

Chapter 2. Country mouse, city mouse: 1947-1949

Alexandre Grothendieck became visible to the radar of the mathematical world only after his arrival in Nancy, in the fall of 1949. Although he spent the academic year 1948-1949 in Paris, attending the Cartan Seminar and other courses, he left little or no imprint on the people who surrounded him there. Sitting in the back of the room, freely asking questions that revealed his ignorance of the subjects under consideration, he was treated with courtesy, but the extraordinary level of his talent was neither observed nor recognized except by a single person, whose influence played an essential role in giving Grothendieck the opportunity to become a mathematician. André Magnier, general inspector of schools, professor in the prestigious classe préparatoire, and member of the board of the EUF (Entraide Universitaire Française), an association which provided and still continues to provide scholarships to needy foreign students. Thanks to Magnier's support and recognition of Grothendieck's remarkable talent, the doors of the French mathematical world were opened to him.

A penniless undergraduate: Mayrargues, 1945-1948

Je suis né le 28.3.1928 à Berlin (Allemagne). Entré en France en Mai 1939 (mes parents, gens de lettres, étant émigrés en 1933-34).

Mon père fut interné en Octobre 1939, au Vernet, ma mère et moi en Juin 1940, à Rieucros (Lozère) puis à Brens (Tarn). Grâce à l'intervention de la Cimade, je pus quitter le camp en Juin 1942.

Depuis Novembre 1945, je suis étudiant en Sciences à l'Université de Montpellier. En Juin 1946, j'ai obtenu le Certificat d'Études supérieures de Mathématiques Générales avec la mention "Très Bien". Actuellement, je prépare la Licence pour Juin-Octobre de cette année.

En Août 1942, mon père (israélite) a été déporté; il a disparu. Ma mère, libérée en 44, a passé une année à la Maison de Repos de la Cimade au Chambon. Depuis elle a pris sur elle de gagner notre vie, avec l'appui d'une mensualité (de 2500 frs actuellement) de la part du CIR. Mais maintenant elle se trouve dans un tel état d'épuisement physique qu'elle ne pourra pas de sitôt entreprendre quoi que ce soit.

J'espère, ma licence obtenue en Octobre, trouver un poste dans l'enseignement privé, ce qui me permettrait d'assumer la charge de notre petite famille et de continuer mes études.

Il y a donc, en tout cas, plusieurs mois difficiles à passer, ce qui ne nous serait pas possible sans une aide efficace, et je prie le CIR de m'accorder pour les mois à venir la

même allocation qu'à ma mère.

Peut-être est-il nécessaire de souligner que je ne reçois aucune bourse ni autre secours.

Montpellier le 6.3. 1947

A. Grothendieck¹

In early 1947, when he wrote this letter, Grothendieck was in his second year of the French undergraduate course leading to the degree known as Licence, or Certificat d'Études Supérieures. This course of study consisted in a first year of general mathematics (Certificat d'Études), which Grothendieck completed in June 1946 with the highest grade of "Très Bien", and a minimum of three other intensive year long "options", each consisting of several courses, in subjects for which the student had some degree of choice (though not much considering the level of teaching and the number of students in Montpellier at that time). Surprisingly, in 1946-1947, Grothendieck's diplomas from Montpellier showed that he studied Differential and Integral Calculus, Rational Mechanics, and Advanced Astronomy. He thought he would succeed in completing all three at the end of his second year at school, although the work was generally considered to require two years of study. But he wasn't expecting to have any difficulty with them, at least no mathematical difficulty. The financial situation was so dire, though, that he turned to the CIMADE with an urgent request for help.

The CIMADE is an organization which still exists today, whose purpose is to provide help to legal and illegal immigrants, refugees and displaced persons. Today the CIMADE bills itself as ecumenical, but at its creation in October 1939, the Comité Inter-Mouvements Auprès Des Evacués, the group was expressly destined to provide help and support of a religious nature to some two hundred thousand Protestant evacuees from Alsace and Lorraine, struggling to survive in exile in wartime France. It was created by an Alsatian theologian, Suzanne de Dietrich, whose travels to various regions of France brought her face to face with the difficulties endured by the refugees who not only had lost their homeland, but also found themselves facing social rejection, as Protestants isolated within intensely Catholic communities. She called upon an already-existing association, the CIM (Comité Inter-Mouvements) which worked with and coordinated a number of Protestant youth organizations of the YMCA type. Under the influence of Suzanne de Dietrich and the directors of the CIM, the group added three initials to its name, and undertook the specific task of relieving the plight of the displaced Alsatians: in their own words, "being present and helpful to the Protestant evacuees in the South-east, relieving their suffering from cold, boredom and material difficulties", and more generally "acting for the benefit of evacuees, and through the various organized groups of Protestant youth, to bring witness for the Gospel to the whole of French youth, severely tried by the war".

Originally, the CIMADE was conceived to bring the evacuees support of an essentially spiritual nature, with practical outlets such as craft groups or Sunday school and catechism classes for children. The organization possessed two cars and a quantity of religious objects such as altar cloths, crosses, Bibles and so forth, and they circulated extensively, visiting villages and hospitals. The active members were all women in the earliest days, since the men were at the front, and the women who worked for the CIMADE between October

1939 and May 1940 were all Protestant leaders: deaconesses, girl scout chiefs and heads of local Protestant groups. But this phase of the CIMADE's activity came to an end in June 1940 when, after the arrival of the German troops in Sedan, Marshal Pétain signed an armistice with Hitler, and the refugees from Alsace and Lorraine were allowed to return home.

Searching for a new terrain of action, the CIMADE now focused on the internment camps in the French free zone* created in France to hold the various "undesirables" who were not allowed by the Vichy government to roam free during wartime: at first principally Spanish republicans who had fought against Franco in the Spanish Civil War, but then also increasing numbers of refugees from the various European countries annexed by Hitler: gypsies, communists, German intellectuals opposed to Nazism, and foreign Jews. When Pétain began to promulgate laws imitating the Nazi laws modifying the status of Jews, the French Protestant community responded with multiple efforts to help and hide the victims. The CIMADE focused its activity on helping those interned in the camps, and opposing the antisemitic politics of the Vichy régime. "Save them any way you can" became their slogan of resistance to the order to collect Jews in transit camps such as the infamous Drancy, for subsequent deportation to Auschwitz. The CIMADE organized secret lines of flight to Switzerland, fabricated false identity cards, found host families to hide individual Jews, and even negotiated with the Vichy government the permission for certain women and children to leave the camps for CIMADE-run residences of which the most famous one was located near the village of Le Chambon-sur-Lignon, where Grothendieck was sent in June 1942, after two years of internment.

After the end of the war, the CIMADE continued to help refugees, survivors and recently freed prisoners. When Grothendieck's mother Hanka was finally released from the Rieucros camp in 1944, the CIMADE arranged for her to join Alexandre in Le Chambon, where she spent a year living in the CIMADE-run "Maison de Repos". After his graduation from high school**, they moved together to the small village of Mayrargues *** near Montpellier, where Hanka made an attempt to support herself and her son by working as a cleaning lady, supplemented with the tiny stipend she received from the CIR.

The CIR was something completely different from the CIMADE. With full name Le Comité Intergouvernemental pour les Réfugiés, the CIR was an international organization created in 1938 for the express purpose of seeking a solution to the problem of the tens of thousands of German and Austrian Jews fleeing Nazism and trying to enter other countries, especially the United States. The explicit goal of the committee was to find a place for these refugees, but they did not manage to find a single government willing to accept them, except for the Dominican Republic, which accepted the offer to take in 1000 refugees while being paid a sum of \$5000 per head by the Jewish community of New York. The CIR did not obtain any further success in relocating Jewish refugees, but in July of 1946, it was authorized by its executive committee to extend its program of operations to include emigration services on behalf of non-repatriable refugees in Germany, Austria and Italy.

* Gurs, Rieucros, Récébédou, Noé, les Milles, Rivesaltes, Brens, Septfonds, and Vernet

** He passed his Baccalaureate in 1945, receiving the grade "Mention Très Bien".

*** Grothendieck invariably spelled it "Mairargues" rather than "Mayrargues", even in letters written while he was actually living there.

The CIR worked on resettlement of refugees, extending its action to “all persons wherever they may be who, as a result of events in Europe, had to leave or may have to leave their countries of residence because of danger to their lives or liberties on account of race, religion or political beliefs.” Nansen refugees, German and Austrian refugees, Spanish refugees and displaced persons who were unable or unwilling to return to their countries of nationality were entitled to aid from the Committee. On her release from the internment camp at Rieucros, the CIMADE had helped Hanka Grothendieck apply to the CIR for a small stipend. With this money, together with the meager earnings from her work, Hanka attempted to support herself and her son Alexandre, or Schurik as he was familiarly called.

