DEPT. OF SCIENCE MAY 16, 2022 ISSUE

THE MYSTERIOUS DISAPPEARANCE OF A REVOLUTIONARY MATHEMATICIAN

Alexander Grothendieck was revered for revealing connections between seemingly unrelated realms. Then he dropped out of society.

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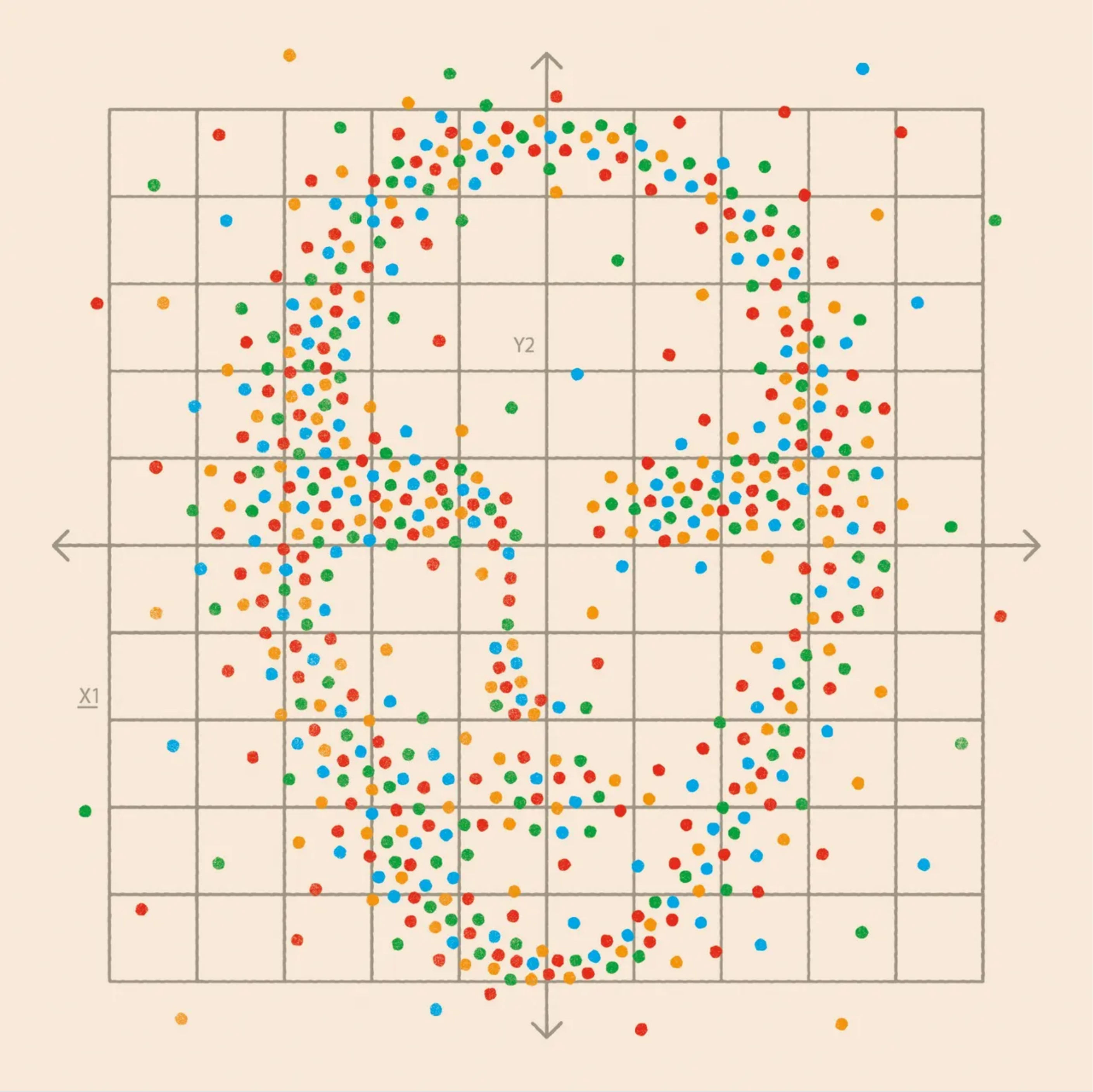
May 9, 2022



“Whole fields of mathematics speak the language that he set up,” a professor said. Illustration by Lauren Peters-Collaer

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While living in an internment camp in Vichy France, Alexander Grothendieck was tutored in mathematics by another prisoner, a girl named Maria. Maria taught Grothendieck, who was twelve, the definition of a circle: all the points that are equidistant from a given point. The definition impressed him with “its simplicity and clarity,” he wrote years later. The property of perfect rotundity had until then appeared to him to be “mysterious beyond words.”

