

Fourth part .
THE BURIAL (III)
or the Four Operations
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The Funeral Ceremony (continuation)

18.3. The last homework (or visit)

18.3.1. (1) Duty accomplished - or moment of truth

Note 163

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(16 February) Today there is exactly one month since I started impromptu thinking, p. 775 triggered by the reading of CG Jung's autobiography. I thought to spend a few days there, the time of throw the first strong impressions of reading on paper - and today I have not finished going around more of these impressions! They are enriched and transformed into reading lessons, by the virtue of work triggered by it and by writing my reading notes. I just had time to go around impressions arising from the first four chapters on Jung's early years - the written chapters of the Jung's hand himself. I was about to confront these impressions with others, not always concordant with first view, aroused by later chapters. But while I was going to get started today, I realized that this digression (which is already approaching a hundred pages ...) is really out of place in this other "digression", already long enough by itself, that I called "The key of yin and yang". (A digression I had thought it a month ago, it approached its end 313 (*).) It is true that my reading notes on Jung fit well into the dialectic of yin and yang, and that they led me too, without seeking it, to specify many things that had barely been touched before, both on my life, and on life in general. This does not seem to me to be enough, however, to open a parenthesis of dimensions as prohibitions within another parenthesis, placing itself in the ultimate chapter, "The Ceremony Funeral ", a long reflection on my burial. It would be time finally to resume this reflection and bring it to a successful conclusion

In the end, I will not include these reading notes in "The Key of Yin and Yang", or even in the Burial, with which they have only a tenuous link. These notes can be considered as a illustration of what I have tried to express, in general terms, in the notes (among others) "The surface and depth" and "Praise the writing" (n ° s 101, 102). I hesitate whether I will include them in Crops and Seeds, as a fourth part, or I'll make a separate text in Volume 2 of Reflections 314 (**). he

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While this thinking on Jung's life as it actually took place, is part p. 776 inseparable from the long reflection that I have been pursuing for a year, and which for me is called Harvest and 313 (*) (March 26) In writing this line, I was still under the impression that the note that I was going to begin to be part of "The key of yin and yang". It was only during the following days that I realized that another stage of reflection had already begun. "The key" therefore ends with the previous note "The endless chain - or placing (3)" (n ° 162 "). 314 (**) (March 26) Finally, these lecture notes will form (not the fourth, but) a fifth and final part of Crops and Semailles, which will undoubtedly be part of volume 3 (not volume 2) of the Reflections, with other texts of a more thematic. All the notes on the Burial which form the "third breath" in the writing of Harvests and Seeds, beginning September 22 last year, together I was thinking of doing a third part of Harvests and Seeds, will be divided into two separate parts, under the respective names "The key of yin and yang" and "The four operations", forming respectively the third and fourth parts of Harvests and Seeds.

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Seeds - and I'm directly involved, just as much as I'm everywhere else in these notes. It would be therefore artificial to separate from Crops and Seeds this part of the reflection, for the sole reason that it has hatched without warning in the middle of a Burial, and that it "overflows" a little too much on the central theme of it.

For the moment, I will take the opportunity of this break in my reflection on the autobiography of Jung, to return to my sheep, and finally to bring to a successful end, if do this, this Funeral Ceremony!

It is now time for me to give a brief account of my friend Pierre's visit to my home. last October. I note his arrival in the note of October 21 ("The Act" n ° 113), while

had just arrived the night before, with his daughter Nathalie (two years old). After the departure of my visitors (in the note "Paradise Lost" October 25, n ° 116) I write: "It will be time again in a few days to do point on what brought me this visit - a visit on which I did not count anymore. . . "These" few days " have become almost four months - but here I am at last!

I would have liked to make a narrative "on the spot" of this meeting, which represents for me an important episode in the adventure that was the discovery of the Burial, its reality and its meaning. But this time, I feel restrained by a concern for discretion, to deliver as it stands the totality of the multiple impressions and vivid that my friend's passage left me. It is true that I did not have such hesitation, to make to enter into my reflection one of these impressions (in the note of December 26 "Disavowal (2) - or the Metamorphosis ", n ° 153). But to mention a certain impression we had of such a friend at such a time, and make a quick description of the precise "moment" when such a diffuse impression suddenly became manifest, irrefutable - these are two different things. The second is a bit like taking a picture of a friend in a moment when he does not feel observed, and in addition, the

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circulate without having
p. 777

assured of his agreement. This is why I will confine myself to giving some impressions that this visit left me, and refrain (as elsewhere in Crops and Seeds 315 (*)) taking intrusive pictures!