Unfortunately, though, the tuberculosis she had contracted during her imprisonment soon made it impossible for her to clean houses; she was quite ill, and even forced to spend considerable periods of time in bed. For some time during those years, Hanka’s elder daughter Maidi from her first marriage (Schurik’s half-sister) came from Hamburg, where she had spent the war, to live with her mother and brother in Mayrargues. Both she and Schurik occasionally earned some money participating in the region’s annual grape harvest. But Maidi found living with her mother and her brother very difficult. They were bound together in a symbiotic relationship from which she was excluded, and they expressed their feelings through the same kind of violent quarrel (complete with screaming, smashing of china and declarations of imminent departure) that had peppered Hanka’s life with Sascha even before their son was born, filling both members of the couple with a sense of emotional drama, and giving them the feeling that they were uncompromising in their demand for the absolute in love, in loyalty and in faithfulness to ideals. At any rate, the quarrels between Hanka and Schurik appear to have cast no shadow on their view of that time, which they both describe affectionately. But it was difficult for Maidi, and the problems were complicated when she fell pregnant from an unknown man. This caused terrific family explosion, and Maidi departed to Paris, leaving Hanka and Schurik behind to go on as they had begun.

Grothendieck evokes this period in a much-quoted passage from *Récoltes et Semailles*:

Entre 1945 et 1948, je vivais avec ma mère dans un petit hameau à une dizaine de kilomètres de Montpellier, Mairargues (par Vendargues), perdu au milieu des vignes[...]. On vivait chichement sur ma maigre bourse d’étudiant. Pour arriver à joindre les deux bouts, je faisais les vendanges chaque année, et après les vendanges, du vin de grappillage, que j’arrivais à écouler tant bien que mal (en contravention, paraît-il, de la législation en vigueur...) De plus il y avait un jardin qui, sans avoir à le travailler jamais, nous fournissait en abondance figues, épinards et même (vers la fin) des tomates, plantées par un voisin complaisant au beau milieu d’une mer de splendides pavots. C’était la belle vie – mais parfois juste aux alentours, quand il s’agissait de remplacer une monture de lunettes, ou une paire de souliers usés jusqu’à la corde. Heureusement que pour ma mère, affaiblie et malade à la suite de son long séjour dans les camps, on avait droit à l’assistance médicale gratuite. Jamais on ne serait arrivés à payer un médecin... (RS 33)²

Although Grothendieck appears to have taken the miserable conditions with the traditional family lightheartedness, his dossier from the CIR shows that the financial problems

were severe enough to force him to seek for help by his second year of university*. As his mother had done two years earlier, Grothendieck turned to the CIMADE for advice. They themselves did not provide financial support, but they recommended him in their turn to the CIR, in the hopes that he could obtain the same stipend as his mother, and thus double their income. So it happened that in mid-March 1947, just a few days before his 19th birthday, Grothendieck addressed the letter reproduced above to the French office of the CIR, located at 7 rue Copernic in the 16th arrondissement of Paris: a kind of application letter/curriculum vitae, describing his past and present circumstances, and depicting the family's financial emergency in poised but clear terms.

The CIR responded by providing him with official recognition of his stateless refugee status, attested by a certificate stamped with the number 11.588. Seeing that he was a student, however, they chose to help him seek a scholarship rather than grant him the standard stipend. Governor V. Valentin-Smith, the official delegate of the CIR in France, sent his file on to an organization known as the EUF (Entraide Universitaire Française), accompanied by a short letter dated March 24, 1947, stating that "Ce jeune homme m'est adressé par la CIMADE qui le connaît bien et me signale qu'il est un sujet très intéressant. Je vous remets le curriculum vitae de l'intéressé en vous demandant de voir s'il n'est pas possible de lui consentir une bourse d'études."³

University studies: Montpellier, 1945-1948

In preparing an application for a scholarship to the EUF, Grothendieck needed to explain not only his financial situation, but also his intended course of study, and the work he had done so far.

During these years of his undergraduate study, although he went to all the examinations, Grothendieck didn't go to class very regularly, and spent a great deal of time at home. In a letter from Hanka Grothendieck to Dagmar Heydorn* written during that time, she talks about their lives, her illness, and their difficult financial situation.

Das wäre alles ganz schön und gut, aber im Juni hat Schurik ein Examen abzulegen. Und durch meine Krankheit ist er seit 2 Monaten fast gänzlich aus der Arbeit heraus. Im April verblieb er bei uns, um mich zu pflegen und den Haushalt gut zu machen - damit wir uns das leisten konnten, mußte Schurik beim Bauern als Tagelöhner arbeiten. Leider nur 14 Tage lang, dann kam ein langer Streik in den Fabriken in der Stadt. Arbeitslosigkeit - und seit Ende April spielt Schurik nur die Hausfrau + Krankenpfleger.⁴

* It is to be noted that this passage, written in the 1980s, contradicts the letter quoted above from March 1947, in which Grothendieck asserted that he received no scholarship, and that he and his mother essentially lived on her monthly stipend. It is conceivable that he had a scholarship before or after the writing of that letter, or that he had one but chose not to mention it, or perhaps he never had one and his memory betrayed him a little, nearly four decades later.

* The woman who had raised Schurik in Germany from the age of 5 to the age of 11, when she sent him to Paris to join his parents.

Because of these periods of weeks together when Grothendieck could not go to class, he worked instead on his own personal mathematical research, the one he had begun just out of high school: attempting to give a satisfactory definition of the notions of length, area and volume. It seems that while engaged in this endeavor, he felt an absolute certitude of success which required no external confirmation or approbation at all. In *Récoltes et Semailles*, he describes his dissatisfaction with the notions presented in his textbooks and studied in class.

*Ce qui me satisfaisait le moins, dans nos livres de maths, c'était l'absence de toute définition sérieuse de la notion de longueur (d'une courbe), d'aire (d'une surface), de volume (d'un solide). Je me suis promis de combler cette lacune, dès que j'en aurais le loisir. J'y ai passé le plus clair de mon énergie entre 1945 et 1948, alors que j'étais étudiant à l'Université de Montpellier. Les cours à la Fac n'étaient pas faits pour me satisfaire[...] Aussi je ne mettais les pieds à la Fac que de loin en loin, pour me tenir au courant du sempiternel "programme". Les livres y suffisaient bien, au dit programme, mais il était bien clair aussi qu'ils ne répondaient nullement aux questions que je me posais. A vrai dire, ils ne les **voyaient** même pas[...] Du moment où ils donnaient des recettes de calcul à tout venant, pour des longueurs, des aires et des volumes, à coups d'intégrales simples, doubles, triples (les dimensions supérieures à trois restant prudemment éludées...), la question d'en donner une définition intrinsèque ne semblait pas se poser, pas plus pour mes professeurs que pour les auteurs des manuels.*

D'après l'expérience limitée qui était mienne alors, il pouvait bien sembler que j'étais le seul être au monde doué d'une curiosité pour les questions mathématiques. Telle était en tous cas ma conviction inexprimée, pendant ces années passées dans une solitude intellectuelle complète, et qui ne me pesait pas. A vrai dire, je crois que je n'ai jamais songé, pendant ce temps, à approfondir la question si oui ou non j'étais bien la seule personne au monde susceptible de s'intéresser à ce que je faisais. Mon énergie était suffisamment absorbée à tenir la gageure que je m'étais proposé: développer une théorie qui me satisfasse pleinement.

*Il n'y avait aucun doute en moi que je ne pourrais manquer d'y arriver, de trouver le fin mot des choses, pour peu seulement que je me donne la peine de les scruter, en mettant noir sur blanc ce qu'elles me disaient, au fur et à mesure. L'intuition du **volume**, disons, était irrécusable. Elle ne pouvait qu'être le reflet d'une **réalite**, évasive pour le moment, mais parfaitement fiable. C'est cette réalité qu'il s'agissait de saisir, tout simplement[...]*

En m'y mettant, à l'âge de dix-sept ans et frais émoulu du lycée, je croyais que ce serait l'affaire de quelques semaines. Je suis resté dessus pendant trois ans. (RS 33-34) ⁵

Contrary to prediction, and possibly because of his devotion to his own personal research, he did not quite manage to complete his degree as expected in June 1947. He obtained his diploma for Calculus (with the highest grade of "Très Bien") and the diploma for Mechanics (with the lowest grade of "Passable"), but he failed one of the exams in Astronomy, and thus found himself obliged to spend a third year in Montpellier. He enrolled once again in Advanced Astronomy for the academic year of 1947-48, but it goes without saying that he must have barely laid eyes on the inside of the mathematics building during that year, devoting all of his time and energy to his manuscript on a theory

of measure. This project absorbed him completely, in spite of the fact that he was told by his professors that his theory already existed, and that in any case, mathematics was a finished subject. Such information meant nothing to him, as he was well aware that his interlocutors, while well-intentioned, had not the slightest clue about what he was trying to do.

