

As I write this, the image of the Tree of Fraternity rises before my eyes, my memory is making discoveries. I think I can see the Tree of Fraternity surrounded by a two-foot wall faced with ashlar and supporting an iron railing five or six feet high.

Jomard was a rascally priest, like Mingrat later, who got himself guillotined for poisoning his stepfather, a certain M. Martin from Vienne, I believe, a former *Member for the Département*, as they said. I saw this scoundrel tried and then guillotined. I was on the pavement in front of the shop of M. Plana the pharmacist.

Jomard had let his beard grow, his shoulders were covered with a red cloth to show that he was a parricide.

I was so close that after the execution I could see drops of blood forming on the edge of the knife before they fell. This horrified me, and for I don't know how many days after, I was unable to eat beef.

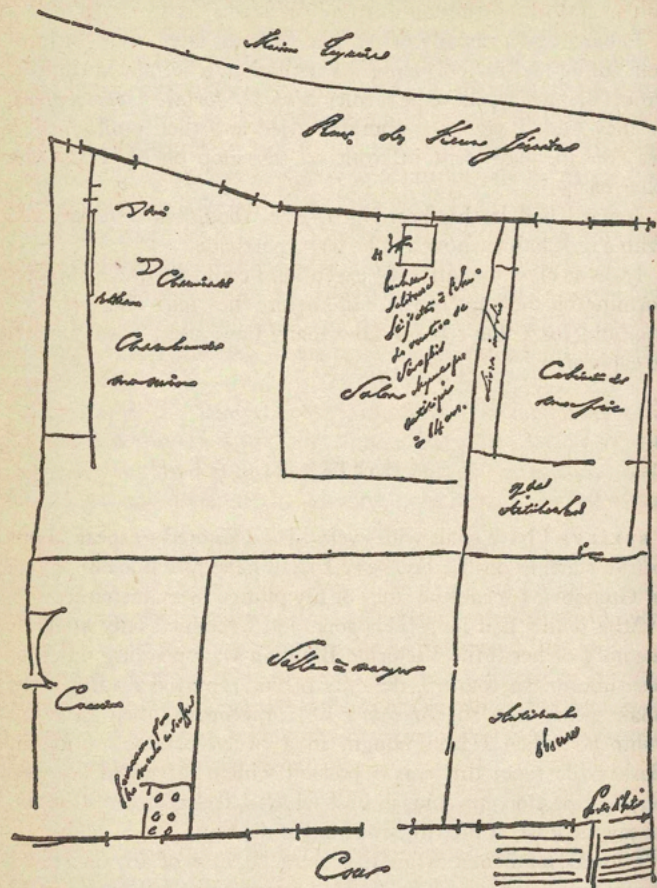
CHAPTER 34

I BELIEVE I have dealt with everything I wanted to speak about before starting on the last story I shall have to tell about things in Grenoble; I mean the story of my plunge in mathematics.

Mlle Kubly had long been gone and I retained only a tender memory of her, Mlle Victorine Bigillion was spending much of her time in the country, the only books I enjoyed reading were Shakespeare and the *Memoirs* of Saint-Simon, then in seven volumes, which I later bought in a twelve-volume edition in Baskerville type; this was a passion which has lasted like my physical passion for spinach and which I feel quite as strongly, to say the least, at fifty-three as I did at thirteen.

I loved mathematics all the more because of my increased contempt for my teachers, MM. Dupuy and Chabert. In spite of the grandiloquence and urbanity, the suave and dignified air that M. Dupuy assumed when he spoke to anyone, I had enough shrewdness to guess that he was infinitely more of an ignoramus than M. Chabert. M. Chabert, who in the social hierarchy of the bourgeoisie of Grenoble stood so far below M.

Dupuy, sometimes on a Sunday or a Thursday morning would take a volume of Euler or . . . and resolutely tackle difficulties. Nevertheless he always reminded one of an apothecary who



H. Myself swotting at abbé Marie. [Teisseires' house - Rue des Vieux-Jésuites - My mother's room. Me. Cheminée. Picture - Drawing-room. Solitary happiness. Here I was safe from being plagued by Séraphie. Foretaste of misanthropy at 14 years old - My father's study. Folio books - Second anteroom - Kitchen. Furnace for sulphur moulds - Dining-room - Dark anteroom. Front door - Courtyard.]

knows good prescriptions, but nothing showed how these *prescriptions* were derived from one another, there was no *logic*, no philosophy in that head of his; automatically, whether through education or through vanity, perhaps because of his religion, worthy M. Chabert hated the very name of such things.

