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Obituaries

Alexander Grothendieck

Mathematician who was compared to Einstein but eventually turned his back on the academic world

Not since Russell and Wittgenstein half a century before had a prodigy seized the attention of the world of mathematics with the passion and force of Alexander Grothendieck. German-born, but raised in France, Grothendieck is credited in his adopted country with having reconstructed algebraic geometry and of being nothing short of the modern Euclid. Ordinary mortals, unable to grasp even the premises of his logic remain baffled, but to the tiny fraction of humanity versed in his theorems, he remains a giant.

Recondite, abstruse and arcane are the words that will spring to most people's minds in connection with Grothendieck's achievement. Americans would add "awesome", and they would not be wrong. One is reminded of the famous story about the physicist and mathematician Sir Arthur Eddington, accused of false modesty after failing to confirm that he was one of only three people who understood Einstein's theory of relativity. After a long pause, Eddington finally responded. "On the contrary," he said, "I'm trying to think who the third person is."

So it was with Grothendieck throughout his "golden age" of discovery — an age which came to an end, whether through burnout or exasperation, when he dramatically abandoned his work and spent the rest of his life as a recluse, revisiting the political activism of his parents. It is perhaps an irony that he is better known in France today as the father of *Zadisme*, the occupation by environmentalists of *zones à défendre*. Yet it will be as the most recent addition to the pantheon of French mathematicians, from Francois Viète to René Descartes and Henri Poincaré that he will find his place.

Libération, the leading left-wing French daily, noted in its appreciation, written by the paper's former editor, Philippe Douroux, that in his final 20 years Grothendieck was impossible to live with, or even know. Yet those who followed him, said Douroux, would be able to read, and possibly even understand, the marvellous drafts that he continued to produce to the end of his

Rumours abounded; some claimed he could be heard raging about the Devil

life "which sought to unravel the mysteries of the Universe, infinitely large and infinitely small, in which we live".

Alexander Grothendieck was born in Berlin in 1928. His Russian-Jewish father, Alexander Schapiro, had been imprisoned by the Bolsheviks as an anarchist before moving to then-liberal Germany in 1922, where, some years later, he embarked on an affair with the radical journalist Johanna Grothendieck, known as Hanka. The fact that Grothendieck was married at the time complicated the birth of their son, who was initially registered as Alexander Raddatz but later took his mother's name. She divorced her husband; though, in keeping with her anarchist principles, she never married Schapiro.

As the chaotic Weimar Republic gave way to the Nazis, life for the suspect couple and their child became risky. In 1933, shortly after Hitler was elected



Grothendieck in 1951 and, below, expounding his theories some years later



chancellor, Schapiro fled to France, followed some months later by Hanka. Alexander was left in the care of Wilhelm Heydorn, a Lutheran pastor in Hamburg, allowing the parents to travel to Spain, where they reported on the Civil War in support of the anarchists.

Franco's victory in 1939, which resulted in a mass-exodus of fighters and political dissidents across the Pyrenees, allowed Hanka to reclaim Alexander junior, who was 11-years-old and already showing signs of his intellectual curiosity. With his mother and, for a while, his father, he spent the Second World War in the village of Chambon-sur-Lignon, a former Huguenot stronghold in the Loire Valley that earned the rare distinction in France of protecting its Jewish residents. Notwithstanding the efforts of the villagers to hide him, Alexander Schapiro was arrested and sent to Auschwitz, where he died on an

unknown date in 1942. After such a miserable start in life, young Alexander was now granted a great gift. He was enrolled in the College Cevenol (since renamed Le Collège — Lycée Cevenol International), an extraordinary school, established by Protestant radicals, which provided him with a first-class grounding in the subject in which he clearly excelled — mathematics. After the end of hostilities, he studied at the University of Montpellier, where, after wrestling with issues thrown up by the rapidly evolving world of astronomy, he made quick progress, recalibrating, as it were, the Lebesgue Measure, a central feature of the understanding of volume within the Euclidean concept of space.

Moving to Paris in 1948, Grothendieck began work for his doctorate under the celebrated Professor Henri Cartan, a leading authority on algebraic

topology — the study of shapes and spaces — and differential calculus. Still just 20-years-old, Grothendieck found the master's seminars hard-going, but persisted. It was Cartan who suggested he transfer to the University of Nancy, to work with his colleagues Laurent Schwartz and Jean Dieudonné, under whose supervision he produced a dissertation on functional analysis. Four years later, in 1957, Grothendieck switched gears, moving into the fields of algebraic and homological algebra, relating algebra to space and — conversely — the absence of space.