J'ai trouvé même moyen, à force, de loucher un examen, en fin de deuxième année de Fac – celui de trigonométrie sphérique (dans l'option "astronomie approfondie", sic), à cause d'une erreur idiote de calcul numérique. (Je n'ai jamais été bien fort en calcul, il faut dire, une fois sorti du lycée...) C'est pour ça que j'ai dû rester encore une troisième année à Montpellier pour y terminer ma licence, au lieu d'aller à Paris tout de suite – le seul endroit, m'assurait-on, où j'aurais l'occasion de rencontrer les gens au courant de ce qui était considéré comme important, en maths. Mon professeur, Monsieur Soula, m'assurait que les derniers problèmes qui s'étaient encore posés en maths avaient été résolus, il y avait vingt ou trente ans, par un dénommé Lebesgue. Il aurait développé justement (drôle de coïncidence, décidément!) une théorie de la mesure et de l'intégration, laquelle mettait un point final à la mathématique.

Monsieur Soula, mon prof de "calcul diff", était un homme bienveillant et bien disposé à mon égard. Je ne crois pas qu'il m'ait convaincu pour autant. Il devait déjà y avoir en moi la prescience que la mathématique est une chose illimitée en étendu et en profondeur. La mer a-t-elle un "point final"? Toujours est-il qu'à aucun moment je n'ai été effleuré par la pensée d'aller dénicher le livre de ce Lebesgue dont Monsieur Soula m'avait parlé, et qu'il n'a pas dû non plus jamais tenir entre les mains. Dans mon esprit, il n'y avait rien de commun entre ce que pouvait contenir un livre, et le travail que je faisais, à ma façon, pour satisfaire ma curiosité sur telles choses qui m'avaient intrigué. (RS 33-34) ⁶

Already at 19, Grothendieck was not a researcher who sought and hoped to find; already then, mathematics appeared to him like a domain in which one had only to look around to make quantities of interesting observations, and already he was seeking to find the deepest "natural" or "intrinsic" definitions of familiar notions: traits which characterized his approach to mathematics throughout his life.

Applying for a scholarship: autumn 1948

Having managed to pass the famous Astronomy exam in June 1948 (with the modest grade of "Passable"), Grothendieck addressed a formal application for a scholarship to the Entraide Universitaire Française, as Valentin-Smith of the CIR had suggested that he should a year and a half earlier. Grothendieck's file from the EUF archives, which are conserved in the French National Archive center in Fontainebleau, contains an official document from the CIR dated July 1948, attesting that Grothendieck had the status of a German refugee and that as such, according to the Geneva Convention, he was entitled to free medical assistance. Grothendieck was summoned to Paris for an interview, and received personally by the mathematics professor André Magnier, who devoted a significant amount of time to helping young refugees study at university in order to equip them with

skills that could help them pick up the shattered pieces of their lives.

Magnier listened to Grothendieck's discussion of his plans, and above all of his personal research, and spotted immediately that here was something out of the ordinary. He wrote the necessary letter of recommendation that had to accompany Grothendieck's formal application for a scholarship. This letter, dated October 19, 1948 (the fall semester in France at the time began in November), is short and to the point.

J'ai reçu aujourd'hui M. Grothendieck. Il m'a dit ses études et projets.

Après une licence préparée et passée à Montpellier en Juillet 1946 et Juillet 1947, il a fait, seul, quelques recherches en 1947-1948 sur des questions qui s'étaient posées à lui à propos de l'enseignement qu'il avait reçu. Ces questions étaient bien, en effet, essentielles pour compléter les connaissances qu'il avait et son choix dénote des aptitudes réelles pour la recherche.

Il voudrait maintenant préparer une thèse de mathématiques à Paris; je ne sais pas s'il pourra, comme il croit, la faire effectivement en 2 ans (le fait s'est déjà produit, mais il est exceptionnel); en tous cas il tirera certainement un excellent parti du séjour qu'il ferait ici et du travail qu'il pourrait fournir.

Il ne pourra, une fois docteur, enseigner en France (il pourrait néanmoins pendant quelque temps être pris en charge par le CNSR [sic]); mais s'il pourrait alors trouver assez facilement une chaire à l'étranger. Je souhaite toutefois, en vue de cette hypothèse, que, sans négliger ses recherches, il acquière en physique les connaissances qu'il n'a pu acquérir à Montpellier.

Il serait donc très souhaitable que l'Entraide Universitaire puisse l'aider à se consacrer uniquement à ses études.

A. Magnier⁶

One may notice a little discrepancy with the remark cited above from *Récoltes et Semailles*, which gives a slightly different reason for his remaining for a third year in Montpellier. The reader is invited to form a personal opinion as to whether Grothendieck's later memory was inexact, or whether he chose to elide the detail of his failed examination when discussing his projects with Magnier.

Later, Magnier would recall the circumstances of his first meeting with Grothendieck, in a little text published in the bulletin of the École Normale, expressing (and not merely with the benefit of hindsight) even more astonished enthusiasm than that reflected in the letter above.

A l'époque, en 1948, je faisais partie de l'Entraide Universitaire de France. Comme Grothendieck était dans une situation de dénuement total, nous lui avons proposé de présenter un projet d'études. Je le reçus chez moi. Je fus stupéfait. Au lieu d'un entretien de vingt minutes, il passa deux heures à m'expliquer comment il avait reconstruit, 'avec les moyens du bord', des théories qui avaient mis des siècles à se construire. Il montrait une sagacité extraordinaire. Je lui accordai immédiatement la bourse et le mis en contact avec Henri Cartan, qui l'admit à son cours de l'École Normale Supérieure. Grothendieck donnait l'impression d'un jeune homme extraordinaire mais déséquilibré par la souffrance et la privation.⁷

Certainly, Magnier's warm recommendation was sufficient to ensure that Grothendieck would be one of the lucky recipients of a scholarship, but to the satisfaction of the biographer, he was nonetheless required to fill out a standard application form.

The application form for a scholarship in 1948 (mimeographed on poor quality paper from an original typed on an old-fashioned machine) clearly indicates that the scholarships were not attributed in order to help the refugees settle in France, but at least to some extent in the hopes or in the expectation that, equipped with a proper education and a diploma, they would eventually settle abroad, either with the scholarship or after the completion of their studies. These applications consisted in two stages: first a letter of motivation accompanied by one or more letters of recommendation, which could then lead to an interview, and subsequently, if the interview was successful, a formal application for a scholarship starting immediately. The questions on the application form (reproduced for the most part below) illuminate the political climate of the time; Grothendieck's answers illustrate the mindset of an exceptionally determined young man in family circumstances typical enough of chaotic post-war France. The most surprising feature is his almost aggressively stated desire to leave France, and his lack of repugnance for the idea of settling in Germany. Although there is no detail, some of his answers give a strong impression of immaturity; the dislike of France was probably founded on the treatment that he and his family had received there – internment and deportation – nothing to be proud of, indeed. Yet the idea of returning to Germany if necessary – anything rather than France – was grotesque, and surely denoted a real ignorance of what had happened there during the years of the war. It is all the more ironic that the uncle Siegfried whom Grothendieck mentions in the form was (according to his daughter Cordula) a firm supporter of Hitler, who became a little disappointed only late in the war, when he perceived, as he put it, that Hitler was being led astray by the negative influence of certain people surrounding him.

QUESTIONNAIRE

Nationalité: *Apatride*

Nationalité d'origine: *Allemande*

Religion: *néant*

Charges de Famille: *Pas encore définies (dépendant du sort d'une demande d'allocation pour ma mère)*

Profession des parents: *Gens de lettres*

Avez-vous été interrompu dans vos études? *Intérieurement 22 mois; les 7 derniers mois, cause maladie mère*

Université ou Écoles Supérieures: *oui*

De quel pays? *France*

Combien de semestres? *6*

Quels examens avez-vous passés? *6: Math. Gén., Calcul, Méc. Rat. Astro.*

Dans quelle Université ou École êtes-vous actuellement? *Je vais m'inscrire ses [sic] jours-ci à la Sorbonne; avant, Univ. de Montpellier*

Quelle année, quel examen préparez-vous? *Aucun; recherches personnelles*

Dans combien de temps aurez-vous terminé vos études? *Je suis déjà licencié; pense faire mon Docteur*

Noms et adresses des professeurs pouvant donner renseignements à votre sujet: *Monsieur Soula, Monsieur Magnier*

Pour quelles raisons n'avez-vous pas continué vos études dans votre pays? a) Législation anti-sémite, b) raisons politiques, c) autres raisons? *b) et c), rejoint en 39 mes parents, émigrés en 33 et 34*

Avez-vous eu une occupation rémunérée durant vos études? *Incidemment (Ouvrier agricole journalier, vendanges)*

Quelles langues parlez-vous? *Allemand, français, passablement l'anglais*

Dans quel pays désirez-vous continuer vos études? *en France*

Dans le cas où vous envisageriez une émigration aux Etats-Unis êtes-vous inscrit auprès d'un Consulat Américain pour obtenir un visa d'émigration?