Grothendieck became a revered mathematician. His work involved finding the right vantage point—from there, solutions to problems would follow easily. He rewrote definitions, even of things as basic as a point; his reframings uncovered connections between seemingly unrelated realms of math. He spoke of his mathematical work as the building of houses, contrasting it with that of mathematicians who make improvements on an inherited house or construct a piece of furniture. Colin McLarty, a logician and philosopher of math at Case Western Reserve, told me, “Lots of people today live in Grothendieck’s house, unaware that it’s Grothendieck’s house.” The M.I.T. mathematician Michael Artin, who worked with Grothendieck in the early sixties, laughed when I asked him about Grothendieck’s contributions. “Well, everything changed in the field,” he said. “He came, and it was like night and day. It was a revolution.”

When Grothendieck was forty-two years old, he abruptly left the field of mathematics. For a while, he still did occasional private mathematical work —“to my own surprise, and despite my long-standing conviction,” he later wrote, “that I would never publish a single new line of mathematics in my lifetime.” By the time he was sixty-three, his whereabouts were known by almost no one. Nor was it known whether he was still pursuing solutions to the problems that had obsessed him for decades. Stories circulated of a bearded man wearing a long robe, hermited away somewhere in the Pyrenees.

Grothendieck wrote that his central work had been cruelly abandoned by others—but that wasn’t entirely true. Research was still ongoing in mathematical domains termed “Grothendieck universes,” and although his work wasn’t always cited, his methods were used so often that to cite him would be like citing Leibniz or Newton every time you used calculus. In

1992, two mathematicians, Leila Schneps and Pierre Lochak, decided that they would find Grothendieck.

The mathematical house builder Alexander Grothendieck was born in March, 1928, in Berlin, to Alexander Shapiro and Hanka Grothendieck. Hanka was married to a different man, so the child's last name at birth was Raddatz. Shapiro, who went by Sascha, came from a middle-class Hasidic family, against whom he had rebelled. Hanka had left behind a well-off Protestant family. Both parents were anarchists. Sascha had been imprisoned in Russia for his involvement in the 1905 revolution; he lost an arm after being shot during one of his attempted escapes.

In 1933, Sascha left Berlin and moved to Paris, and Hanka followed soon afterward. They left Alexander in Hamburg, with a family that took in children. Maidi, his half sister via his mother, was put in an institution for disabled children, though she was not disabled. Sascha and Hanka spent some time in Spain, during the civil war. They wrote only a handful of letters to their children.

By 1939, the family that had taken Grothendieck in had grown concerned. Grothendieck looked Jewish. They located Sascha and Hanka, and the boy was put on a train from Hamburg to Paris. Shortly after Grothendieck's reunion with his parents, whom he hadn't seen in six years, Sascha was sent to an internment camp outside the city. (He later died in Auschwitz.) The mother and child were sent to Rieucros, a camp in the south. "The administration of the camp turned a blind eye toward the kids, however undesirable they might be," Grothendieck writes in "Récoltes et Semailles" ("Harvests and Sowings")—a manuscript of more than a thousand pages that was recently published, by Gallimard, in France. "We came and went as we pleased. I was the oldest, and the only one to go to school. It was a four- or five-kilometre-long walk, often in rainy and windy weather, wearing makeshift shoes that always got wet." Grothendieck makes almost no other mention of the camp. He follows its description with a long paragraph about a teacher who unfairly gave him a bad grade for a math proof that he did in his own way, ignoring the textbook. He also decries his textbooks as lacking "serious" definitions of length, area, and volume.

For many years, Grothendieck idealized his parents. He identified closely with his father, with whom he had spent very little time, and whose biography he sometimes conflated with that of another Alexander Shapiro, a famous anarchist of the same era. Grothendieck recalled that as a child he loved rhymes, feeling that their sonic connections pointed to a mystery beyond words. For a time, he spoke exclusively in rhymes, "but fortunately," he wrote fifty years later, "that period has passed."