Thinking as I do today, I wondered quite unfairly, a couple of minutes ago, how it happened that I failed to see the remedy at once. I had no one to turn to, my grandfather out of vanity had an aversion for mathematics, which was the only exception to his almost universal learning. People used to say respectfully in Grenoble that that man, or rather *Monsieur Gagnon*, never forgot anything he had read. Except mathematics, was the only answer his enemies could give. My father detested mathematics for religious reasons, I think; he only forgave them a little because they showed one how to *draw a plan of one's estates*. I was always making him copies of the plan of his properties at Claix, Échirolles, Fontagnieu, Le Cheylas (a valley near . . .), where he had just done a good stroke of business.

I despised Bezout as much as I did MM. Dupuy and Chabert.

There were actually five or six good mathematicians at the Central School who were admitted to the École Polytechnique in 1797 or '98, but they did not deign to explain my difficulties, which perhaps I could not set out clearly enough, or which more probably puzzled them.

I bought, or received as a prize, the works of the *Abbé Marie* in one octavo volume. I read this book as eagerly as a novel. I found in it truths set out in new ways, which pleased me very much and rewarded me for my trouble, but there was nothing actually new.

I don't mean that there was not really something new in it, which I may have failed to understand; I had not learned enough to see it.

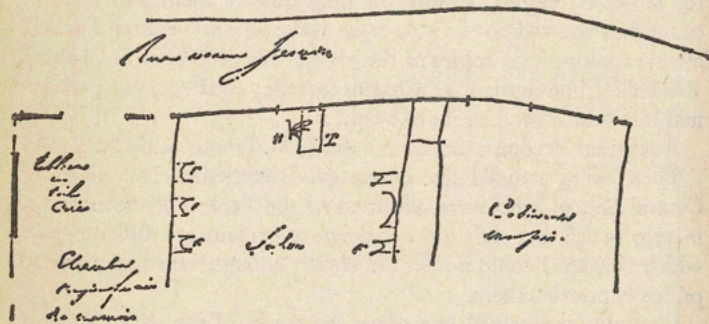
In order to ponder undisturbed I had established myself in the drawing-room, furnished with twelve fine arm-chairs embroidered by my poor mother, which was only opened once or twice a year to be dusted. I found this room conducive to meditation; in those days I still remembered the lovely supper parties my mother used to give there. At ten o'clock sharp, the guests would adjourn from the brilliantly lighted drawing-room

to the dining-room, where an enormous fish awaited them. This was my father's luxury; he still retained this instinct even after he had lapsed into devoutness and agricultural speculation.

It was on the table, T, that I wrote the first act or all five acts of my drama, which I called a comedy, while I waited for the moment of genius, much as if I expected an angel to appear to me.

My enthusiasm for mathematics may have had as its principal basis my loathing for hypocrisy, which for me meant my aunt Séraphie, Mme Vignon and their priests.

In my view, hypocrisy was impossible in mathematics and, in my youthful simplicity, I thought it must be so in all the sciences



FF. Big arm-chairs embroidered by my mother (Mme Henriette Gagnon) - T. Her son's work-table - H. Me at work. [Rue Vieux-Jésuites - My mother's room, always shut up. Blackboard of oil-cloth - Drawing-room - My father's study.]

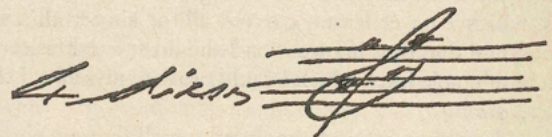
to which, as I had been told, they were applied. What a shock for me to discover that nobody could explain to me how it happened that: minus multiplied by minus equals plus ($- \times - = +$)! (This is one of the fundamental bases of the science known as *algebra*.)

Not only did people not explain this difficulty to me (and it is surely explainable, since it leads to truth), but, what was much worse, they explained it on grounds which were evidently far from clear to themselves.