Dans quel pays espérez-vous pouvoir vous établir après avoir terminé vos études? *Abyssinie, en tous cas à l'étranger; s'il le faut, en Allemagne*

Disposez-vous à l'étranger, de relations qui pourraient faciliter votre émigration? Si oui, prière de donner des indications exactes. *En Allemagne, un conférencier bien connu à Hamburg, Pastor Heydorn, Babendickstrasse 1, Hamburg-Blankenese*

Avez-vous l'intention d'émigrer en Palestine? *Non*

Avez-vous la perspective de trouver un emploi dans votre profession après avoir terminé vos études? (Si oui, donnez des explications). *Après mon Docteur, professeur d'université*

Quelles autres occupations pourriez-vous envisager au cas où la continuation de vos études ne serait pas possible? *Professeur de collège privé; ne me permettrait pas la recherche scientifique*

Lequel des domaines suivants vous intéresserait-il si une réorientation professionnelle devenait nécessaire: a) Agriculture et horticulture, b) un métier, c) une occupation commerciale, d) en cas d'étudiant en médecine, soins aux malades, massages médicaux etc...

Aucun

Quel est votre état de santé? *Bon*

Disposez-vous de ressources financières? *Non*

Etes-vous indépendant ou avez-vous des personnes à votre charge? *Eventuellement ma mère, au cas où l'Ira ou Genève ne lui accorderait pas d'allocation*

Pourriez-vous couvrir une partie de vos frais d'études en travaillant (c'est-à-dire dans les pays où le travail est permis aux étrangers)? *Difficilement. Eventuellement, des leçons particulières, mais retarderait beaucoup mon travail (de toutes façons, il faudra que je gagne quelque argent pour aider ma mère, même si elle recevait l'allocation)*

Avez-vous des parents habitant le pays vers lequel vous désirez émigrer ou dans un autre pays étranger? *En Allemagne, un oncle Siegrid [sic] Grothendieck, Hamburg-fu (citoyen allemand)⁸*

Some of Grothendieck's responses are deserving of remark. It is striking, for example, that he apparently felt no connection of any kind to Judaism, not even that which might have been aroused in him from the fact of his father's having been deported from Vernet to perish in Auschwitz. It is possible that Grothendieck considered his father's internment as political: a consequence of his anarchist background and his activities in the Spanish Civil War rather than of his Judaism. This standpoint, from which the martyr could be perceived as a hero rather than a victim, fits well into the psychology of the family formed by Sascha, Hanka, Mairi and Schurik.

Even as he ostentatiously displayed the intention of settling virtually anywhere outside of France (with the almost insolent "Abyssinia"), the idea of emigrating to Palestine obviously left him indifferent. The blank response to the question about emigrating to the US may denote a pause for reflection; it is conceivable that the possibility had not occurred to him, but that once presented, it momentarily caught his attention; at any rate, he did not, as he might have, scotch the idea with a laconic *No*. The most surprising features of the questionnaire are his desire to leave France and his apparent willingness to return to Germany. The latter project must have lost validity in his mind with the passing of the years, perhaps as he learned more about the events of the Holocaust, but as it will appear later on, the desire to leave France never entirely disappeared, even when he appeared most firmly rooted there.

A final observation is the street name "Babendick", given as the address of Pastor Heydorn, with whom Grothendieck had lived from the age of 5 to 11. Anyone who has read the autobiography of Grothendieck's mother Hanka will immediately recognize one source of the fictional name she gave herself there: Charlotte Babendeerde, a combination of the street name "Babendick" (with the last syllable, too close to her true name "Grothendieck", removed), and the term "bebende Erde" which signifies "quaking earth" (Erdbeben=earthquake).

This questionnaire was accompanied by a small budget, which Grothendieck established to justify the amount of the scholarship he applied for. Apart from the rent of a room in a student's residence, he requested 2700 F monthly, calculated as the total cost of transportation, enrollment fees, books, paper, laundry, darning and last but not least, what he entered as "bread", rather than the expected "food" or "groceries".

The scholarship was awarded to Grothendieck on November 27, 1948, just after the start of the academic year, and his file was opened in that month, with the brief heading

testifying to André Magnier's prescience and understanding:

GROTHENDIECK Alexandre

Etudes Mathématiques en Sorbonne

Situation

Ressources nulles

Garant M. Magnier

Avenir sujet exceptionnel certain⁹

Grothendieck was sent to live in the CIMADE-run students' residence situated at 2 rue du Parc Cheviron in Sèvres, a suburb situated to the southwest of Paris. A rather impressive old manor situated in a large park, the Sèvres residence had been rearranged to receive 30 to 35 refugee students who were attempting to obtain a diploma and some professional competence before emigrating or returning to their country of origin. When Grothendieck arrived there, he found students from at least 12 different countries: a Spanish boy, wounded in the Spanish civil war, studying accounting; a Polish girl who had lost her family to deportation studying to be a secretary, a Bielorussian boy dreaming of contributing to his country's independence. The brief description of a German student at Sèvres, from a list of such short descriptions written a few years later, reads:

His father was tortured by the Gestapo. He lived in a concentration camp from age 8 to age 16. Since that time, he has done remarkably well in his studies. His professor at the Sorbonne oriented him towards research in higher mathematics, and he now has a very interesting position in the Scientific Research.*

The house was run by a strict Protestant pastor by the name of Paul Evdokimov. The pastor took his charges seriously: "The intention of the CIMADE was for this Center to be not just a house where people slept and ate, but a place where the Gospels were heard, and from which they would radiate. The students who were accepted there were chosen carefully, not only for their intellectual abilities, so that helping them with their studies would not be useless or even dangerous for their future, but also for their moral value and their spiritual preoccupations." The Christian students (Roman Catholic, Orthodox and Protestant) built a chapel in the grounds with their own hands, and Evdokimov wrote that "These young people, often very talented intellectually, are morally very poor, but they have a grand ideal. They are all political émigrés whose lives are dominated by the collapse of the spiritual values in their country. The first task is to provide them with a religious education, then an ecumenical one."

Alas, in March 1949, after barely five months spent living at the students' residence in Sèvres, Grothendieck was ejected. This may have been a consequence of his attitude towards religion; it is unlikely that he would allow himself to be forced into mandatory religious education or attendance at services. Also, it might possibly have been related to the problem of piano-playing. There was a piano in the students' common room, and late-night playing was something which was also to cause much grief to Grothendieck's landlords later on in Nancy. It could be that he wanted to play too much or too late, and resented being told to stop. In an enthusiastic letter to Dagmar Heydorn dated December

* Probably the CNRS.

15, 1948 (before any problems had arisen) and reproduced in its entirety below, he mentions both religion and the piano, saying in particular: “I have begun to study the piano again, and I hope through regular practice to soon make progress. It is a wonderful antidote to math, refreshing and stimulating.”

Whatever the problem was, a short note in the dossier by Magnier dated March 23, 1949 reads: ‘J’ai revu aujourd’hui M. Grothendieck – qui m’a dit être mis à la porte de Sèvres et ne pouvoir, à son regret et au mien, y retourner. Il convient donc de faire passer sa bourse à un taux plus élevé. Il en envoie d’ailleurs une partie importante à sa mère à Montpellier.’¹⁰

A new world: Paris, 1948-1949

Let us now turn to what Grothendieck was actually doing mathematically during the academic year 1948-1949, whilst his private life was spent, as we have seen, surviving on next to nothing and occasionally getting into trouble. He attended Leray’s course at the Collège de France, Cartan’s course at the École Normale, and the Cartan Seminar, which was running that year for the very first time. In those days, Henri Cartan played a role of unparalleled importance in French mathematics, holding court each week at the École Normale to an audience of brilliant youngsters. Into this hothouse milieu the young Grothendieck with the country bumpkin mathematical education and the poverty-stricken anarchist lifestyle was suddenly projected, leaving him with an impression described comically and yet touchingly in *Récoltes et Semailles*.