After Grothendieck had spent two years in Rieucros, a Protestant activist organization negotiated with the Vichy government for the release of some of the internees. Grothendieck was separated from his mother and housed as a refugee in Le Chambon-sur-Lignon, an Alpine area famous for centuries of resistance to repressive governments. Many of the local residents were cowherds. There, some five thousand "undesirables," mostly children, were successfully hidden from the Nazis. The staple food was boiled chestnuts, which was served three times a day. Mushrooms or chicken was added if available. Sometimes the children were sent to the woods to hide for a few days.

If Grothendieck's childhood was characterized by the fairy-tale aspect of being in a dark wood without parents, then his early adult life was also like a fairy tale, as obstacles were repeatedly overcome with almost magical ease. After the war, Grothendieck reunited with his mother and attended the University of Montpellier. He worked in the vineyards to support himself and Hanka, who was weak from tuberculosis, which she had contracted at Rieucros. While at the university—which was not an important center of mathematics—Grothendieck independently pursued research on ideas having to do with measures, a field that less gifted students might dismiss as obvious.

He ended up rediscovering a celebrated problem, Lebesgue's theorem. From that moment forward, Grothendieck thought of himself as a mathematician.

He went to Paris and studied with the most important French mathematicians of the time, including Laurent Schwartz, who would soon be awarded a Fields Medal, the highest award in mathematics. At the end of a paper co-authored by Schwartz, fourteen questions were listed. "Many of those questions, individually, would have been enough for a Ph.D.," the mathematician Pierre Cartier said. In a short time, Grothendieck solved them all.

A more pedestrian problem was that Grothendieck was stateless. He had a right to French citizenship but did not avail himself of it, because that would mean he could be conscripted into the military. (When Grothendieck was later invited to visit Harvard, he almost didn't get a visa, because he refused to pledge not to attempt to overthrow the United States government; he said that he would be fine going to jail in the U.S., so long as he had access to as many books as he wanted.) Without French citizenship, he could not be hired at French universities. He worked in the math department of the University of São Paulo for two years, where he told people that he ate only bananas, bread, and milk, "so as not to lose any time over it." He then spent a year at the University of Kansas, and while there did work that culminated in a paper now known as the *Tohoku* paper, for the Japanese math journal in which it was published. The paper broadened spectral sequences—a fundamental tool in algebraic topology—and made them more powerful. Grothendieck's contributions may sound like Martian language to non-mathematicians, but the connections revealed in his work were dramatic. "Spectral sequences wasn't even seen as a subject on its own two feet," Barry Mazur, a mathematician at Harvard who was friends with Grothendieck in the nineteen-sixties, told me. "It's more of a technique. But Grothendieck didn't approach anything as a mere technique."

Mazur suggests that it's possible to glimpse the essence of Grothendieck's approach to mathematics by looking at two concepts—categories and functors. A category can be thought of almost as a grammar: take triangles, perhaps, and understand them in terms of their relationship to all other triangles. The category consists of objects, and relationships between objects. The objects are nouns and the relationships are verbs, and the category is all the ways in which they can interact. Grothendieck's discoveries opened up mathematics in a way that was analogous to how Wittgenstein (and Saussure) changed our views of language.

A functor is a kind of translation machine that lets you go from one category to another, while bringing along all the relevant tools. This is more astonishing than it sounds. Imagine if math could be translated into poetry, and somehow it made sense to take the square root of a stanza.

The mathematician Angela Gibney describes Grothendieck's vantage point in a way that I find particularly approachable: if you want to know about people, you don't just look at them individually—you look at them at a family reunion. Ravi Vakil, a mathematician at Stanford, said, "He also named things, and there's a lot of power in naming." In the forbiddingly complex world of math, sometimes something as simple as new language leads you to discoveries. Vakil said, "It's like when Newton defined weight and mass. They had not been distinguished before. And suddenly you could understand what was previously muddled."

