

## Chapter 3. Grothendieck in Algeria, Vietnam and Romania

At the end of the first chapter Grothendieck's political convictions were briefly mentioned, as well as the fact that until the middle of the sixties he did not undertake any concrete political action. These convictions first became apparent in the summer of 1966, when he refused to travel to Moscow in order to receive the Fields Medal at the International Congress of Mathematicians (ICM). He was protesting against the persecution and imprisonment of the two Russian authors Yuli Daniel and Andrei Sinyavsky.<sup>1</sup> His motives for this refusal were more "moral" than "political", and attracted a fair amount of attention. Indeed, a few years later the orthodox communists and socialists who played a large role in the students' movement held it against him.

As a political action, Grothendieck's gesture remains rather unconvincing. Stephen Smale, an American mathematician from Berkeley, also received the Fields Medal at this congress. His conduct was far more consistent and high profile. Much to the displeasure of the authorities he openly participated in public campaigns and demonstrations in Moscow.

Since Grothendieck was not himself traveling to Moscow, he asked Motchane to accept the medal for him, and the check that went with it. After Motchane's return Grothendieck declined even the most modest tribute, including an invitation to a private *dîner* at Motchane's house, but instead went to pick up the medal and check from the secretary of the institute. A newspaper article of the time reports that the French mathematician Grothendieck was awarded the Fields Medal - the "Nobel Prize" of mathematics, that he donated the prize money to the "*Mouvement du milliard pour le Vietnam*" to benefit the Red Cross of North Vietnam, and that the medal was to be sold at the next auction that this movement would organize. (Grothendieck does not seem to have made a big deal of this "utilization" of the Fields Medal. The author learned of it through this newspaper report, which is kept in the archives of the *IHES*. None of the people he interviewed were aware of it.)

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<sup>1</sup> Sinyavsky emigrated to France at the beginning of the seventies and became a professor at the Sorbonne. After Daniel was freed he remained in the Soviet Union.

In the second half of the sixties, Grothendieck went on lecture tours in Algeria and Vietnam, and twice in Romania. These were hardly places where he could hope to advance his own research. His acquaintances of the time are of the opinion that he undertook such trips out of a certain sense of duty. In these countries, where working conditions were particularly difficult, he wanted to lend support to mathematics and mathematicians. (A "sense of duty" was a powerful driving force during the writing of *EGA* and *SGA*.<sup>2</sup>)

Grothendieck's trip to Algiers, the Algerian capital, took place in November and December of 1965. Max Karoubi describes in a letter to the author how this visit came about:<sup>3</sup>

At that time (1965) the war in Algeria was over, and many French intellectuals wished to help Algerian universities. For example Roger Godement had visited Algeria several times in the past years, in order to build up an adequate mathematical library. He persuaded many mathematicians such as Serre and Grothendieck to come to Algeria to give a one month course. He also persuaded many young mathematicians (like myself) to do their "military service" in Algeria: this was then reduced to giving to a standard math course at the *Faculté des Sciences*.

In this context Grothendieck arrived in November 1965, and at the request of the mathematicians in Algeria he gave a course on category theory: *Introduction au langage fonctoriel*.

These lectures were written up, and in the introduction one reads:

This text contains succinct written notes of a series of lectures which Mr. A. Grothendieck kindly gave in the month of November 1965 in Algiers. Its aim is to familiarize beginners with the functorial language, a language which they will later see used in various seminars: Homological algebra in abelian categories and the foundations of K-theory [...]

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<sup>2</sup> For those readers who are not mathematicians it should be stated that *EGA* (*Elements de Géométrie Algébrique*) and *SGA* (*Séminaire de Géométrie Algébrique*) are fundamental texts of the refounding of algebraic geometry by Grothendieck.

<sup>3</sup> Karoubi also writes how generously and disinterestedly Grothendieck supported him in his own work: "I think the motivation of Grothendieck was simply generosity." This, however, belongs in a different book.

After his non-appearance at the Moscow conference, Grothendieck's trip to Hanoi and North Vietnam right in the middle of the Vietnam War was definitely a "political" action. The trip was made on his own personal initiative, and took place during the last three weeks of November 1967. (The first week of November was spent in the Hotel Khemara in Phnom Penh, Cambodia, waiting for an opportunity to continue his journey.)

Grothendieck gave an account of this trip on 20 December 1967 in Paris, in a lecture entitled "*La Vie Mathématique en République Démocratique du Vietnam. - (Exposé fait le 20 Décembre 1967, sur invitation du Département de Mathématiques de la Faculté des Sciences de Paris).*" An extensive twenty-two page written version of this talk is available. An (authorized) German translation also exists, and in April 1968, on the eve of the "Student Revolution" it was circulated by the student association of the University of Bonn.<sup>4</sup> Grothendieck tells of scientific and personal contacts, and describes his lecture program, the destruction caused by the war, bombardments, material difficulties, living conditions, and the Vietnamese people's confidence in their own future. He is cautiously critical of the indoctrination in dialectical materialism and the escalating regimentation of public life, but every sentence of his report reveals a deep sympathy with the efforts of the Vietnamese people to construct a new society under extraordinarily difficult conditions, and to support national education and science.