*J’ai découvert l’existence d’un monde mathématique en débarquant à Paris en 1948, à l’âge de 20 ans, avec dans ma maigre valise une Licence ès Sciences de l’Université de Montpellier, et un manuscrit aux lignes serrées, écrit recto-verso, sans marge (le papier était cher!), représentant trois ans de réflexions solitaires sur ce qui (je l’ai appris après) était alors bien connu sous le nom de “théorie de la mesure” ou de “l’intégrale de Lebesgue”. Faute d’en avoir jamais rencontré d’autre, je croyais bien, jusqu’au jour où je suis arrivé dans la capitale, que j’étais seul au monde à “faire des maths”, le seul **mathématicien** donc. (C’était pour moi la même chose, et l’est un peu resté jusqu’à aujourd’hui encore.) J’avais jonglé avec les ensembles que j’appelais mesurables (sans avoir rencontré d’ailleurs d’ensemble qui ne le soit...) et avec la convergence presque partout, mais ignorais ce qu’est un espace topologique. Je restais un peu paumé dans une douzaine de notions équivalentes “d’espace abstrait” et de compacité, péchés dans un petit fascicule (d’un dénommé Appert je crois, dans les *Actualités Scientifiques et Industrielles*), sur lequel j’étais tombé Dieu sait comment. Je n’avais pas entendu prononcer encore, dans un contexte mathématique du moins, des mots étranges ou barbares comme groupe, corps, anneau, module, complexe, homologie (et j’en passe!), qui soudain, déferlaient sur moi tous en même temps. Le choc fut rude!*

Si j’ai “survécu” à ce choc, et ai continué à faire des maths et à en faire même mon métier, c’est qu’en ces temps reculés, le monde mathématique ne ressemblait guère encore à ce qu’il est devenu depuis. Il est possible aussi que j’avais eu la chance d’atterrir

dans un coin plus accueillant qu'un autre de ce monde insoupçonné. J'avais une vague recommandation d'un de mes professeurs à la Faculté de Montpellier, Monsieur Soula (pas plus que ses collègues il ne m'avait vu souvent à ses cours!), qui avait été un élève de Cartan (père ou fils, je ne saurais plus trop dire). Comme Élie Cartan était alors déjà "hors jeu", son fils Henri Cartan fut le premier "congénère" que j'aie eu l'heur de rencontrer. Je ne me doutais pas alors à quel point c'était d'heureux augure! Je fus accueilli par lui avec cette courtoisie empreinte de bienveillance qui le distingue, bien connue des générations de normaliens qui ont eu cette chance de faire leurs toutes premières armes avec lui. Il ne devait pas se rendre compte d'ailleurs de toute l'étendue de mon ignorance, à en juger par les conseils qu'il m'a donnés alors pour orienter mes études. Quoiqu'il en soit, sa bienveillance visiblement s'adressait à la personne, non au bagage ou aux dons éventuels, ni (plus tard) à une réputation ou à une notoriété...

Dans l'année qui a suivi, j'ai été l'hôte d'un cours de Cartan à "l'École" (sur le formalisme différentiel sur les variétés), auquel je m'accrochais ferme; celui aussi du "Séminaire Cartan", en témoin ébahi des discussions entre lui et Serre, à grands coups de "Suites Spectrales" (brr!) et de dessins (appelés "diagrammes") pleins de flèches recouvrant tout le tableau. C'était l'époque héroïque de la théorie des "faisceaux", "carapaces" et de tout un arsenal dont le sens m'échappait totalement, alors que je me contraignais pourtant tant bien que mal à ingurgiter définitions et énoncés et à vérifier les démonstrations. Au Séminaire Cartan il y avait aussi des apparitions périodiques de Chevalley, de Weil, et les jours des Séminaires Bourbaki (réunissant une petite vingtaine ou trentaine à tout casser, de participants et auditeurs), on y voyait débarquer, tel un groupe de copains un peu bruyants, les autres membres de ce fameux gang Bourbaki: Dieudonné, Schwartz, Godement, Delsarte. Ils se tutoyaient tous, parlaient un même langage qui m'échappait à peu près totalement, fumaient beaucoup et riaient volontiers, il ne manquait que les caisses de bière pour compléter l'ambiance – c'était remplacé par la craie et l'éponge. Une ambiance toute autre qu'aux cours de Leray au Collège de France (sur la théorie de Schauder du degré topologique dans les espaces de dimension infinie, pauvre de moi!), que j'allais écouter sur les conseils de Cartan. J'avais été voir Monsieur Leray au Collège de France pour lui demander (si je me rappelle bien) de quoi traiterait son cours. Je ne me rappelle ni des explications qu'il a pu me donner, ni si j'y ai compris quoi que ce soit – seulement, que là aussi je sentais un accueil bienveillant, s'adressant au premier étranger venu. C'est cela et rien d'autre, sûrement, qui a fait que je suis allé à ce cours et m'y suis accroché bravement, comme au Séminaire Cartan, alors que le sens de ce que Leray y exposait m'échappait alors presque totalement.¹¹

The year 1948-1949 was the very first year of the Cartan Seminar, which reached legendary fame over the course of its sixteen-year run. The subject of that first year was Topology, and one can well imagine that Grothendieck might have felt out of place hearing a series of lectures, some given by Cartan and others by youngsters hardly older than himself (Serre, Cerf, Samuel, Dixmier) on topics covering the theory of simplicial complexes and their homology and cohomology. Yet it is tempting to imagine that he must have understood more than what he admits to in the passage quoted above. For one thing, the lectures were few and far between; only a dozen or so, taking place quite irregularly, once every week or two, from November to March, so that there was plenty of

time in between lectures to study their contents. For another, the lectures were entirely self-contained, as Cartan built up his theory, or guided the more advanced students to build up parts of it. The lecture notes are quite short, on the order of 6-10 pages for each lecture, and fairly complete, although certain notions that must have been presented carefully in the lecture are recalled in just a few words. But above all, the entire style of the seminar must have been greatly to Grothendieck's taste, after the calculation-oriented courses to which he had been subjected in Montpellier. Although one can quite imagine that he must have been occasionally lost trying to follow diagram chases of newly digested cohomology groups, one can equally well guess that he must have rejoiced inwardly when, at the very first lecture on November 11, Cartan began by introducing simplices in real space via weighted barycenters, a classical definition that he must have learned in detail in the "sempiternal syllabi" at Montpellier, and followed it up at once with the definition of an abstract simplicial complex, which captures the essence of simplices without any recourse to Euclidean geometry. From the point of view of a modern undergraduate, the definitions and notions that Cartan introduced (chains and cochains, homology and cohomology of a simplicial complex, duality, and so forth, with abelian groups, free groups etc. as examples) are not particularly difficult, much less so for a mind like Grothendieck's, naturally attuned to the most abstract language. Yet at the same time an innocent sentence like "Abelian groups will always be written additively and considered as modules over the ring of integers" (the first sentence of lecture 3) might well come as a shock to a student who, however motivated, had never heard any of the individual main words before. One can quite understand that while Grothendieck must have learned a great quantity of mathematics during that first year, the unfamiliarity of it compared to the circle of ideas on which he had already reflected deeply, must have prevented his interest from really catching fire. It is certain that throughout his life he betrayed not the slightest interest in any domain that was not his immediate concern at the moment – even his own work in functional analysis was shunted aside once he embarked on algebraic geometry, and Pierre Saphar, who was a young student in Orsay during the late 1960's, recalls some completely unsuccessful attempts to discuss his "old" mathematics with a Grothendieck now entirely devoted to SGA.

At any rate, Grothendieck's supposed ignorance and lack of understanding did not keep him silent during the lectures. At least one student, Jean Cerf, later a renowned topologist, recalls his presence in Cartan's lecture course on manifolds: "I saw [Cartan] again...in Paris at the École Normale (rue d'Ulm), when he was the professor and I a student in the course for second year students, in which he taught us what a differentiable manifold was, and where, from the back of the lecture room, an unknown person (it was Alexander Grothendieck) ventured to dialog with him as an equal..."¹²

And indeed, it does not seem that Grothendieck was unhappy during that year, in spite of the loneliness and all the difficulties he encountered on every level. According to his memories, the milk of human kindness was the only nourishment he needed (if even that); it was enough to stimulate his energy and his motivation, and the kindness he received in that year left him with a lasting – and rare – feeling of gratefulness.

La chose étrange, c'est que dans ce monde où j'étais nouveau venu et dont je ne comprenais guère le langage et le parlais encore moins, je ne me sentais pas un étranger.