M. Chabert, when I pressed him, grew confused, repeating his *lesson*, that very lesson against which I had raised objections, and eventually seemed to tell me: 'But it's the custom; everybody accepts this explanation. Why, Euler and Lagrange, who presumably were as good as you are, accepted it! We know you're very clever (which meant: we know you won first prize for *literature* and spoke well in front of M. *Teste-Lebeau* and the other Members for the Département). It seems you want to draw attention to yourself.'

As for M. Dupuy, he treated my timid objections (timid because of his pompous way of speaking) with a haughty smile that verged on aloofness. Although much less clever than M. Chabert, he was less bourgeois, less narrow-minded, and perhaps estimated more correctly his own knowledge of mathematics. If I could see these gentlemen for a week at the present time, I should immediately know what to think of them. But I always have to come back to that.

Brought up like a hot-house plant by relatives whose despair made them even more narrow-minded, having absolutely no contact with me, I felt things keenly at fifteen, but I was far less capable than another child of judging men and seeing through their various pretences. So really I don't put much trust in all the judgements with which I have filled the preceding 536 pages. The only part that's undoubtedly true is my *feelings*, only to reach the truth one must raise what I have said to four sharps.



[Four sharps.]

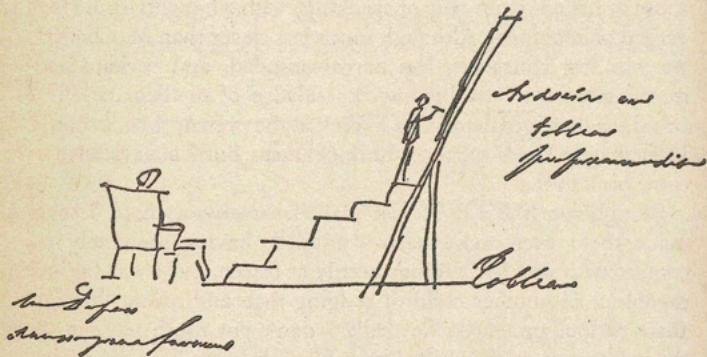
I express my feelings with the coldness of a man of forty whose senses are blunted by experience.

I distinctly remember that when I spoke of my difficulty about *minus multiplied by minus* to one of the *brilliant pupils* he laughed in my face; all of them were more or less like Paul-Émile Teisseire and learnt things by heart. I often saw them

ending their demonstrations at the blackboard by saying: '*It is thus evident*,' etc.

It's far from evident to you, I used to think. But to me the things in question were evident and could not be doubted, however hard one tried.

Mathematics deals only with one small aspect of things (their quantity), but on this point (and that's its charm) it only says what is certain; it speaks the truth, and almost the whole truth.



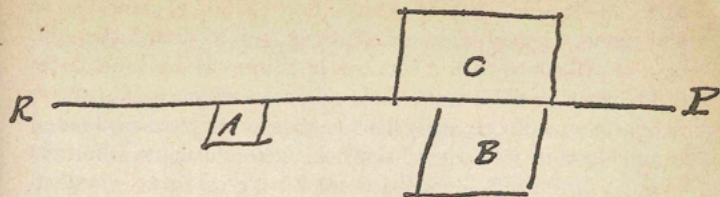
[Slate, or rather blackboard - Blackboard - M. Dupuis in his big armchair.]

In 1797, at fourteen years old, I imagined that higher mathematics, which I never learnt, covered all, or almost all, aspects of things, and that thus if I went on I should succeed in learning certain indubitable facts, which I could prove to myself as I chose, about *everything*.

It was a long time before I convinced myself that my objection about $- \times - = +$ simply couldn't enter M. Chabert's head, that M. Dupuy would never reply to it save by a haughty smile, and that the *brilliant ones* to whom I put my questions would always make fun of me.

I was reduced to what I still say to myself today: It must be true that $- \times -$ equals $+$, since evidently, by constantly using this rule in one's calculations one obtains results *whose truth cannot be doubted*.

My great worry was this:



Let RP be the line separating the positive from the negative, all that is above it being positive, all that is below negative; how, taking the square B as many times as there are units in the square A, can one make it change over to the side of square C?

And, to use an awkward comparison which M. Chabert's pronounced Grenoblois drawl made even more clumsy, let us suppose that the negative quantities are a man's debts; how, by multiplying a debt of 10,000 francs by 500 francs, can this man have, or hope to have, a fortune of 5,000,000 francs?

