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Joseph **Fourier**

The eighteenth century *radiated* a *peculiar* kind of genius. It gave us people like Mozart, Jefferson, Euler, and Ben Franklin. Isaac Newton led us into the astonishing eighteenth century. And Joseph Fourier might well have been the last of those greats.

If you've studied math, heat flow, or acoustics, you've heard of Fourier. He was born in France in 1768. *Orphaned* at nine, he nevertheless *gained* an education in math and military engineering. Then he walked a slippery path through the politics of the French Revolution. He was jailed twice along the way.

As the dust cleared, Fourier joined the faculty of France's new École Polytechnique for two-and-a-half years. He was then *drafted* into foreign service and sent off on a ship to a secret posting with Napoleon Bonaparte. It turned out he was to be part of Napoleon's Egypt campaign – the Secretary of a so-called Cairo Institute, *charged with* answering a vast *array* of Egypt-related scientific and technical questions.

Napoleon *abandoned* his army in Egypt, returned to Paris, staged a coup, and claimed the leadership of France. He was already beginning his European *conquests* while his Egypt forces were collapsing. When they returned in *defeat*, Napoleon made Fourier the Prefect of Isère – kind of like an American state governor.

Fourier went to work with astonishing energy. He built roads and engineered a land-*drainage* program. He also wrote papers on mechanics. He wrote a book on Egypt. Meanwhile Napoleon's reign collapsed, and he was exiled to Elba. When Napoleon tried to return to power, Fourier fled. He'd had enough *entanglement*. Some people are more dangerous as friends than as enemies.

Fourier had started thinking heat flow long before, back in Egypt. In Isère, he'd *submitted* a study on the analytical theory of heat to the Academy of Science. He showed how to describe heat flow in solid bodies, but he did much more. He created a whole new form of *applied* mathematics. Using it, we'd now be able to solve problems that previously seemed far out of reach.

Like any masterpiece, the paper broke rules. Fourier's intuition led him where logic had a hard time following. The work *offended* many great mathematicians and, for fifteen years, he fought to get it published. When it came out until 1822, it was a full book - the most important mathematical work of that age.

Napoleon was now long gone, but Egypt *lingered*. That's where Fourier's lifelong obsession had begun – an obsession with heat, with its healing powers, and with its mathematical treatment. Fourier never married. But, among his close friends was the first great female applied mathematician, Sophie Germain. They corresponded for years and died only nine months apart.

But Fourier, having *succeeded* in altering the very character of both engineering and mathematics, spent his last days *swathed*, mummy-like in warm clothing, in his overheated Paris apartment. ■

Die Fourieranalyse ist wohl jedem bekannt der sich schon einmal mit Wellen jeglicher Natur befasst hat. Doch wer war Jean Baptiste Joseph Fourier?

abandon, to	*verlassen*
apply, to	*anwenden*
array	*Reihe, Anordnung*
charge with, to	*beauftragen*
conquest	*Eroberung*
defeat	*Niederlage*
draft, to	*einziehen (zum Militär)*
drainage	*Entwässerung*
entanglement	*Verstrickung*
gain, to	*erhalten, erzielen*
linger, to	*fortbestehen, bleiben*
offend, to	*beleidigen, vor den Kopf stoßen*
orphaned	*verwaist*
peculiar	*eigenartig, besonders*
radiate, to	*ausstrahlen*
submit, to	*einreichen, vorlegen*
succeed, to	*erfolgreich sein*
swath, to	*einwickeln*

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