Alors que je n'avais guère l'occasion de parler (et pour cause!) avec un de ces joyeux lurons comme Weil ou Dieudonné, ou avec un de ces Messieurs aux allures plus distinguées comme Cartan, Leray, ou Chevalley, je me sentais pourtant accepté, je dirais presque: un des leurs. Je ne me rappelle pas une seule occasion où j'aie été traité avec condescendance par un de ces hommes, ni d'occasion où ma soif de connaître, et plus tard, à nouveau, ma joie de découvrir, se soit trouvé rejetée par une suffisance ou par un dédain. S'il n'en avait été ainsi, je ne serais pas "devenu mathématicien" comme on dit - j'aurais choisi un autre métier, où je pouvais donner ma mesure sans avoir à affronter le mépris...

Alors qu' "objectivement" j'étais étranger à ce monde, tout comme j'étais un étranger en France, un lien pourtant m'unissait à ces hommes d'un autre milieu, d'une autre culture, d'un autre destin: une passion commune. Je doute qu'en cette année cruciale où je découvrais le monde des mathématiciens, un d'eux, pas même Cartan dont j'étais un peu élève mais qui en avait beaucoup d'autres (et des moins largués!), percevait en moi cette même passion qui les habitait. Pour eux, je devais être un parmi une masse d'auditeurs de cours et de séminaires, prenant des notes et visiblement pas bien dans le coup. Si peut-être je me distinguais en quelque façon des autres auditeurs, c'est que je n'avais pas peur de poser des questions, qui le plus souvent devaient dénoter surtout mon ignorance phénoménale aussi bien du langage que des choses mathématiques. Les réponses pouvaient être brèves, voire étonnées, jamais l'hurluberlu ébahi que j'étais alors ne s'est heurté à une rebuffade, à une "remise à ma place", ni dans le milieu sans façons du groupe Bourbaki, ni dans le cadre plus austère du cours Leray au Collège de France. En ces années, depuis que j'avais débarqué à Paris avec une lettre pour Élie Cartan dans ma poche, jamais je n'ai eu l'impression de me trouver en face d'un clan, d'un monde fermé, voire hostile. Si j'ai connu, bien connu cette contraction intérieure en face du mépris, ce n'est pas dans ce monde-là; pas en ce temps-là, tout au moins. Le respect de la personne faisait partie de l'air que j'y respirais. Il n'y avait pas à mériter le respect, faire ses preuves avant d'être accepté, et traité avec quelque aménité. Chose étrange peut-être, il suffisait d'être une personne, d'avoir visage humain. (RS 140)¹³

Grothendieck continued to think about the problems he posed to himself during that year. Roger Godement tells a story about how he brought a new theorem to Cartan in the middle of the year, concerning certain fields having a set of special properties. Cartan asked Grothendieck if he knew of any fields having the said properties. Grothendieck suggested the field of complex numbers. Cartan asked him if he knew of any others. A silence ensued...as it dawned on Grothendieck that no other field than the complex numbers could satisfy his properties.

But Grothendieck was irrepressible, and this discovery did not have any greater effect on him than the previous mishap, when Magnier explained to him that his work on measure and integration was already known. In a letter, written to his German foster mother Dagmar Heydorn in December 1948, he reveals that he had originally entertained the idea of defending a doctoral thesis on the basis of those results, but was now aware that this was impossible. He also gives a radiant picture of his joy at finally finding himself in a world of real mathematicians, where apart from learning a plethora of new things, he can work in peace, play the piano, meet new friends and even – oh miracle – get enough to eat.

Sèvres 15.12.1948

Liebe Tante Dagmar

Da ich weiß, daß Du das Weihnachtsfest anerkennst, möchte ich Dir noch zur rechten Zeit meine Weihnachtsgrüße senden. - Hanka und ich werden zu dieser Weihnacht nicht beisammen sein, und da wir nur ohnehin nichts schenken können, und wir ja keine eigentlichen Christen sind und Weihnachten bisher vor allem deshalb feierten, weil es ein so schönes Fest ist, daß es schade wäre, es nicht zu adoptieren - wird es uns wohl ziemlich unbemerkt vorbeigehen. Hanka schreibt intensiv an ihren Roman, sie fängt an, wieder zu ihren früheren Arbeitskraft zu gelangen. Zu Ende 1949 wird das Buch vielleicht schon erscheinen. Ich bin ob dieser Wiedergeburt froher, als über meine eigene Arbeit, die mir auch viel Freud macht. Meinen Doktor werde ich allerdings dies Jahr wohl nicht machen können, auf jeden Fall keinen sehr ernsthaften: meine paar persönliche Forschungen, als ich in Montpellier war, und die bei der mangelnden Dokumentation dort originell scheinen konnten, und die dann nicht ohne Wichtigkeit gewesen wären, haben sich hier als schon bekannt erwiesen. Und obendrein stellt er sich heraus, daß sogar in der neuen Mathematik meine Kenntnissen noch so lückenhaft sind, daß es wirklich angebracht ist, dies Jahr noch meine allgemeine mathematische Bildung zu vervollkommen. Unter ganz anderen Bedingungen allerdings als in dem stagnierenden Montpellier! Hier habe ich ausgezeichnete Lehrer, mit denen ich mich endlich verwandt fühlen kann. - Ich studiere algebraische Topologie, allgemeine Algebra, Anwendung der Topologie auf funktionale Gleichungen, Theorie des Maßes und der Integration (falls Dir das etwas sagt). Vor allem, sagte mir mein Lehrer, Henri Cartan, sei die algebraische Topologie ein Gebiet, das sehr viele Forschungen noch fordere.

Ich lebe hier unter ganz günstigen Bedingungen. Hinreichendes Essen, relative Ruhe zum Arbeiten, einige ganz gute Kameraden und sogar Kamaraderinnen. Zwar ist das "Quartier Latin" ziemlich weit, aber ich brauche nur dreimal pro Woche Vorlesungen beiwohnen. Was mir von Wichtigkeit ist: ich habe wieder angefangen, Klavier zu lernen, und hoffe durch regelmäßige Arbeit bald Fortschritte zu machen. Das ist eine außerordentlichen Antidote gegen Mathematik, erfrischend und stimulierend.

Hoffentlich bekomme ich auch Nachricht von Euch. Seit mehreren Monate habe ich nichts mehr von Euch gehört. Ich hoffe, daß euch keinerlei Unglück getroffen hat, oder daß ich Onkel Wilhelm nicht irgendwie unwillentlich gekränkt habe. Etwa durch meinen letzten Brief, da wohl ziemlich gekliert [sic] war oder seinen Inhalt; ich bin ja so schlecht erzogen!

Auch wurmt es mich, daß es uns nicht möglich ist, euch irgend etwas Hübschen zu schicken. Es ist peinlich, es immer bei ein paar Briefen bewenden zu lassen. Aber jede Kleinigkeit, und auch das Porto, sind derart teuer, und sowieso kommen wir auch nur so eben-und-eben durch -!

Grüße herzlich Onkel Wilhelm von mir; ich bitte ihn, mir etwas Ungezogenheiten zu verzeihen. Und Volker grüße auch. Und verbringe recht fröhlichen Festtage.

Dein Schurik

Perceiving Grothendieck's enthusiasm, and his devotion to the subject of functional

analysis, Cartan suggested as the springtime rolled around that Grothendieck write to Dieudonné, proposing to study with him, and mentioning a piece of work he had done lately on “generalized integrals”. Dieudonné responded with words of welcome and appreciation that confirmed Grothendieck’s feelings about the kindness shown to strangers within the mathematical milieu, and accepted to take him on as a graduate student at the University of Nancy starting in the autumn: “J’ai lu avec intérêt votre lettre du 30 juin; elle témoigne d’une ardeur pour les mathématiques modernes dont je ne peux que vous féliciter; et si vous venez à Nancy l’année scolaire prochaine, mes collègues et moi-même seront certainement heureux de vous guider dans vos recherches dans toute la mesure du possible...”¹⁴

And thus Grothendieck’s first year of graduate studies came to an end. He describes the year in his final report to the EUF with a nonchalant and optimistic “Etudes diverses en Mathématiques, pas d’examen en vue. (Je suis licencié, et poursuis des études en vue de travaux de recherche ultérieures. Compte entrer au CNRS en 1950.)”¹⁵ A handwritten note at the top of this form adds that Grothendieck requests financial help over the summer and is returning to his home to participate in the wine-making. The EUF continued to grant full support; in a small letter sent to him in Mayrargues, typed on the back of a scrap of torn newspaper that happened to have nothing on the other side (attesting to the scarcity of paper, the general poverty, and the necessity of adopting practical solutions in any possible way that characterized the postwar years in France), the accountant of the EUF let him know that he was mailing him a money-order for his scholarship covering the months of August and September. And in September 1949, Magnier wrote a brief appraisal of Grothendieck’s progress: “M. Grothendieck a très sérieusement travaillé cette année l’algèbre et la topologie moderne qu’il ne connaissait pas. Il doit, à partir d’Octobre, travailler à Nancy sous la direction de M. Dieudonné. Il est extrêmement souhaitable que sa bourse lui soit renouvelé pour l’année scolaire et, en outre, pour le mois de septembre 1949.”¹⁶

A short note added to the dossier in November 1949, however, states that Grothendieck has written to announce that, having received a stipend from Geneva, he renounced all further support from the EUF. This event marked the end of his contact with André Magnier, the man whose perspicacity was the springboard which allowed Grothendieck to leap into the world of French mathematics.