First he would take me **locate** this visit. I had intended at first to see Peter at his 316 (**)
to make him read Harvests and Seeds, including the Burial. In early May, I wrote to him, for him saying that I would like to see him soon and have him read a text, especially for "my old friends and students of yesteryear in the mathematical world ", in which I had put myself whole "- I do not think I have never treated a text like this. "I thought then that the strike would be finished during the month, and proposed to come and see him in the first half of June. Finally, because of delays in the strike, not to mention the work to put the finishing touches to the Burial (as it was then planned, that is to say, essentially, which is now part I of the Burial), my visit was handed over several time, and in July and August Pierre was not in France. He had not shown any curiosity at the announcement the work that I wanted so much to give him in person and to make him read before any other. Finally I sent him during June the first part of Harvests and Seeds, "Fatuity and Renewal", thinking that it would be a good thing for him to take note of it, before taking the Burial to him - sometimes that my reflection on myself "makes tilt" at home and triggers something - you never knew! L was got sick for ten days, and it was not any more question for me to go to Paris soon.

I was impatient however to make him read the Burial, where Pierre was involved in a neuralgic way, and 315 (*) There is an exception though - namely the "photo" I took JL Verdier during a telephone conversation in notes "The joke - or" complex weight "" (n ° 83). I also remember that to make the description "on the spot" of the small scene, I had to silence a certain reluctance in me - I had the impression of having extended a sign to my ex-student, something that is absolutely not in "my style". Of course, I was delighted too, and very happy with myself, engulfed in sails deployed in this panel, yet larger and more apparent. Well done for him!

316 (**) I expressed this intention at the beginning of the note "Friends" (n ° 79), and in the first footnote on page one.
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I would have liked him to come and see me at home, before he left on vacation. It's in these provisions that I sent him the complete Introduction towards the end of June, as well as the table of contents of the Burial - I thought it would shock him, and

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he would be keen to come see me before his departure p. 778

to know in detail what I had to say about this famous burial and about the role that was devolved to it. Instead, I did not have any sign of life from him until late August - to the point I wondered if he had received my shipment. It was the big suspense! In his second letter after his return (dated August 25th) he finally said a few words about the introduction and the table of contents, in terms that seemed to me most evasive. "I had the impression that you did not know much about the love were surrounded by your "orphans". . . ", he writes, and he encloses a commented bibliography in support, a sign of manifest goodwill to dispel what he seemed to be feeling like a sorry misunderstanding.

In his next letter (from September 12th), he announces his move to Princeton for the 7 October, and told me that he would try to make a jump home by then. Not receiving any more sign of I thought he's gone to Princeton - and no, calling IHES I learned that his trip had been delayed. And a week later, when I did not expect to see him for a long time, here he is. flesh and bone, in the company of little Nathalie!

(February 17) The meeting took place in an atmosphere that, according to all appearance, could not have been peaceful and friendly. A superficial observer who might have been around would have sworn that Peter was

in the process of writing a mathematical manuscript, and that from time to time he submitted to me his observations and constructive criticism of mathematician well "in the blow". For Pierre himself, he had to be well understood that he had come running (out of respect for me who had been, after all, his "master"), making the sacrifice of two precious days of a man who is very much taken, to contribute his best to dispel an unpleasant misunderstanding, Alas, who had crept into me, by some unfortunate coincidence of circumstances. As well good faith that mine were certainly above suspicion and there was no need even to report, so much was self-evident. Its role, on the other hand, was to enlighten me on all material details that seemed not entirely clear in my notes, or on which I could have made a mistake. He made a list of his observations as he read, and he submitted it to me the day he left - I had the good sense to take good note on the field, by key words. He has indeed been able to read, two days, the biggest of the Burial I, and in any case, all the notes (marked on the table of contents, and internal references to the text) which directly concerned his person. A beautiful

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performance, if p. 779

consider that I had two full-time months to write these notes ...

Little Nathalie during these two days was the wisest of the wise little girls. It hardly if I can say that I heard the sound of his voice - whether to speak, to cry or to cry. She does not I did not seem to like it at home, but did not show much. As for his dad, he was the real daddy model - always available at the right moment, to make eat, to walk or to bring to sleep a little girl not demanding nor contrarian for a penny. He had brought it, he told me, because after the big ones preparations for the move to Princeton, the mother was too busy cleaning again from Nathalie. But beyond this practical reason and force majeure certainly, I thought I felt another reason, which remained in the unsaid, surely, the presence of the little girl put a note of sweetness in the atmosphere of a meeting that my friend, without perhaps wanting to recognize it even in his heart, apprehensive. And this presence was at the same time the living sign, radiant, of these tacit dispositions in which he had rushed, in the scramble of moving to the United States - provisions in good faith patente and good will just as obvious.

On my side, I did not have the slightest intention to shake my friend, to make him approach whatever
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it was - I was at his disposal to go deeper with him on such an issue in which he would feel prompted to enter. He found he was holding above all not going **into the merits** of any of the numerous situations examined in my notes, where his probity as a mathematician (or his probity quite simply) was clearly cause. An observer who would have heard our conversation, which sometimes even turned to the theme (something that had not happened between us for over three years ³¹⁷ (*)!), would have suspected that in the text that my friend was commenting on, there could have been anything that put him in question so little bit personal. As for me, I felt that my friend clung firmly to this fiction, painfully maintained, of the best faith patente in the best of worlds. He carefully avoided all that could have broken it, by showing that this tacit "consensus" that he would have liked to establish between us, against all, was not a reality, but a fiction precisely, playing the role of "straw" to what to hang on. . .

