKATOS is considered one of the great thinkers in the philosophy of science of the 20th century. In his memory, the LSE annually presents the *LAKATOS Awards* for outstanding contributions to the philosophy of science.

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https://www.spektrum.de/wissen/das-leben-und-werk-von-imre-lakatos/2267539

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