Translation of the French quotations

¹ I was born on 3/28/1928 in Berlin. I entered France in May 1939 (my parents, writers, had already emigrated in 1933-34).

My father was interned in October 1939, at Vernet, my mother and I in June 1940 at Rieucros (Lozère) and then Brens (Tarn). Thanks to the intervention of the Cimade, I was able to leave the camp in June 1942.

Since November 1945, I have been a student in science at the University of Montpellier. In June 1946, I obtained the Certificate of Higher Studies in General Mathematics [1st year university diploma] with High Honors. I am presently preparing the Licence [B.A.] for June or October of this year.

In August 1942, my father (a Jew) was deported: he disappeared. My mother, liberated in 44, spent one year in the Rest Home in Le Chambon. Since then, she has undertaken to earn our living, with the help of the monthly stipend (of 2500 francs) provided by the CIR. But she is now in a state of physical exhaustion so severe that she will not be able to undertake any work for some time.

Once I have obtained my *licence* in October, I hope to find a job in private teaching, which would enable me to take charge of our little family and to continue my studies.

In any case, there are several difficult months to get through, and this will not be possible without an efficient source of aid, and I request the CIR to give me, for the coming months, the same stipend as my mother. Perhaps I should emphasize that I do not presently receive any scholarship or other source of financial aid.

Montpellier, 3/6/1947. A. Grothendieck

² Between 1945 and 1948 I lived with my mother in a little village lost among the vineyards about ten kilometers from Montpellier, Mayrargues (near Vendargues). (My father had perished in Auschwitz in 1942.) We lived frugally on my meager scholarship. In order to make ends meet I worked during the grape harvest every year, and afterwards there was wine made from the late harvest which I was able to sell one way or another (apparently in defiance of current legislation). There was also a garden which, without ever having to put in any work, provided us abundantly with figs, spinach and even (towards the end) with tomatoes planted by an obliging neighbor amidst a sea of splendid poppies. It was a good life – but sometimes a little pinched, if it became necessary to replace eyeglasses or a pair of utterly worn out shoes. Fortunately for my mother, who was weakened and sick as a consequence of her long stay in the camps, we had the right to free medical treatment. We would never have been able to pay a doctor.

³ This young man has been sent to me by the CIMADE, who knows him well and tells me that he is a very interesting case. I send you his curriculum vitae, requesting you to see if it wouldn't be possible to grant him a scholarship.

⁴ That would all be nice and just fine, but in June Schurik has to pass an exam. And because of my illness, he hasn't been able to work on it for almost two months. In April he stayed at home to take care of me and of the house; for us to be able to do that, he

had to go work for the farmer as a day-worker. Unfortunately that only lasted for 14 days, then there was a long strike in the factory in the city. Unemployment - and since the end of April, Schurik has just played [the role of] housewife and nurse.

⁵ What satisfied me the least, in our math books, was the absence of any serious definition of the notion of length (of a curve), area (of a surface), or volume (of a solid). I promised myself to plug this hole as soon as I would have the time. I spent most of my energy on this between 1945 and 1948, while I was a student at the University of Montpellier. The courses at the university were not the type to satisfy me[...]So I set foot there only rarely, just to keep abreast of the sempiternal “syllabus” The books were quite sufficient, for the said syllabus, but it was also clear that they did not hold the answers to the questions I asked myself. In fact, they did not even *see* them[...] Once they had given a set of computational recipes for lengths, areas and volumes, using simple, double or triple integrals (dimensions higher than three being prudently ignored...), the question of actually giving an intrinsic definition did not seem to be asked, either for my professors or for the authors of the manuals.

According to the limited experience that I had at the time, it really seemed that I was the only person in the world actually blessed with a curiosity for mathematical questions. Such, at least, was my unexpressed conviction, during those years which I spent in a total intellectual solitude which did not weigh upon me. As a matter of fact, I believe that I never, in those days, thought of exploring the question of whether I was or was not the only person in the world who might be interested in what I was doing. My energy was sufficiently absorbed in winning the bet I had made with myself: to develop a theory which satisfied me completely.

There was never any doubt for me that I would succeed, that I would discover the final word, as long as I took the trouble to examine things closely and to note down black on white what they said to me, as I went along. The intuition of *volume*, for example, was undeniable. It could only be the reflection of a *reality* which remained elusive for the moment, but was perfectly reliable. It was that reality which I wanted to seize, quite simply[...]

When I started, at the age of 17 and just out of high school, I thought it would take me a few weeks. I worked on it for three years.

⁶ I even managed to fail an exam at the end of my second year of university – the exam in “spherical trigonometry” (in the option “astronomy in depth”, sic), because of a stupid computational error. (I was never very good at computations, I have to say, after I got out of high school...) That was the reason for which I had to remain for a third year in Montpellier, to finish my *Licence*, instead of going to Paris right away – the only place, I was told, where I would be able to meet people who knew what was important in math. My professor, Monsieur Soula, assured me that the last problems which had been asked in mathematics had been solved, twenty or thirty years earlier, by a certain Lebesgue. He had of all things (by a funny coincidence) developed a theory of measure and integration, which put a final point on mathematics.

Monsieur Soula, my professor of “differential calc”, was a benevolent man and was

quite kind to me. I don't think that he convinced me, though. I must already have had the feeling that mathematics are infinite, in breadth and in depth. Does the sea have a "final point"? At any rate, I did not for a single moment entertain the idea of going to find the book by that Lebesgue that Monsieur Soula told me about, and which he probably never had in his hands either. In my mind, there was nothing in common between what a book might contain, and the work that *I* was doing, in my own way, to satisfy my curiosity about certain things that had intrigued me.

⁶ I received Mr. Grothendieck today. He told me about his studies and his projects.

After a licence prepared and passed in Montpellier in July 1946 and July 1947, he spent the year 1947-48 alone, pursuing research on some questions which he had asked himself on the subject of some of the teaching he had received. These questions were quite essential for him to complete the knowledge he had already acquired, and his choice denotes a real aptitude for mathematics.

He would now like to do a thesis in mathematics in Paris: I do not know if, as he believes, he can finish it in two years (such a thing has already happened, but it is quite exceptional); in any case he will certainly gain much from a stay here and from the work he will be able to do.

Once he has received a doctorate, he will not be able to teach in France (although he can be supported for some time by the CNRS); but he should be able to easily find a chair abroad. In view of this hypothesis, I would hope that without neglecting his research, he would acquire the knowledge of physics that he was not able to learn in Montpellier.

It would be very desirable for the Entraide Universitaire to help him to devote himself entirely to his studies.

A. Magnier

⁷ At that time, in 1948, I worked at the Entraide Universitaire Française. As Grothendieck was utterly destitute, we proposed that he present us with a study project. I received him at my home. I was stupefied. Instead of a twenty-minute interview, he spent two hours explaining to me how he had reconstructed, using only 'the tools at hand', theories which it had taken centuries to construct. He displayed an extraordinary sagacity. I immediately gave him the scholarship and put him in contact with Henri Cartan, who admitted him to his course at the École Normale Supérieure. Grothendieck gave the impression of an extraordinary young man whom deprivation and suffering had rendered unstable.

⁸ QUESTIONNAIRE

Nationality: *Stateless*

Religion: *None*

Dependents: *Not yet clear (it depends on the result of an application for a stipend by my mother)*

Parents' profession: *Writers*

Were your studies interrupted? *22 months internment, and for the last 7 months because*

of my mother's illness

University or higher education? *Yes*

In which country? *France*

How many semesters? *6*

Which examinations did you pass? *6: General Math., Calculus, Rational Mechanics, Astro.*

In which university or school are you now? *I am going to enroll shortly at the Sorbonne; before that, Univ. of Montpellier*

Which year, which examination are you preparing? *None; personal research*

In how much time will you be finished? *I already have a B.A., I want to do a doctorate*

Names and addresses of professors who can give information about you: *Monsieur Soula, Monsieur Magnier*

Why did you not continue your studies in your own country? 1) Anti-semitic legislation, b) political reasons, c) other reasons? *b) and c), I joined my parents in 39, they had emigrated in 33 and 34*

Have you had a job during your studies? *Occasionally (daily farm worker, grape harvest)*

What languages do you speak? *German, French, reasonable English*

In which country do you wish to continue your studies? *France*

If you are considering emigrating to the United States, are you enrolled at an American Consulate to obtain an emigration visa?