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During these two days, I felt how false the situation was, filled with anxiety under these
p. 780

peaceful outside and good child. It was like with the rope in the hangman house, which nobody talks about while everyone thinks about it! I ended up making a remark in that sense - I think it was day of departure, after lunch. I said, basically, that I was pretty blown away from the a tea room that our meeting had; after all, in those notes that he was reading, and in the introduction already that he must have received almost four months ago, I had expressed myself in fairly clear terms and enough highlights a number of **acts** of his own. Did he really have nothing to answer me about it? He had me replied, with fuzzy eyes and a pale sourrire, a little miserable, that he was trying his best to "get preserve" - without specifying (as far as I can remember) what he was trying to "preserve", surely, my inquiry was to be felt by him as a violent intrusion into a life that had hitherto seem more peaceful and without problems - where everything was itself sound surprisingly **docile**; at such even docile, perhaps, that he had finally forgotten that it could be otherwise. **Assume** the position in which he has placed himself, that is to say, simply confront himself with it, examine it as it is - it would represent such an upheaval in his vision of himself and the world, such a collapse of the rigid structure of the ego, that most will prefer a thousand deaths and put the world on fire and by blood (if they can), rather than take the risk of such a leap into the unknown. That all of that, surely, that my friend had (and no doubt still holds today) to "preserve himself". I should not be surprised, having seen this kind of scenario recurring hundreds of times, expression the great fear of the reality of things and above all, beyond this, the risk of renewal

inside. I should not be surprised, and yet, every time again I am surprised, when I see the most glaring evidence, and suffer and inflict a thousand torments, for the sole purpose of avoiding what I know well, and of sure knowledge, to be the greatest of blessings. . .

Still, after this unsuccessful attempt on my part to "leave the rails", the conversation turned short. These minutes were I think the only ³¹⁷ (*), during the two days, where our conversation took a person turn

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- or something was said that went beyond the fiction of "consensus", maintained

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despite the evidence to the contrary! I fear that, as often, I did not have the opportunity to "roundness" affectionate, and yet without detours, that could have helped my friend, by dramatizing an atmosphere which, in spite of appearances, was stretched to the extreme, and this already for months. While I am limited to going about my household, gardening and writing, leaving my friend to read, and also during meals, taken together, there was in me a silent **expectation** vis-à-vis my young friend - the expectation of a **response** to what I told him, through this text in his hands.

³¹⁷ (*) On the cessation of all mathematical communication between me and Deligne, see note "Two turning points" (n ° 66).

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This expectation, he could not not feel it - and he knew well, basically, that it was not his few poor material precisions that "answered"! surely it would have been a relief to him that I take the lead one way or another, even starting with a neat shouting and he had not stolen it either, and finally makes **contact**, where there was none.

It is true that in the past fifteen years, every time I tried to raise with him personal thing and that was close to my heart, I had run into complete silence, or (when it was voice) with astonished inflections of rigor, in the purest style "velvet paw". I did not want to, of course, to play that game, I was also left without thought of return since the "turning point" of 1981 ³¹⁸ (*). But he is also true that this time there was a "moment" visibly unique in the relationship between us, and that would have maybe deserved a sprain of a rule (or a habit, become second nature ...), not to go against the reluctance of others to approach this or that. Sometimes it can be good (and in some limits) to "force the hand" so little, a bit like a kid that would bring to the dentist despite the fear (irrational) that he can have. . .

I do not say all that, just to pity poor friend Pierre who has not received from me all the benevolent encouragement he might have wished to find, and what more! After all, it's normal that I have my limits, like everyone else, and moreover it is not necessarily my role and even less my obligation to cushion shocks for those who have put themselves in situations (even if they were not aware of them) who risked to fall back on them one day or another and one way or another.

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Besides, after Pierre and Nathalie escorted to the station Orange, 22 October in the evening, I had ^{p. 781} not at all the feeling of a "meeting for nothing", an "opportunity missed". I did not have naivety to expect me to do wonders - it's so rare for two people to come to the bottom of a question which deeply concerns them both! There was no dialogue, it's something heard - and yet I felt that I had learned many things. There had already been these "material details" of course, of which more than one was very interesting, and that put last points on last i, with regard to the question of the only "scenario" of certain operations that had taken place, and their contexts. I will come back, in continuation of the note ³¹⁹ (*). What was more important was that during those two days, I observed my friend with new eyes, in light of what I had learned from him during my reflection on the Burial, I can say that I "rediscovered" with him - in his relation to me, to things, to his daughter. . . This chapter remains a reserved area - this is where the natural reserve that I mention at the beginning of today's notes.