Grothendieck's lecture program was prepared in agreement with his Vietnamese colleagues. Ta Quang Buu, himself a mathematician and also the minister for higher and technological education, attended these lectures. The program, occasionally interrupted by airstrikes, consisted of the following events at the University of Hanoi:

- 11/13/1967: The education of mathematical researchers and  
the general requirements for scientific research
- 11/14/1967: The concept of a scheme
- 11/15/1967: Functional Analysis
- 11/16/1967: Homological Algebra
- 11/17/1967: Homological Algebra. Sheaf Theory

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<sup>4</sup> The people involved in the publication can no longer remember how contact with Grothendieck was established.

11/20/1967 (Algebraic) Topology

11/27/1967 and 11/30/1967: The Weil Conjectures

The sessions were then continued at the university, which had been evacuated to a location situated in the countryside at a distance of around a hundred kilometers. There was a two-day seminar on "topological tensor products and nuclear spaces" and a seven-day seminar on homological algebra. Each lecture was two hours long, but as every sentence had to be translated, the duration was doubled. Up to fifty people attended the lectures and all in all Grothendieck and his audience were extremely busy. Nevertheless there was only one case in which ongoing, long-term contact with a Vietnamese mathematician was kept up, namely the young mathematician Hoang Xuân Sinh. In the above mentioned account Grothendieck writes about her:

Madame Hoang Xuân Sinh, also from the Pedagogical Institute of Hanoi, took notes at all the lectures. She is one of the few mathematicians (and, what is even rarer, women mathematicians) who was educated in France (she passed her "agrégation" examination in 1959). These notes will later be written up and made available in French.

Sinh can be seen on several of the surviving photographs of Grothendieck's Vietnam trip. She returned to France in the seventies and earned her doctoral degree with Grothendieck. In *Récoltes et Semailles* (p. 150) Grothendieck refers to her with the following words:

[...] Mme. Sinh, whom I met in Hanoi in December 1967, on the occasion of a one-month course that I gave at the evacuated University of Hanoi. The following year I suggested a subject for her thesis. During the war her working conditions were particularly difficult, and her contact with me was restricted to an intermittent correspondence. She was able to come to France in 1974/75 (on the occasion of the International Congress of Mathematicians in Vancouver), and earned her doctoral degree with this thesis in Paris (the jury included Schwartz, Deny, Zisman, and myself, with Cartan as president).

During her stay in France, Sinh spent at least some amount of time in Montpellier. She received her doctoral degree at the university of Paris 7 with a thesis on  $gr$ -categories. There is no doubt that she belongs among those women who played a certain role in Grothendieck's life. On December 9, 1974 she sent Grothendieck a (very beautiful) little picture of herself, with a handwritten dedication on the back (see Chapter 14). Later she became

politically active and played a leading role in building up mathematics in Vietnam. Currently (2008) she is president of the first private university in Vietnam, which she herself founded in 1988, the Thang-Long University in Hanoi. It has not been possible to acquire more information. The author was only able to establish indirect contact with Sinh, and he was informed that she gave her word to Grothendieck never to disclose anything about his life or her encounters with him to anyone.



In Vietnam 1967, Hoang Xuân Sinh in front of Grothendieck to the right

Although French intellectuals, including many prominent ones such as Jean-Paul Sartre, had been campaigning for the liberation of Indochina for quite some time already, in all probability Grothendieck's spontaneous trip to Vietnam was an "individualistic", independent action typical of him. Many mathematicians became involved in this issue, with Grothendieck's thesis adviser Laurent Schwartz at the forefront. In Chapter 10 of his autobiography, Schwartz gives a detailed account of the struggle for an independent Vietnam, and tells of his love for the country and its inhabitants.<sup>5</sup> He had dealings with many prominent politicians, among others the Vietnamese Prime Minister Pham Van Dong, and with Ho Chi Minh

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<sup>5</sup> L. Schwartz: *Un mathématicien aux prises avec le siècle*, Paris 1997; English translation; *A Mathematician Grappling with his Century*, Basel 2001.

himself. It is not clear however, how much Grothendieck even knew of these other campaigns and initiatives.

Regarding the "great turning point", one can in any case conclude that at this time, the idea that mathematical activities could be dangerous for society, or even that other things might be more important than mathematics, had not yet surfaced in Grothendieck's mind. Quite the contrary, in fact: only a scientist profoundly convinced that what he was doing was right would lecture on the Weil conjectures in the Vietnamese jungle under the threat of American bombs. Some might ask if at such a time these lectures perhaps did not fulfill the real needs of the people. Grothendieck himself became aware, during this trip, that there was a whole world outside of mathematics. He summarizes this in the following words:

Possibly the strongest of the many impressions that I brought back with me from my stay in the DRV [Democratic Republic of Vietnam], is the calm confidence in the future which I noticed in everyone with whom I was able to speak. This confidence is clearly not a facade presented to foreigners or to one another, but a deep and very real feeling that has its origins in the Vietnamese people's thirty-year fight for independence and for the construction of a new society. It can not be shaken - quite the contrary - by the fact that the country's cities and industrial facilities were for the most part destroyed by the Americans as the war expanded. This experience has shown them that even under such circumstances one can lead a reasonable and socially useful life [...]