Are M. Dupuy and M. Chabert hypocrites like the priests who come to say [Mass] at my grandfather's, and can my beloved mathematics be a fraud? I didn't know how to reach the truth. Oh, how eagerly I would have listened then to one word about logic, or the art of *finding out the truth*! This would have been the right moment to explain M. de Tracy's *Logic* to me! I might have become a different man; I should have had a far better mind.

I concluded, with my wretched little powers, that M. Dupuy might indeed be a deceiver, but M. Chabert was a conceited bourgeois who couldn't admit the existence of objections which he had not considered.

My father and my grandfather had the folio *Encyclopedia* of Diderot and d'Alembert, which is, or rather was, a work costing 700 or 800 francs. It takes a great deal to make a provincial lay out so much capital on books, from which I conclude today that before I was born my father and my grandfather must have been completely on the side of the *philosophes*.

My father was always sorry to see me looking through the *Encyclopedia*. I have the utmost trust in this book on account of

my father's aversion for it and the definite hatred which it inspired in the priests who frequented the house. Rey, grand-vicaire and canon, a great papier mâché figure five feet ten inches tall, used to make a peculiar grimace as he mispronounced the names of Diderot and d'Alembert. This grimace gave me a deep, secret delight; I am still extremely liable to that sort of pleasure. I tasted it sometimes in 1815 when I saw noblemen refusing to admit the courage of Nicolas Buonaparte, as that great man was then called, and yet back in 1807 I had passionately hoped that he would not conquer England, for then where could one escape to?

I therefore tried to consult d'Alembert's mathematical articles in the *Encyclopædia*; their self-complacent tone, the absence of any cult for truth shocked me deeply, and moreover I understood very little of them. How ardently I worshipped truth in those days! How sincerely I believed it the queen of that world into which I was about to enter! I could not conceive of its having any other enemies but priests.

If $- \times - = +$ had distressed me, you can imagine what gloom possessed my soul when I opened *Statics*, by Louis Monge, brother of the illustrious Monge, who was to come and examine us for the École Polytechnique.

At the beginning of geometry textbooks we read: *Lines are called parallel when, if produced to infinity, they would never meet.* And at the beginning of his *Statics*, that egregious ass Louis Monge writes something like this: *Two parallel lines can be considered as meeting if produced to infinity.*

I thought I must be reading a catechism, and a very clumsy one at that. In vain I asked M. Chabert for an explanation.

'My boy,' he said, assuming that fatherly air which suits the foxy Dauphinois so ill, an air like Édouard Mounier's (Peer of France in 1836), 'my boy, you'll learn that later on'; and the monster, going up to his oil-cloth blackboard and drawing on it two parallel lines very close together,

said to me: 'Surely you see that they can be said to meet at infinity.'

I nearly gave it all up. A confessor who was skilful and a good

Jesuit could have converted me at that moment by commenting on this remark as follows: 'You see that everything is fallacious, or rather that there is nothing false and nothing true, everything is a matter of convention. Adopt the convention which will get you the best reception in society. Now the rabble is patriotic and will always defile that side of the question: become an aristocrat like your relatives, and we'll find some means to send you to Paris and introduce you to influential ladies.'

CHAPTER 35

IF THIS had been said enthusiastically, I should have become a scoundrel and by now, 1836, I should be extremely rich.

At thirteen, my picture of society was based exclusively on the *Secret Memoirs* of Duclos and the *Memoirs* of Saint-Simon in seven volumes. Supreme happiness consisted of living in Paris and writing books on 100 louis a year. Marion told me that my father would leave me more than that.

I think I said to myself: *true or false, mathematics will get me out of Grenoble*, out of this mire that makes me sick.

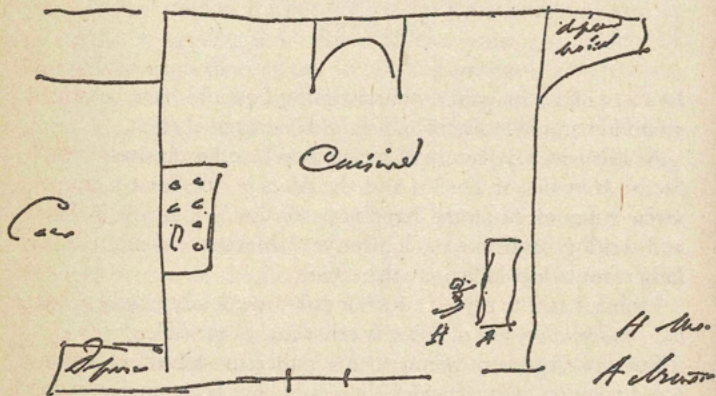
But this argument seems to me rather too advanced for my age. I went on with my work – it would have been too distressing to interrupt it – but I was deeply disturbed and depressed.