But in the context of an understanding of the Burial, there was another reason especially, more subtle than the previous two, for which it was important that this meeting take place. I think I had felt this importance from the moment I decided to go to Paris to meet my friend, but I would not too much to say then why, apart from the fact that it is always important to speak in person with the person concerned, if you can do it when there are things of consequence that involve both. Yet we did not not talk about these things, precisely - yet I had the impression of having learned about the **reality** of the Burial, which I still had to learn.

I could say that too. Before this meeting, all the circumstances and the facts and constitute the Burial seemed so **improbable** point zany, wacky, that despite all the tangible, undeniable, material "proofs" that had accumulated over weeks and months, and despite some three hundred pages of notes I had already devoted - somewhere deep inside me, I

³¹⁸ (*) See note already cited "Two turns" n ° 66.

still can not believe it 320 (**)! This

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is not the first time that such a thing happens to me,

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far from it - that a tenacious doubt is maintained for some time, tenacious remnant of the resistances against the setting from an old vision, a vision that is often more comfortable, or more consistent with consensus currents, than the one that took over. Sometimes this doubt is not the expression of the only inertia against a creative change in the vision of things, but it is also a reflection of a healthy element, valid in the old vision of a **real** aspect of things, which was perhaps dropped a bit too hastily by Above board, with the rest! Still, as every time a doubt manifests itself, the good thing to do is to become aware of it (which is not always obvious, given the inveterate reflexes of "silencing" the unwelcome doubts), and, this fact, to examine it carefully. I do not remember one time where I would have examined a doubt carefully, without having learned anything of interest (or even me), and likely more to faint doubt 321 (*). Any doubt is the unmistakable sign of a job which needs to be done.

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In the case in point, to know that of my unspoken doubt, perfectly irrational, about the very reality

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of a so-called "Burial", I must admit that before this meeting with my friend, I was not even arrived at this first prerequisite to all work: I had not really realized it. He remained in the state of a single diffuse **discomfort**, and does not say his name - blame me to question! I noticed after blow of the discomfort and of its meaning, at the moment when it had just dissipated, by the virtue precisely of the meet with my friend. I believe that this effect would have occurred, whatever the attitude by him - that it is that of a kind of collaboration eager to provide me with all the "material details" missing (as it has been), or, on the contrary, that of a vehement, furious denial perhaps, the most obvious facts. In all cases, the **psychic** reality of the burial could not failing to appear to me, this time by direct perception (and not by "induction" from documents, and by subtraction from other facts to my knowledge etc.), seeing my vis-à-vis purely **ignore** and simply the ubiquitous absurdities of the version "the best of the possible worlds", absurdities of which the enormity itself had just made me doubt, first of all, in my heart, the reality of the Burial!

To give just one example: I had to learn from Deligne himself that he did

learned the "theorem of the good God" from the mouth of Zoghman Mebkhout himself - but that he did not want

320 (**) This **disbelief** at the evidence of our healthy schools when they jostle too violently consensus currents or ways to see that we hold dear, was already mentioned in the note "The Chinese Emperor@robe" (n ° 77) Obviously, the writing of this note was a way, for me, to get beyond (at least partially) this incredulity before the evidence, by putting your finger on this inveterate reaction. In doing so, however, I **distance** from this disbelief, presented as that of ordinary mortals (adults), identifying with the "little child who believes the testimony with his eyes" (" even though what he sees is rather unheard of, never seen yet and ignored and denied by all "). my subconsciousness in writing this note - taking my distance from an attitude of disbelief towards my own faculties, and in relation to a gregarious instinct of "doing like everyone else". Such attitudes and instinct exist well and truly in me as in everyone, but (as with everyone else) they remain mostly unconscious. So it was as an attempt to exorcise that in me that alienated me from myself - and this attempt will have mostly the result, I think, to **delve deeper** into the unconscious what I wanted to distance myself. Insidious doubt, acting as a secret breach in my knowledge of things, was not eliminated so far, nor "outdated" ("at least partially", sic) the unfortunate disbelief!

I realize again that in this moment of reflection, it remained below what I call "meditation"

- which is a reflection in which dark and delicate inner movements (such as this secret disbelief, and the true one motivation in me writing the note, which was to "exorcise" this annoying disbelief) remain constantly the subject of a watchful attention.

321 (*) It would be more accurate to say that doubt turned into **knowledge**, which has taken its place. It has nothing in common with what happens when we hunt (or "go over"!) a doubt, which has the effect of making it disappear from the gaze, while took refuge (or was exiled ...) in invisible, deeper layers. It is farther than ever to be resolved (and transformed informed), and continues as ever to act in the manner of a secret **flaw**, a malaise, a sign of work remain evaded. Compare this with the comments from the previous footnote.