Now endowed with a Wittgensteinian sense of his own uniqueness, Grothendieck was entering his most intense phase. His lectures and seminars at the Institute des Hautes Études in Paris were widely attended but, one suspects, little understood. His inner-core of disciples, including Michel Raynaud, Louis Verdier, Michel Demazure and Jean Giraud, were loyal and, by definition, well-equipped for the task, and together they helped make France once again an epicentre of global calculation.

By the late 1960s, Grothendieck was restless, perhaps even bored — though it is also possible that, as with Russell, his best work was behind him by the age of 35. He began to take an interest in biology and, partly as an act of homage to his parents, became almost fanatically involved in environmentalism, including the protest movement. The world, he could see, was poised between survival and destruction.

An increasingly devoted pacifist, he began refusing to take part in conferences supported by Nato or Nasa. He boycotted his 1966 Fields Medal ceremony in Moscow by way of protesting against the Red Army's presence in eastern Europe. He was later awarded the prestigious Crawford Prize for mathematics, worth some \$200,000, but refused to accept it. "Fertility is measured by offspring, not by honours," he said.

The defining moment when he abandoned his academic career came in 1970. He renounced his position at the institute after discovering that it received funding, albeit indirectly, from the French ministry of defence. From then on he spiralled into mental decline, eventually secluding himself in the Pyrenees and even severing ties with his family. He was married at least twice: with Mireille Dufour he had three children, whom he educated himself, having rejected the public school system. His second wife was Justine Skalba, an American mathematician, with whom he had one child. Little is known about any of his children.

By the Nineties he seemed to have disappeared. Rumours circulated about him: some said he had converted to Buddhism, others claimed he was living as a goat herder in the mountains and could be heard raging about the Devil.

As he grew old, he decreed that his papers should never be published and that any universities holding copies should withdraw them from public view. It is unlikely they will comply. Grothendieck's fate will see him regarded by generations of mathematicians as one of the greatest masters.

Alexander Grothendieck, mathematician, was born on March 28, 1928. He died on November 13, 2014, aged 86

Lives remembered

Sonia Rolt



Peter Foss writes: Sonia Rolt (obituary, Nov 8) was a remarkable writer. For many years she was active on the committee of the Cheltenham Literature Festival and

had been friends with writers and poets from Sir John Betjeman to Laurie Lee. She wrote many pieces for magazines but only one book, *A Canal People: The Photographs of Robert Longden* (1997), which I helped her with, acting as her amanuensis. She scribbled the drafts on her kitchen table and we would go through the text, tidying it up before putting it on the computer. We wanted to arrive at a narrative that reflected her unique angle on the world, her vivid memory of the people and scenes on the canals of the Forties and delivered in her distinctive voice. On sending it to the publisher, the blue pen went through much of this idiosyncratic style, but she stuck to her guns, threatened to withdraw the book, and got it published just as she wanted.

Charles Hargrove



Robert Elphick writes: Charles Hargrove (obituary, Oct 18) was the last of the great postwar foreign correspondents. He always stood out in the crowd even on

sweaty and hurried assignments accompanying General de Gaulle on his foreign excursions. I knew him when we used to attend gatherings at Peterhouse to drink with dons. His suits were never less than elegant; his ties always properly knotted. He knew everyone worth knowing in the political scene of most of the Continent and everyone knew him.

When he was pushed out of his job in Paris, he continued to live a full life in his beloved Normandy, riding his hounds until quite recently.

As well as his tailored suits and rolled umbrella, he always wore a bowler hat of a deep shade of brown.

Sir John Hoskyns



Lord Lexden writes: In a letter published in *The Times* on Nov 29, 2002, at the height of Gordon Brown's apparent economic success, Sir John Hoskyns (obituary, Oct 21)

predicted that ultimately it would fall to the Conservatives "to clear up the new Labour mess". Furthermore, he added, "They must prepare, in some detail, for their own 'mission impossible' — for the liberation and embourgeoisement of the inmates of Britain's welfare prison". This great architect of Thatcherism was as sharp as he was charming.

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