As a young man, Léon Motchane studied mathematics and physics in Russia, but after the Revolution he had to give up his studies to help support his family. He worked in insurance and banking, and lived in France. In 1958, he founded the Institut des Hautes Études Scientifiques, in Bures-sur-Yvette, about an hour outside Paris. I.H.E.S. is similar to the Institute for Advanced Study, in Princeton, which Motchane had visited. Part of the guiding principle behind both institutions is that scientific thinking can be nourished in a community, where ideas are worked out through conversations and connections between people. When putting I.H.E.S. together, Motchane contacted the elder statesman of mathematics Jean Dieudonné, who was as revered as his name had destined him to be. Dieudonné had been a founding member of Bourbaki, a group of mathematicians in France who were collectively rewriting the foundations of mathematics, and signing the work N. Bourbaki. (They once sent out invitations for the wedding of N. Bourbaki's daughter, who was marrying a lion hunter named Hector Pétard.)

Dieudonné agreed to accept a position at the newly formed I.H.E.S., on the condition that Motchane also hire Grothendieck. Initially, the two of them constituted the paid staff of I.H.E.S., and mathematicians came down from Paris to attend a weekly seminar. Grothendieck's hiring followed the death of his mother, in 1957. By the end of 1959, he was in a relationship with Mireille Dufour, who had cared for his mother. At I.H.E.S., Dieudonné set aside what he was working on in order to be a kind of scribe to Grothendieck. It was as if Matisse had set down his paintbrushes to assist a young Picasso. Nearly twelve golden years of mathematics followed, and thousands of pages of foundational theorems.

Grothendieck's I.H.E.S. seminar met on Tuesdays. Sometimes he would ask someone else to lecture. "He had this incredible ability to ask the right person to do the right thing," the mathematician Nick Katz, of Princeton, said. Katz went to I.H.E.S. as a young mathematician in the late sixties. "Grothendieck was engaged in this wonderful project, and to be asked to be a part of it—it was like Jesus asking you to be a disciple."

The "wonderful project" consisted of looking at algebraic geometry from a new point of view. This was motivated partly by trying to find a solution to the Weil conjectures, an idea that the mathematician André Weil (also a Bourbakist) described in a letter to his sister, the philosopher and mystic Simone Weil, written while he was serving time in a military prison for failing to report for duty in the French Army. (The conjectures were formally introduced in a paper in 1949.) Weil's conjectures detailed unexpected correspondences between the mathematical fields of number theory and topology. He showed that the number of solutions to certain polynomial equations—you may remember in high school trying to solve for *x* and *y* and coming up with more than one possible solution—was related to the number and kinds of holes in a geometric visualization of the solutions to the equations, and that this seemed to be true for equations in two dimensions or seventeen dimensions or a million dimensions. But Weil's conjectures were conjectures. Grothendieck saw a way to prove them, using what are called schemes, sheaves, and motives. Sheaves were a mathematical bundling system of sorts, also developed during an incarceration: Jean Leray came up with the system while he was a prisoner of war.

"What Grothendieck would do is work until late in the night writing up his thoughts, and then throw them downstairs to Dieudonné at 5 A.M., who would then clarify and fill out what Grothendieck had put together until 8 A.M. or so," McLarty told me. Vakil describes the experience of reading the texts that came from that time as "scriptural." He said, "Every single sentence is obvious, based on what came before. In that way, it's simple."

Many people who knew Grothendieck during his time at I.H.E.S. speak of his kindness, his openness to any kind of question, his gentle humor. He was often barefoot. He fasted once a week in opposition to the war in Vietnam. Mazur recalled that Grothendieck had met a family at the local train station with nowhere to stay, and he invited them to live in the basement apartment of his home. He had a machine installed that helped make taramosalata—a fish-roe spread—so that they could sell prepared food at the market.

Grothendieck spoke of problem-solving as akin to opening a hard nut. You could open it with sharp tools and a hammer, but that was not his way. He said that it was better to put the nut in liquid, to let it soak, even to walk away from it, until eventually it opened. He also spoke of "the rising sea."

One way to think of this: there's a rocky and difficult shore, which you must somehow get your boat across. There may be a variety of ingenious engineering feats that can respond to this challenge. But another solution is to wait for the sea to rise, providing a smooth surface to cross effortlessly. The mathematician and writer Jordan Ellenberg said of his first encounters with Grothendieck's work on schemes, "Once you see it set up this way, it doesn't read like a style or trend. It feels inevitable, like: This is what it is." Grothendieck's rewriting of foundations can seem complex and difficult, but only because, Ellenberg said, they were previously described in the wrong terms. "We have a word for difficult, and a word for easy, but we need a word for something about which it is difficult to understand that it is easy."