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refer to it in his article with Beilinson and Bernstein ³²² (*), **scruples** (!) vis-à-vis Kashiwara, being not sure (as a layman) what was the part of the one and the other in the said theorem ³²³ (**) - he will I had to hear

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Deligne speak in these terms, so to see me this strange combination p. 785 a good faith of detail, and a bad faith phenomenal and radiant in the substance and in the essential. I did not think it would be useful to draw the attention of my friend to the curious way (highlighted in the note "The Conjurer "(n ° 75)", that started off well read!) He it was taken for this result "which should have find its place "in its article, to give the appearance that it was none other than him (or at least, one of the three authors of the prestigious article) who was the brilliant author! He also had no explanation to propose to this strange fact, that this Colloquium which I called the "Pervers Symposium" was done, essentially, in the wake of the works and philosophy developed by Mebkhout in previous years (something Deligne that was not mine also contesting ³²⁴ (*)), but his name is yet rigorously absent from the Conference proceedings published in Asterisk ³²⁵ (**). He seemed to consider this a kind of unfortunate **coincidence**, when he nor anyone else were for nothing. In short, what I called the Burial is reduced to my friend Pierre to twenty or thirty such "coincidences".

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I found the game I knew well at home - not just at home; a game where we fooled p. 786 with the most innocent look in the world, with the certainty of never being stuck. And it©been a while in effect that I no longer waste my time trying to convince anyone (for example) that some so-called "Coincidences" are not mere coincidences. It can be helpful sometimes to point out things obvious, but once done, it©a waste of time to try to convince anyone that they are of **things** , in fact, not fantasies, qu©iez you so look there! It©a waste of time to wanting to convince bad faith, that it is conscious or unconscious, is the same, and to take the face of idiocy, or of finesse - it©the same again.

³²² (*) See notes "The unknown service and the theorem of God" (n ° 48 ©and "The Iniquity - or meaning of a return" (n ° 75) and the notes that follow it, forming with it the Procession "The Symposium - or harnesses Mebkhout and perversity."

³²³ (**) Of course, there is no more references to Kashiwara Zoghman Mebkhout in Article Beilinson, Bernstein and Deligne, developing the formalism of the said bundles "perverse" (not to call them "bundles Mebkhout"), from philosophy Mebkhout-ever-appointed. Deligne also knows better than I the role of Kashiwara in Theorem of God (aka Mebkhout): the constructability Kashiwara theorem allows Mebkhout set up the functor a triangulated category coefficients "continuous" (complex differential operators) to another formed coefficients "Discrete" (Plot) - something that nobody in the world had thought of doing before him, and even less, we suspect have an equivalence of categories. It was then the "missing link" in precisely the duality formalism that I developed for ten years (1956-1966), and my cohomologistes students Deligne head, hastened bury after I left in 1970.

³²⁴ (*) Deligne has merely pretending to be qualified somewhat my vision, saying that in his opinion the influence of ideas MacPherson in the Symposium Luminy June 1981 (called "Perverted Symposium") was even more important than Mebkhout. I was not quite in the game to discuss the matter on parts, and it was obviously a point of detail, which hardly mitigate the enormity of what happened. Deligne has not disputed that neither the Symposium in question or the renewal of large scale in the theory of cohomology of algebraic varieties, it was a sign, would have occurred without the Mebkhout pioneering work in the years prior, and without that philosophy was developed in complete solitude.

I grew to understand that the idea of MacPherson of the "intersection cohomology" varieties developed by independent him ently Mebkhout ideas, was a little dead letter until the "philosophy" of Mebkhout has lit new light and unsuspected (thing discovered by Deligne). It was the strong start of the theory of bundles Mebkhout (wrongly called "perverse" in lieu of a Symposium...). This starter is **Event** principal said Symposium and (seems it) a turning point in the history of our understanding of the cohomology of algebraic varieties. The keystone for this new understanding seems well theorem of God, who "was in the air" since the beginning sixties and neither I nor (later) does Deligne had arrived to clear.

³²⁵ (**) The term "strictly off" is true to the letter, at least for volume 1 of the Records (formed of the Introduction and Article Beilinson, Bernstein, Deligne), which is the master portion of the Symposium. There are two references to inch Mebkhout in the bibliography at two articles of Volume 2 (one by Brylinski, the other by Malgrange), none of which regarding the paternity of the theorem of God.

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But what had changed however when we met, and that put in my friend a note of anguish he was doing his best to control and conceal is that this time that game no longer limited to small sports inconsequential between four eyes, neither seen nor known - and with a **late** , again! This time the cards are open on the table, and it©a **casual game** . The paris are open, what will endorse and condone famous Congregation. It is true that much has already tolerated much endorsed, for ten or fifteen

years, and it will probably continue, who knows? As my friend Peter, it is perhaps not twenty or thirty "Coincidences" near ...