At last, as luck would have it, I saw a great man and I did not become a scoundrel. Here, once again, *the tale is greater than the teller*. I shall try not to exaggerate.

Adoring mathematics as I did, I had for some time past heard speak of a young man, a dyed-in-the-wool Jacobin, a great and fearless sportsman, who understood mathematics far better than MM. Dupuy and Chabert but did not teach it professionally. Only, as he was not at all rich, he had given some lessons to that sly-minded fellow Anglès (later Count and Prefect of Police, and made rich by Louis XVIII at the time of his loans).

But I was timid; how could I dare approach him. And besides his lessons were horribly expensive, twelve sous a lesson, how could I pay? (This charge seems too ridiculous, it may have been twenty-four or forty sous.)

I told all this, out of the fullness of my heart, to my kind aunt Élisabeth, who may then have been eighty years old but whose good heart and even better mind, if that's possible, were those of a woman of thirty. She generously gave me a number of six-franc pieces. But it was not the money that distressed my aunt, whose soul was full of the most legitimate and sensitive pride, but the fact that I had to take these lessons *without my father's knowledge*; to what well-founded and justifiable reproaches was she not exposing herself? Was Séraphie still living? I can't swear



[Courtyard - Pantry - Kitchen - Dark pantry - H. Me - A. Cupboard.]

to the contrary. And yet I must have been quite a child at the time of aunt Séraphie's death, for when I heard of it, standing in the kitchen beside Marion's cupboard, I fell on my knees to thank God for so great a deliverance.

This event, the six-franc pieces so nobly given me by my aunt Élisabeth, to enable me to take lessons in secret from that dreadful Jacobin, prevented me from ever becoming a scoundrel. To see a man made on the model of the Greeks and Romans, and then wish to die rather than not be like him, took but an instant: *punto* (*Non sia che un punto*. Alfieri).

I don't know how, timid as I was, I made contact with M. Gros. (Here the fresco has fallen away, and I should only be a contemptible romancer, like Don Rugiero Caetani, if I undertook

to fill the gap. Allusion to the frescoes of the Campo Santo at Pisa and their present condition.)

Without knowing how I got there, I can see myself in the little room which Gros occupied in Saint-Laurent, the oldest and poorest district of the town; it is a long narrow street huddled between the mountain and the river. I did not go into this little room alone, but who was my fellow student? Was it Cheminade? This I have utterly forgotten; the whole attention of my mind must have been fixed on Gros. (This great man died so long ago that I think I can omit the Monsieur.)¹

He was a young man with darkish blond hair, very active but very stout; he may have been twenty-five or twenty-six; his hair was very curly and fairly long, he wore a dressing-gown, and he said to us: 'Citizens, what shall we start with? Let's see what you know already.'

'Why, we know quadratic equations.'

And, like a sensible fellow, he began showing us how to do these equations, that's to say forming the square of $a + b$, for instance, which he made us raise to the second power: $a^2 + 2ab + b^2$, supposing the first member of the equation to be the beginning of a square, the complement of this square, etc., etc.

This was a glimpse of Heaven for us, or at least for me. At last I saw the reason for things; this wasn't one of those Heaven-sent apothecary's prescriptions for solving equations.