Grothendieck almost never worked with specific examples. It has been said that once, when he was asked to use a prime number to demonstrate something on the blackboard, he said, "You mean an actual number? O.K., take fifty-seven." Fifty-seven is not a prime number—it's nineteen times three—and it is now known as Grothendieck's prime.

Grothendieck returned students' drafts of papers with extensive markings, including comments on word choices and where a comma should go. The mathematician Luc Illusie described how, after submitting pages, he would go to Grothendieck's home in the afternoon and sit side by side with him for hours, going over each comment, stopping only for tea and dinner. "Some students were overwhelmed by this, or discouraged, but, to me, I saw him as a very sweet man," Illusie said.

Still, a sharper side of Grothendieck was increasingly visible. Mazur, who worked at I.H.E.S. at the time, explained that Grothendieck had become an ardent environmentalist. He wouldn't let his wife, Mireille, drive a car, "though he himself had a motorbike to get to and from the institute," Mazur said. No car meant that shopping for groceries was difficult for Mireille, who took care of their three young children. (When the children complained about school, Grothendieck told them to do what interested them; none of them graduated from high school.) Mazur remembered a meal that he and his wife, Gretchen, hosted at their home near I.H.E.S., in May, 1968. Before the dinner, they learned that Grothendieck had become a vegetarian. "We had never known any vegetarians—it was new for us," he said, laughing. So they went into Paris to go to Fauchon, the high-end grocery store. "You could get bulgur wheat that was labelled 'bulgur wheat.' It was that kind of place." It was the time of the student uprisings, when riots and riot squads were common. The Mazurs were conscious of making their way to an élitist grocery, which presumably Grothendieck would have been against. "We probably spent one-third of our monthly salary there," Mazur said.

The Grothendiecks arrived. Mazur told me, "He came in and saw the spread and said with a big smile, 'This is wonderful!' " And then he turned to Mireille and said in a harsh voice, "See how easy it is to make a vegetarian meal!" "That kind of turn was very characteristic of Grothendieck," Mazur said. "That's why I'm telling you this story. And, how should I put it? It affected all of his friendships, eventually. All of his relationships." Of the taramosalata-making family, Mazur added, "Of course, it was Mireille who had the burden and responsibility of taking care of all those people."

In 1970, Grothendieck abruptly left. He left the I.H.E.S., he left the twelve to sixteen hours a day of thinking about math, he left his wife and his three children. His work on the Weil conjectures was not yet complete:

his theory had solved only three of the four conjectures. His stated reason for leaving was that he had found out that five per cent of the I.H.E.S.'s funding was coming from the French ministry of defense. But those who knew him say they felt that this could have been resolved and was not the real reason. Some recall that in 1968, when he tried to speak to striking students, he was disturbed to realize that they saw him as a mandarin figure of the institution —not as the outsider he saw himself as. Grothendieck knew an enormous amount about math, but little about himself or anything else. His mentor Jean-Pierre Serre—whom Grothendieck named as the origin of all his most profound mathematical contributions—later wrote to him, "I have the impression that, despite your well-known energy, you were quite simply tired of the enormous job you had taken on. . . . Did you not come, in fact, around 1968-1970, to realize that the 'rising tide' method was powerless against this type of question"—the solving of the fourth conjecture, for example—"and that a different style would be necessary?" Whatever the actual reason was, Grothendieck encouraged his colleagues to leave, too, telling them that mathematics was a siren song keeping them from what they should be doing —though, as with his mathematics, he was spare on the specifics.

Grothendieck devoted himself to a new project, Survivre et Vivre, which aimed to save the planet and the human species. He was particularly drawn to Arthur Koestler's language about "sleepwalking toward Armageddon," and he described scientists and mathematicians as the most dangerous people on the planet, because they carelessly put destructive technological power in the hands of politicians. For about two years, he was the primary contributor to a monthly newsletter called *Bulletin de Liaison*, signing some of his pieces with the pseudonym Diogenes.