(18 February) When I finally escorted Pierre and Nathalie at the station of Orange on October 22 evening, I felt very silly. Pierre looked a who fulfilled scrupulously and meticulously everything duty, according to the timetable it had set - and I felt a dull frustration that nothing had been said nor discussed during the meeting which had taken place at last for months it was mentioned. It was night, the small (in the back seat) had to sleep - there were for a minute quarantined car to the station, conducting dry. We stayed a long time without speaking. It is I who have broken silence, under the pressure of this dissatisfaction in me seeking some outlet; discontent with myself surely, rather than anyone else. It remains that I had gone there to tease just my friend. I told him that I was not yet clear with myself if I was not going to bring legal action against the house Springer, to force him to withdraw from circulation

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the volume-pirate SGA 4 1
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published in Lecture Notes 326 (*). I would even say too knew when I had been touched by this idea, I ressentais there just in case, as a way also to probe a little my friend ("ihm auf den Zahn fühlen", as we say in German). He did not react too actually, it was a monologue rather I did, by taking a "thread" that I had dropped there was a long time ago, in April or May probably. I realized, then the following, a simple test of legal force does not rhyme with much at the bottom - that the thing would have little meaning, remove SGA 4 1

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Traffic in its title and presentation

current, if the initiative came from someone other than me - or the Springer or, better yet, who knows, Deligne itself. I had to chain it did not seem like a luxury, that he makes such Deligne public gesture, as an apology in fact for some vis-à-vis acts of me. it would clean an atmosphere that needed it!

My friend followed my monologue in monosyllables, placed here and there. He suggested that Springer would perhaps not so delighted to sell off its entire stock of copies of SGA4 1

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- is what I

retorted that it was sufficient that currency hedging, as he had done on another occasion and without Problems 327 (**), it had not have cost him dearly. Even assuming that the stock sold off - a title of Lecture Notes on more than one thousand, you talk if it would pass to the profit and loss! Not considering Deligne him, assuming there really yours, he had a few million old francs it needed to cover the shortfall. . .

I did not have to say, but it was understood (and surely heard) what was at stake, it was perhaps more value than one or two months salary of one of us. I had to still end up saying that in this stuff, what matters in the first place, it is not to see **how to** do something (or, Instead, list the **obstacles** to do so), but to be clear first on what we **want to**

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do .
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326 (*) On this volume, see in particular the four notes "The accomplice," "The clean slate", "Green light," "Reversal", n ° s 63 " ©67, 68, 68©

327 (**) It was during my first misadventure with the Springer publishing house, which published the notes of Hartshorne (On a course where I had developed the formalism of local cohomology), specifying the author Hartshorne. It was volume n ° 41 "Local Cohomology" of Lecture Notes, where we had to change the covers. Springer had the house courtesy to apologize then the maldonne, and work diligently to fix the error. The mores of the house have changed since. . .

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Once done, the rest is housekeeping matter, and "follows" (when she wants to "follow" indeed). Blame it on my loquacious interlocutor to explain his true feelings, I took as much heard that he was well aware that it would be good to "clean", in short, a situation who needed it - but simply remained undecided on what he was able to do it, history "Keep face" without doubt, things like that. I was "next to the plate" in fact! I ended up myself see, when we were already on the station platform waiting for the train. That was when Deligne is Income thing, a look a little sheepish to say that eventually he would prefer it be **me** who

contact Springer about SGA 4 1

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. Obviously he did not want to interfere or even, at this time, only to forward an opinion on the fate in the book which he was nevertheless the author (with it is true, my "collaboration" 328 (*)).

It was only then that I realized that my thinking decidedly for our way was a monologue - and to my friend Peter, it was still not clear that there was something perhaps not very "in order" to some "APG 4 operation 1

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- 5 USG "It is surely no coincidence, too, if it is on this theme there between all that I branched, seeking outlet for my dissatisfaction. It is this operation related massacre rule a great job where I had put the best of myself 329 (**) that had me most affected - by a blast of violence (in the massacre) and quiet impudence (vis-à-vis what had been massacred). And I was hit again, by this (that I knew only too well my friend) in short it was nothing to do it, to him, the "ideas" that I could get about of this and that.

The train was soon to arrive, and it was the first time I aillais get in a few words, **in the bottom** of something that was close to my heart, in favor of **emotion** that finally surfaced. It was not long, to say in person what I felt about it. They were true feelings of someone injured in a sense of decency, by someone he affection and who has played with him - it was not the some literature on the edges, we conscientiously annotated with pencil in hand.

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He was puzzled suddenly, marking still somehow keep his unflappable composure. p. 789

I had to tell him something like: "So, you think that it was a beautiful thing as" SGA 4 1

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to suggest that it is the things that come **before** SGA 5 - where you had learned before eleven, math who served you every day until today still! ". He said the tone of someone reciting a lesson, that if he had called SGA 4 1

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It was only to indicate a relationship of dependence **logic** , and not prior art.

So he gave me was to hear my ears and mouth of the person himself, this "Stuffing" for such a huge point that I had hardly believe the evidence of my eyes, when I had read black on white, in his first pen (in "SGA 4 1

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"), Then under that of Illusie (in the volume called SGA 5, which followed, as it was "logical" that of my predecessor. . .)!

