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## REBELLIOUS GENIUS: IN MEMORY OF ALEXANDER GROTHENDIECK

S. S. KUTATELADZE

Abstract. This is a short obituary of Alexander Grothendieck (1928–2014).



Grothendieck

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## S. S. KUTATELADZE

Alexander Grothendieck passed away in Saint Girons (Ariege) on November 13, 2014. We lost the mathematical dreamer of the twentieth century who has enlightened the roads to the mathematics of the future.

Grothendieck was born in Berlin on March 28, 1928. His father, Alexander Shapiro, was a Jew from Russia who was born in Novozybkov in 1899 and became a revolutionary, an anarchist, and a Makhnovist. The father miraculously escaped death during tsarism and under Bolsheviks, but was perished by Nazis in Auschwitz in 1942. As witnessed by Yuri Manin, Shurik (so Alexander was called in his family) kept his Russian language. Shurik's mother, whose surname became Shurik's since the farther had been pursued, was Hanka Grothendieck (1900–1957), a German and a distinguished left activist. She escaped with Shurik to France where Shurik's farther was interned from Spain where he had fought Francoists in Red Brigades. WWII spanned the years of ordeal that effected the whole life of the future genius.

Laurent Schwartz (1915–2002) was a supervisor of Grothendieck. His second supervisor was Jean Dieudonné (1906–2002) who later became an elder coworker, a friend, and even a pen of Grothendieck. Among the followers and students of Grothendieck we list Yuri Manin, Vladimir Voevodsky, William Lawvere, Pierre Deligne, Jiles Pisier and many other mathematicians of the first line.

The creative contributions and traits of personality of Grothendieck are exceptionally versatile. We list quite a few of the topics that await consideration:

- Grothendieck and the approximation problem
- Grothendieck spaces
- Grothendieck as an anarchist and revolutionary of mathematics
- Grothendieck and the revolution in set theory
- Grothendieck and the elimination and reincarnation of points
- Grothendieck and toposes
- Grothendieck and motives
- Grothendieck and the strength of abstraction
- Grothendieck and Lebnizianism
- $\bullet~$  Grothendieck as a student and tutor
- Grothendieck conscientious, tormented, and searching
- Grothendieck and meritocratism
- Grothendieck and the rise and decline of Bourbaki
- *Récoltes et Semailles* by Grothendieck<sup>1</sup>
- Grothendieck and the future of mathematics

It is customary to distinguish the main two periods of Grothendieck's mathematical research: from 1948 to 1956—the period of functional analysis and from 1956 to 1970—the period of algebraic geometry. This periodization brings about much injustice. Grothendieck remained a mathematician up to his terminal day, even after he had left IHÉS and returned to his *alma mater* in Montpellier. He had entered the history of science for ever as an unselfish and conscientious harbinger of mathematical dream and beauty:

...the only decisive proof of the fertility of ideas or of a new vision is that of time. Fertility is recognizable by offspring, not by honors.

A calamity will be fall the world that despise dream. Dream is deeper than all the other roots of our selves....

<sup>&</sup>lt;sup>1</sup>Cp. Genesis 8:22 in *La Bible Traduction Integrale Hebreu–Francais* by Bible Society, Books & Bagels, 1993.

## REBELLIOUS GENIUS

... the best of that I had managed to make in mathematics, everything that I worked upon with genuine zeal had come to me by itself—I had never drawn it by force. If mathematics has always brought me an ineffable joy and if my attraction to mathematics has never cooled in my ripe years, this happened not because I like to exercise my muscles while picking the green fruits that are firmly planted on branches. Not at all; I listen in an inexhaustible enigma and the impeccable harmony of spirit that belongs to mathematics and opens readily to a loving glance. This limitless depth attracts me to mathematics and the anticipation of beauty always stifles my breath.

Grothendieck bequeathed to descendants the mystery of his rebellious and restless personality. The motives of many of his acts will stay eternal challenges and puzzles. The man of utmost benevolence and openness, who donated to the others his own mathematical ideas and personal confessions, issued on January 3, 2010 a rather unusual, emotional, and muddled declaration in which he demanded to withdraw all his writings away from public access:

I do not intend to publish or republish any work or text of which I am the author, in any form whatsoever, printed or electronic, whether in full or in excerpts, texts of personal nature, of scientific character, or otherwise, or letters addressed to anybody, and any translation of texts of which I am the author. Any edition or dissemination of such texts which have been made in the past without my consent, or which will be made in the future and as long as I live, is against my will expressly specified here and is unlawful in my eyes.

Grothendieck left this world. Therefore, the restrictions he had imposed are not effective any longer, and the intellectual heritage of the genius is open to humankind.

Семён Самсонович Кутателадзе Институт математики им. С. Л. Соболева СО РАН, пр. академика Коптюга 4, 630090, Новосибирск, Россия *E-mail address*: sskut@math.nsc.ru