Grothendieck also envisaged a commune, in a house with at least twelve rooms, which would have "the warmth of a family environment." In 1972, this idea became a reality, in the town of Châtenay-Malabry. He began dating a mathematician, Justine Skalba, whom he had met at a talk at

Rutgers; soon afterward, she agreed to leave her studies and follow him. The commune, founded with friends, started with only four people, but others came and went, and sometimes meetings were held on Survivre issues which attracted up to a hundred people. Grothendieck sold sea salt and organic vegetables, but others called him "the bank," because he was the source of all cash. The commune fell apart within a year. Skalba had a child. By the time the child, John, was two months old, she had left Grothendieck; John grew up having almost no relationship with his father and went on to study math at Harvard—he took a class taught by Mazur—before becoming a scientist who works with A.I.

Grothendieck eventually took a teaching position at Montpellier, which was still not an important center of mathematics. "After a few years of intensive anti-military and ecological campaigning of the 'cultural revolution' type, that you have certainly heard echoes of here and there, I basically disappeared from circulation, lost at some provincial university God knows where," Grothendieck wrote in the eighties, in an application for a research position, so that he would no longer have to teach. "Rumor had it that I spent my time keeping sheep and digging wells. The truth is that apart from numerous other activities, I was valiantly lecturing at the university just like everybody else." He ended the application, which he called "Sketch of a Program," by writing, "Today I am no longer, as I used to be, the voluntary prisoner of interminable tasks, which so often prevented me from springing into the unknown, mathematical or not. The time of tasks is over for me. If age has brought me something, it is lightness."

It is said that the ancient Greek mathematician Pythagoras made pronouncements on numbers from behind a curtain. His followers, the cult of Pythagoras, conducted their research with the enthusiasm of spiritual seekers. They ate bread, honey, vegetables, and seeds, avoiding meat. When one follower demonstrated logically the existence of irrational numbers—numbers that cannot be expressed as a fraction, and that continue on indefinitely when expressed in decimals—the Pythagoreans are said to have taken the infidel out on a boat and tossed him overboard. Mathematicians take their ideas of beauty and purity pretty seriously. The mathematician Paul Erdős used to refer to particularly elegant proofs as "straight from the Book," meaning the book of God (though he doubted God's existence, and would refer to him as the SF, for Supreme Fascist).

Around 1985, mathematicians who had known Grothendieck began to receive fragments of a manuscript, along with personal letters. This was "Récoltes et Semailles," subtitled "The Life of a Mathematician; Reflections and Bearing Witness." To an outsider like me, it's a coherent and imaginative piece of writing that is also, in its obsessiveness, deranged. To those who knew Grothendieck, it was more distressing. One mathematician has said that he preferred to read it as a novel, because the narrator seemed to be in so much pain. A substantial part of "Récoltes et Semailles" is a jeremiad, describing a degraded mathematical community intent on burying Grothendieck. It also speaks of a select number of visionaries, whom he terms Mutants.

Jean-Pierre Serre received a section of the manuscript, and responded in a long letter that includes the following passage:

> You are surprised and indignant that your former students did not continue the work which you had undertaken and largely completed. But you do not ask the most obvious question, the one every reader expects you to answer: why did you yourself abandon the work in question?

The former student whom Grothendieck particularly vilified was widely recognized as his most brilliant: Pierre Deligne. But Deligne had wronged him through an ingenious piece of mathematics. Four years after Grothendieck left the I.H.E.S., Deligne had proved the fourth and final Weil conjecture. "But he solved it the wrong way," Michael Artin said, with an impish smile—he didn't use the foundational system that Grothendieck had established. Ravi Vakil told me that mathematicians sometimes describe this moment with an analogy: "It was as if, in order to get from one peak to another, Deligne shot an arrow across the valley and made a high wire and then crossed on it." Grothendieck wanted the problem to be solved by filling in the entire valley with stones. He wrote about a dream in which he was "cut deeply in many places." When he awoke, he said, he realized that this image of "massacre" had made clear the "reality of intentions and dispositions of others that I had strongly perceived."