Grothendieck's first trip to Romania came about through an invitation dated 17 March 1968 from Miron Nicolescu, president of the Romanian Academy of Sciences. He himself was a well-known mathematician who had studied in France and gained his Ph.D. under the supervision of Montel. It is altogether possible that the invitation was his own idea, but presumably Grothendieck's personal friend Ionel Bucur also had something to do with it.<sup>6</sup> It is common knowledge that mathematics in Romania received exceptional support under Ceaușescu's Stalinist dictatorship. On April 12,

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<sup>6</sup> Ionel Bucur (1930-1976) was responsible for publicizing Grothendieck's ideas in Romania. He was the "mentor" of a younger generation of mathematicians who were interested in algebraic geometry. He spent a year circa 1967/68 at the IHES. During this time he made friends with Grothendieck and his family. He later participated in editing SGA 5. Grothendieck writes cordially of his friend in *ReS*.

1969 Grothendieck wrote a short report on this trip, which had taken place in the last week of March. He held two lectures in Bucarest on the subject "*Méthodes transcendentales et méthodes arithmétiques en algèbre et en géométrie*". Subsequently he went on an excursion to Braşov (Kronstadt) with some young Romanian mathematicians. In the report he praised the level of science in Romania and summed up with a proposal for regular contact. He particularly mentioned his meeting with Gheorghe Lusztig and Dan Burghelea, and their extraordinary talent.

He had in fact met Lusztig at the IHES a short time previously, in December 1968. Lusztig had been working with Atiyah in Oxford, and stayed in Bures for a few days. There he had the opportunity for in-depth discussions with Grothendieck and was invited to dinner at his house, where he met not only Grothendieck's wife Mireille, but also a refugee hosted by Grothendieck. In March of 1969 Lusztig, now back in Timişoara where he lived, suddenly received a telephone call with the news of Grothendieck's trip. He traveled to Bucarest and arrived just in time for Grothendieck's lecture. Grothendieck appeared in shorts, which must have somewhat alarmed the officials of the Romanian Academy. Lusztig himself left Romania shortly thereafter for good.

At that time, Dan Burghelea had also already spent some time in the West. He had met Grothendieck in 1967 in Bures, and was now on the brink of permanently leaving Romania. What he writes<sup>7</sup> typifies the esteem which Grothendieck had acquired among the younger generation. We quote from his testimony not only regarding the trip to Romania, but more generally as a testament to Grothendieck's reputation in the mathematical community:

In Romania he was already regarded as a mathematician of mythical proportions. He was regarded as the most influential mathematician of our time [...] Although my mathematics was not very close to his, Grothendieck was my hero; at that time (1965 - 1975) I regarded him as the most remarkable mathematician of our time [...] His personality, a combination of warmth, aggressiveness, high standards, his generosity towards beginners and reputation for toughness with the establishment made him a hero [...] When he came to Romania I was very proud that he knew about my work with Kuyper. I tried to be around him as much as possible.

Burghelea also makes a most appropriate comment on the "famous" bare

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<sup>7</sup> e-mail from February 2009.

feet in sandals:<sup>8</sup>

[...] To me this was associated to his scientific spirit. To use only what is strictly necessary, but still makes you comfortable, ignoring the constraints convention might impose, and why not, having the courage of behaving differently.

The second trip to Romania took place in June 1970, at the precise time when Grothendieck began to turn away from mathematics and towards ecology. We will therefore give an account of it in Chapter 5.

If during the course of this chapter there have been references to Grothendieck's "political" activities, then we must stress once more that these were certainly not the central focus of his interest. These political actions, like so many other things in his life, seem contradictory. Since the time of the Indochina War and the Algerian War, French intellectuals, including many mathematicians, had become involved in the "leftist" opposition. At the forefront was Grothendieck's thesis director, Laurent Schwartz; not only was he active on the Vietnam issue, but he was also an initiator of the Russell Tribunal in Stockholm and Roskilde. In his autobiography he cites among his fellow campaigners many prominent mathematicians of French and other nationalities: mathematicians such as Kahane, Malgrange, Cartier, Martineau and Smale. But the name of Grothendieck is only briefly mentioned. In those years Grothendieck had no interest in collective organized political action; he did not take part in any, and perhaps this type of action even left him indifferent. Everyone who has followed his political actions attests to his good will and his serious and honest goals, but also to an unbelievable naiveté and inexperience.

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<sup>8</sup> Going around barefoot seems to have always been a need for Grothendieck. In a group photograph of children from the home *Le Guespy* in Le Chambon-sur-Lignon, Grothendieck can be seen barefoot (without sandals.) To judge from the rest of the clothing (thick sweaters and jackets) it could certainly not have been summer.