I had to tell her that he knew just as well as I that SGA 5 is "held" fully, without pre-guesswork of any kind, and that it depended neither logically nor of any other kind contributions later. I looked him straight in the eye when speaking to him, and as he told me. He repeated the lesson of the same weak voice, SGA 5 well logically dependent on SGA 4 1

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- but I saw in his eyes flickered he knew as well as me what it actually was. His eyes were more honest, despite themselves, his mouth.

So he ended up between us, the "moment of truth" - but no, camera or magneto

328 (*) See note on the subject "The reversal" already cited, n ° 68.

329 (**) See footnote "The Massacre" (n ° 87) and the two notes which follow it.

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phone, could not detect it. There was then that he and I to know what was happening. The train arrived in the minutes that followed, I think. Anyway, for that day, there was nothing more to say.

18.3.2. (2) Points on the i

Rating 164 (20-21 February) To complete retrospective of the last visit (in October last year) of Deligne home, I would like to review here the clarifications he has kindly bring me some number of points, which remained vague in my reflection notes on Burial I, even erroneous. it will be an opportunity for me to also bring some additional details, prompted by those provided by Deligne.

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p. 790

I Reasons (volume "Lecture Notes 900").

1. Deligne I said the main purpose of the volume LN 900 ³³⁰ (*) was to develop a "theory body abelian classes **Motivic** "over a number field $K \subset \mathbb{C}$, finite extension of \mathbb{Q} . In other words, in determining the "motivic Galois group of K over K , made Abelian". In this regard, I remember that I was the first (and for good reason!) to raise this issue, in the late sixties. The issue has a specific meaning for a term chosen pattern, using the "free functor Betti" on category of motives over K , with the inclusion of K given in the body of the complex \mathbb{C} . In fact, I had asked a little more general question of determining the **motivic Galois group** " **métabélien** " K / K deduced from the motivic Galois group by making full Abelian, not all proalgebraic group but only its neutral component. We had to get a completely canonical extension of profinite group $\text{Gal}(K / K)$ by the pro-projective limit of the torus (toroid on \emptyset associated with) multiplicative groups L^* sub-
The finite extensions of \mathbb{C} / K . I remember that Serre was very intrigued by this question, but neither he nor I (nor Deligne, of course I had put in it) did manage to improvise a "candidate" plausible. That question then fell into complete oblivion, like yoga reasons which it originated. this silence is broken only in 1979 by Article Langlands (that tells me Deligne in a bibliography commented reasons, in its letter dated 05.28.1984) ³³¹ (**) article where my idea of motivic Galois group would be first explained in the literature. As I have not had the honor to receive a prize apart from this article, I do not know if there is made allusions to my modest person. The next appearance of the grounds in literature seems LN 900, where all referring to myself as having something to do with the theme and the main problem of the volume, is missing ³³² (***)).

2. Deligne me clear that, contrary to what I had grown recognize

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(After a certain "style May-

p. 791

his "...), Article Deligne-Milne in LN 900, taking" ab ovo "Galois theory classes

tannakiennes (***) developed by NR Saavedra, was written almost entirely by Milne ³³³ (*). Line

also explained to me the error that was found in the work of Saavedra, which required (if we wanted to have the

³³⁰ (*) For details on this "memorable volume", see the two notes "Memories of a dream - or the birth of reasons"

and "The Burial - or the new Father", n ° s 51.52.

³³¹ (**) It is Article RP Langlands "automorphic representations, Shimura varieties and motivated. Ein Märchen Corvallis", in Proc. Symp. Pure Math. 33 (1979), AMS, vol II P. 205-246.

³³² (***) (April 8) I recently learned that the patterns are used in a Deligne 1979 article (published in the same volume as Langlands cited in note b. p. former).

(May 12: this "end" became the sub-note "Pre-exhumation", n ° 168 (iv))

³³³ (*) About this article Deligne-Milne, see note "The Burial - or the new Father" (n ° 52), and also comments in the subsequent note "The clean slate" (n ° 67).

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formalism of Galois theory Poincaré functors fibers) to reinforce the definition of a Saavedra category called "tannakienne". Work in the Deligne-Milne©article is limited to this adjustment,

Obviously once the identified error. It also raised the question, interesting, characterization

handy internal \otimes of categories that are "true" tannakiennes categories (might be called more

suggestively, \otimes -**categories Galois Poincaré**, as it is for them that we can develop a theo-

a series groupoid Galois Poincaré ³³⁴ (**)). This issue was not discussed in the article,

and has also not yet received a satisfactory solution. Obviously he was not performing or

solving interesting mathematical questions, but to provide a substitute for reference

Article Saavedra. (On this subject see the end of the note "The clean slate" (n ° 67).) ³³⁵ (***)

3. On several occasions in the Burial I, I highlighted the fact that the theory of Hodge-Deligne, developed by Deligne in the late sixties, was a first step towards a theory of "coefficients

Hodge-Deligne "on a scheme of finite type over \mathbb{C} , and to a" formalism six operations "for such

coefficients. I was (and I am) convinced that, if it was a deliberate among Deligne against

some of the key ideas introduced by me (such as that of formalism of the six operations), the theory of

Hodge-Deligne would arrive today "full maturity". Deligne has already stressed that the only definition

coefficients of a class of Hodge-Deligne on a scheme of finite type over \mathbb{C} , ran into difficulties

Serious

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his, he would not have been able to overcome. (There have been even more imperative to **make** clear that p. 792

issue from the beginning of the theory, as well as closely united, the formalism of the six operations

for such coefficients thing Deligne has always kept to.) According to him, the point of view of Meb-

khout and beam Mebkhout ³³⁶ (*) should provide a means of approach to the right definition.