"Récoltes et Semailles" is repeatedly framed in terms of childhood. The mathematical ideas that Grothendieck felt were abandoned are called "orphans." Among the section titles are "Toward the discovery of the Mother," "The tome and high society—or the moon and green cheese . . . ," and "Death is my cradle (or three toddlers for one moribund)." Yet there is very little talk of Grothendieck's actual childhood, or mother, or father. The other theme used repeatedly in section titles is death: "A wind of burial . . . ," "Gangrene—or the spirit of our times," "The Posthumous student," "The funeral," "The coffin," "Encounters from beyond the grave," "The massacre," and ". . . and the chainsaw."

In 1991, Leila Schneps, a young American mathematician, was handed a manuscript copy of Grothendieck's 1984 application, "Sketch of a Program," by another mathematician, Pierre Lochak. "Maybe it was a pickup thing for mathematicians," she said, smiling. "Pierre is now my partner." She was aware that Grothendieck was a very general thinker. "I do number theory, which is abstract, but I like to work with mathematical objects, if that makes sense," she said. "So it's not as abstract. I didn't think I would be drawn to Grothendieck's work."

But, when she read the manuscript, she found it to be incredibly beautiful: "One idea in there is that we have been writing math in a way that is all wrong." Grothendieck argued that mathematicians hide all of the discovery process, and make it appear smooth and deductive. "He said that, because of this, the creative side of math is totally misunderstood. He said it should be written in a different way, that shows all the thinking along the way, all the wrong turns—that he wanted to write it in a way that emphasized the creative process."

Schneps was also captivated by other late work of his, about what are called *dessins d'enfants:* "It's this idea that any simple picture, made of vertices and segments—whatever you can draw in this way—that there's a natural connection between each and every one of these drawings and an actual equation with coefficients that are algebraic numbers—and this is so weird." This involved an area of math called Galois theory, which Schneps also worked in. "He saw that the absolute Galois group acts on these drawings. And then he did something that I find so touching. He actually drew it. He drew these little drawings. Grothendieck did not do examples, of course—and here he was, doing an example, something concrete." Schneps thought, O.K., this is for me. She and Lochak went searching for Grothendieck.

By then, he was living as a hermit, at times subsisting only on dandelion soup. He kept his address a secret so that he would not be found. Schneps and Lochak spoke to a couple of thin, bearded men, one of them living in a shack in the middle of a wheat field. "He said he would leave us to decide inside our soul whether he was Alexander Grothendieck," Schneps said. He wasn't Alexander Grothendieck. They journeyed up to a hut in the mountains to meet another thin, bearded hermit; he also was not Grothendieck. The area, which was not too far from where Grothendieck had hidden in the woods as a child, was a magnet for people who were living outside traditional systems, or without official paperwork. Finally, they found yet another thin and bearded man, buying vegetables in the market—the true Grothendieck.

A tremendous, demanding, tumultuous friendship was struck up. "Sometimes he was so nice. Other times, we would knock on his door and he would slam it in our faces, or he would tell us that we were messengers of Satan," Schneps said. She recalled that, if a leaf broke off a plant in his home, he would place the fallen leaf in its own glass of water. He told Schneps and Lochak that he and the plants could communicate. "I think he was very lonely," she said. He was preoccupied with the problem of evil and felt that, when people set aside what they were doing and focussed on this, the evil would end. "I don't think he was crazy," she said. "Look at us chatting away here, with everything going on in Ukraine." It was the end of February. "He would say that we are the ones who are crazy." She and Lochak attempted to visit him each year. At times, he would gather a basket of apples from his yard to give to them; at other times, he would accuse them of trampling on him. He never spoke with them about mathematics.

Schneps and Lochak, along with friends, founded the Grothendieck Circle, a group devoted to preserving and making accessible as much of Grothendieck's work as possible. Schneps also organized a conference around his work, and collaborated with the mathematician Winfried Scharlau, who has written a deeply researched biography.

Grothendieck's work also survives as the structure in which much of math happens today. When Fermat's Last Theorem was proved, by Andrew Wiles, in 1994, Grothendieck's contributions to algebraic geometry were essential. Ravi Vakil said, "Whole fields of mathematics speak the language that he set up. We live in this big structure that he built. We take it for granted—the architect is gone."

Schneps recalled that, in one of her visits to Grothendieck before his death, in 2014, he explained his conviction that lived experience could lead one intellectually astray. "As I told you, he never started from examples, and this was the way he thought about everything, not just mathematics," she said. And so the example of his own life was something that he didn't want to take