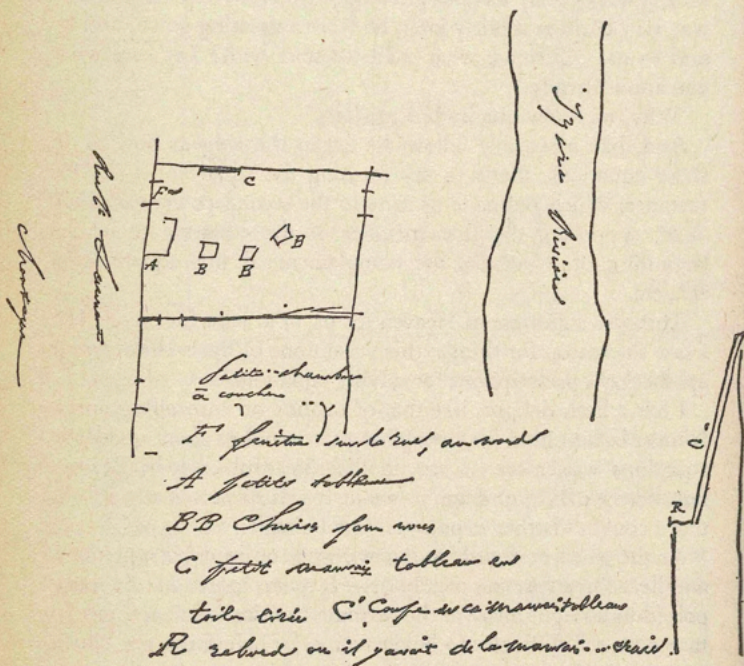
I felt a keen delight, like that of reading an enthralling novel. It must be admitted that everything Gros told us about quadratic equations was, more or less, in that dreadful book by Bezout, but there we did not deign to see it. It was so wretchedly set out that I couldn't bother to pay attention to it.

At the third or fourth lesson we went on to cubic equations, and here Gros was completely new. It seems to me that he transported us straight away to the extreme frontier of science, face to face with the difficulty to be overcome, or before the veil which had to be lifted. For instance he showed us one after the other the various ways of solving cubic equations, the first attempts of *Cardan* perhaps, then improved methods, and finally the present method.

1. To be placed: Races at la Grande-Chartreuse, at Sarcenas.

We were greatly surprised that he did not make us each in turn demonstrate the same proposition. As soon as we had really understood one thing he went on to the next.

Although there was absolutely nothing of the charlatan about Gros, he achieved the effect of that quality which is as useful to a teacher as to an army general; he took possession of my whole soul. I adored and respected him so much that I may have displeased him. I have so often encountered this unwelcome and surprising reaction that my memory may be at fault when I attribute it to the best of my passionate admirations. I



[Mountain - Rue Saint-Laurent - River Isère - Small bedroom - F. Window on to the street, looking north - A. Small table - BB. Our chairs - C. Bad little blackboard of oil-cloth - R. Ledge where there was some bad chalk that crumbled in one's fingers when one wrote on the board. I've never seen anything so wretched.]

displeased M. de Tracy and Mme Pasta by admiring them too enthusiastically.¹

One day of important news we talked politics during the whole lesson, and at the end of it he refused to take our money. I was so used to the money-grabbing ways of Dauphinois teachers, MM. Chabert, Durand, etc., that this straightforward action intensified my admiration and my enthusiasm. I think there were three of us on this occasion, possibly Cheminade, Félix Faure and myself, and I think too we had each put down a twelve sou piece on the small table A.

I remember hardly anything about the last two years, 1798 and 1799. My passion for mathematics absorbed my time so entirely that, as Félix Faure told me, I wore my hair too long then, so much did I *grudge* the half-hour that must be wasted on getting it cut.

Towards the end of summer 1799 my patriotic citizen's heart was deeply grieved at our defeats in Italy, Novi and the rest, which caused my relatives keen delight, mingled, however, with anxiety. My grandfather, who was more reasonable, hoped that the Russians and Austrians would not reach Grenoble. But to tell the truth I can hardly speak about my family's wishes except by supposition, for the hope of leaving home shortly and my keen straightforward love for mathematics absorbed me so deeply that I paid very little attention to what my relatives were saying. I felt, although perhaps I did not formulate it clearly to myself: as things stand with me now, what do I care about such drive!

Soon a selfish dread began to mingle with my patriotic grief. I was afraid lest, on account of the approach of the Russians, there would be no examination held in Grenoble.

Bonaparte landed at Fréjus. I accuse myself of sincerely wishing that this young Bonaparte, whom I pictured as a handsome youth like a colonel in a comic opera, might make himself King of France.

The term suggested to me nothing but ideas of brilliance and nobility. This stupid mistake was the fruit of my still more stupid

1. 29 [[anuar]y 1836. Rain and cold weather, a walk to San Pietro in Montorio where I'd had the idea of this towards 1832.