In which country do you wish to settle after finishing your studies? *Abyssinia, or at any rate abroad; Germany if necessary*

Do you have friends or relatives abroad who could help with your emigration? If yes, please give exact details. *In Germany, a well-known lecturer in Hamburg, Pastor Heydorn, Babendickstrasse 1, Hamburg-Blankenese*

Do you have the intention of emigrating to Palestine? *No*

Do you have the possibility of finding a job in your profession after finishing your studies? If yes, explain. *After my doctorate, university professor*

What other occupation would you consider if it is impossible to continue your studies? *Teacher in a private school: this would prevent me from doing scientific research*

Which of the following domains would interest you if a professional reorientation became necessary: a) agriculture and horticulture, b) manual work, c) commercial work, d) for medical students, care for the ill, medical massage etc. *None*

What is your state of health? *Good*

Do you have any financial resources? *No*

Are you independent or do you have dependents? *Possibly my mother, if the IRA or Geneva does not grant her a stipend*

Could you cover part of the cost of your studies by working (in countries where foreigners are permitted to work)? *It would be difficult. I could give private lessons, but it would significantly delay my work (in any case, I will have to earn some money to help my mother even if she receives the stipend)*

Do you have relations living in the country where you desire to emigrate, or in another foreign country? *In Germany an uncle, Siegrid [sic] Grothendieck, Hamburg-fu (German citizen)*

⁹ GROTHENDIECK Alexandre

Studies: Mathematics at the Sorbonne

Situation: No funding, guarantor M. Magnier, subject definitely has exceptional future

¹⁰ I saw Mr. Grothendieck again today, and he tells me that he has been ejected from Sèvres and that to his and my regret, he will not be able to return there. He will thus need a larger scholarship. In any case he sends a large portion of it to his mother in Montpellier.

¹¹ I discovered the existence of a mathematical world when I got to Paris in 1948, at the age of 20, with not much more in my thin suitcase than a bachelor's degree in science and a closely-written manuscript using both sides of the paper and without margins (paper was expensive!), representing three years of solitary reflections on what (I later learned) was known as "measure theory" or "the Lebesgue integral". Since I had never met another, I believed until the day I arrived in the capital, that I was the only person in the world to "do mathematics", the only **mathematician**. (It was the same thing to me, and pretty much still is.) I had juggled with sets that I called "measurable" (without having ever seen one that was not...) and with convergence nearly everywhere, but I didn't know what a topological space was. I was a bit lost amongst a dozen equivalent notions of "abstract space" and compactness which I fished out of a little textbook (by someone called Appert, I believe, published in the *Scientific and Industrial News*), which I had come across God knows how. I still had never heard the strange and barbarous words group, field, ring, module, complex, homology (etc.) pronounced in a mathematical context, and suddenly, they were all rolling over me together. It was quite a shock!

If I survived that shock, and continued to do mathematics and even to do them professionally, it was because in those long-ago days, the mathematical world was not at all like what it became since. It is also possible that I had the luck of landing in a more welcoming corner than most, in that unsuspected world. I had a vague recommendation from one of my professors at the University of Montpellier, Monsieur Soula (who hadn't seen me at his lectures any more than his colleagues!), who had been a student of Cartan (father or son, I can't remember). As Élie Cartan was out of the running at that time, his son Henri Cartan was the first "colleague" that I had the pleasure of encountering. I had no idea at that time how fortunate that was! He welcomed me with that benevolent

courtesy that was typical of him, familiar to the generations of *École Normale* students who had the good fortune to cut their teeth with him. He probably didn't even realize the extent of my ignorance, to judge by the advice he gave me about orienting my studies. In any case, his benevolence was obviously directed towards my person, not towards my knowledge or possible gifts, nor (later) towards reputation or fame.

During the year that followed, I was the guest of Cartan at the *École* (on the differential formalism on manifolds), which I followed doggedly, and also at the Cartan Seminar, where I was a stunned witness to the discussions between him and Serre, throwing "spectral sequences" at each other (brr!) and covering the blackboard with drawings (called "diagrams") full of arrows everywhere. This was the heroic period of "sheaf" theory, "carapaces" and a whole arsenal whose meaning entirely escaped me, although I forced myself as well as I could to ingurgitate definitions and statements and check the proofs. Chevalley and Weil appeared every now and then at the Cartan Seminar, and on the days of the Bourbaki Seminar (to which at most 20 or 30 people came, speakers and audience together), the rest of the Bourbaki gang would arrive together, like a noisy group of friends: Dieudonné, Schwartz, Godement, Delsarte. They all used the familiar with each other, talked a language of which I understood next to nothing, smoked and laughed a lot; only a case of beer was missing to complete the atmosphere – that was replaced by chalk and sponge. There was a totally different atmosphere to Leray's course at the Collège de France (on Schauder's theory of topological degree in infinite-dimensional spaces, poor me!), which I attended on the advice of Cartan. I had gone to see Mr. Leray at the Collège de France to ask him (if I remember rightly) what his course would be about. I don't remember the explanations he gave me nor whether I understood anything about them—only that there, also, I felt a benevolent welcome that extended to any stranger who happened to come along. It was that and nothing else, surely, that made me go to the course and struggle along bravely, as I did in the Cartan Seminar, even though the meaning of what Leray was talking about escaped me just about completely.

¹² Jean Cerf, *Trois-quarts de siècle avec Henri Cartan*, *Gazette des Mathématiciens* **100**, April 2004.

¹³ The strange thing was that in that world, where I was a newcomer who hardly understood the language, let alone spoke it, I did not feel like a foreigner. Even though I hardly had any occasion (and for good reason!) to speak with the cheery members of the Bourbaki gang like Weil or Dieudonné, or with those more distinguished gentlemen like Cartan, Leray and Chevalley, still I felt accepted, and almost like one of them. I don't remember a single occasion when I was treated with condescendence by any of those men, nor an occasion in which my thirst for knowledge, and later my joy in discovery, was rejected by vanity or disdain. If it had been, I wouldn't have "become a mathematician", as we say – I would have chosen another job, in which I could reach my potential without having to confront contempt...

While objectively I was a foreigner in their world just as I was in France, yet something linked me to these men from another social class, another culture, another destiny: a common passion. I doubt that during that crucial year in which I discovered the world of

mathematicians, even one of them, not even Cartan of whom I was in some sense the student, but who had many others (less lost than I was!) noticed in me that same passion that inhabited them. For them, I must have been just one of a group of people listening to the courses and seminars, taking notes, but obviously not very up-to-date. If I distinguished myself in any way from the others, it was because I wasn't afraid to ask questions, which usually displayed my phenomenal ignorance of the objects and the language of mathematics. The answers might be brief or even surprised, but the flabbergasted eccentric that I was then never encountered a rebuff. I was never "put in my place", either in the free-for-all atmosphere of the Bourbaki group or in the more austere environment of Leray's course at the Collège de France. In those years, from the day I stepped out of the train in Paris with a letter to Élie Cartan in my pocket, I never had the impression of finding myself faced with a hostile clan or a closed world. If I have really known that inner contraction of the person faced with contempt, it was not in that world – or at least, not at that time. Respect for others was part of the air we breathed. There was no need to deserve respect or to prove oneself before being accepted and treated with kindness. Strangely, perhaps, it sufficed to be a person, to have a human face.

¹⁴ I have read your letter of June 30 with interest; it shows an ardor for modern mathematics for which I can only congratulate you, and if you come to Nancy for the next academic year, my colleagues and I will certainly be happy to guide you in your researches as far as possible...

¹⁵ Diverse studies in mathematics, no exam. (I have a B.A. and am studying with a view to future research. I intend to enter the CNRS in 1950.)

¹⁶ Mr. Grothendieck has worked very seriously this year on modern algebra and topology, which he didn't know. Starting in October, he will be working in Nancy under the direction of Mr. Dieudonné. It is extremely desirable for his scholarship to be renewed for the academic year, and also for the month of September 1949.

Attached documents

CIMADE?

EUF documents

Diploma photocopies (7)

Letters to Dagmar by Hanka (spring 1948) and Schurik (Christmas 1948)