(And if there had not been this deliberate, Deligne would certainly not expected to develop Mebkhout

philosophy that it has developed (against the current of his older), and to use for work visibly
ment fundamental that for fifteen years rest on the floor and still not only reported in the
literature, except by me in Crops and Seeds!)

4. I thought, wrongly, remember that I introduced the "filtering by weight" of a pattern, reflecting
(For all l) in the corresponding filtration on achieving l -adic of this motif (defined in terms filtration
of absolute values of eigenvalues of Frobenius). In fact, Deligne reminded me that I had worked
with the concepts of "virtual" weight (returning to work with virtual patterns, elements of a
"Grothendieck group" suitable. . .). This is Deligne who discovered this important fact, that the notion vir-
tual I worked with should correspond to a **filtration** canonical, by "increasing weight" ^{337 (**)}.

334 (**) The term "groupoid" (Galois-Poincaré) has the advantage of suggesting the close relationship with the concept of fundamental
groupoid

mental of a topological space or topos. Technically speaking, however, the name of "wreath" (Galois-Poincaré)
would be more appropriate. This is the sheaf of "fiber functors" defined not only on the basic body of the k \otimes -category
considered, but any objects on the site fpqc diagrams k (with particular attention to objects
this site which are of the form $\text{Spec}(k)$, where k is an extension of k , or even an extension **finite** k).

335 (***) (May 12) Having considered the book recently quoted Saavedra, it now appears that this one, and the same name
("tannakienne category") of this notion that I had introduced around 1964 and which gives its name to the book, is a **hoax** .
I disassembled in detail in the remainder of notes "The Sixth nail (in the coffin)" (n o s 176 1 to 176 7).

336 (*) These are the beams that Deligne was introduced as the "perverse sheaves." (See about the two notes "The Iniquity
- or meaning of a return "and" perversity", n o s 75, 76.) It was not annoying and kindly, in our conversations,
called "bundles Mebkhout". . .

337 (**) The heuristic reason Deligne convinced of the existence of such a filtration (necessarily unique) of a pattern,
is that there are non-trivial extensions of Abelian varieties by tori (including H_1 motivic thus provides an exten-
nontrivial sion weighing unit 2 by a weight pattern 1), but not vice versa. This may seem thin - yet I was
convinced myself more or less on the field - it was too attractive to be true! One reason more serious level
 l -adic representations from patterns on a K finitely, would be to prove that any extension of a module
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This discovery (just as "speculative" the "conjectural theory of motives") provided once the key
a shape defining **Hodge-Deligne structures** (also called "mixed Hodge structure") on the
body complex as transcription "on Hodge" structures "already known" about the reason and its
Hodge realization

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Technically speaking, the influence of my ideas in the definition of the Hodge-Deligne structures is
p. 793

double. On the one hand, via the concept of weight of a pattern, properly specified by Deligne in a structure
of " **filtration** by weight". Moreover, since the fifties, I emphasized the importance
the **De Rham cohomology** algebra of a smooth algebraic variety X , not necessarily own,
as a richer invariant than the cohomology naive Hodge (direct sum of $H_q(X, \Omega_p)$), which is
connected to the first by the well-known spectral sequence associated with a canonical filtration (**filtration by**
Rham) of the De Rham cohomology. I was the first to define the cohomology of algebraic De Rham (in
a time when no one would have thought to look at the overall hypercohomology an operator complex
differentials, such as the De Rham complex), and to emphasize its graded structure **filtered** , in contrast to the
bigraded structure of the cohomology of Hodge, who since Hodge was at the front of the stage. In the
If X clean (so that where one has the Hodge theory, implying that the previous spectral sequence
degenerates into a car. zero), and the main body C , is recovered bigraded structure on cohomology From
Rham filtered from its structure, taking the "intersection" of this filtration and filtration of the complex
conjugate (via the "real structure" of De Rham cohomology isomorphic to the cohomology Betti
 $H^*(X, C)$). I proved later (when nobody except me still believed in the cohomology From
Rham in the non-clean case), as a scheme X smooth over the field of complex cohomology
De Rham (which makes sense "purely algebraic") is canonically isomorphic to the cohomology Betti
complex (defined by transcendental channel).

That said, once postulated the existence of a concept of reason (not necessarily semisimple) and C
a motivic cohomology of a C -scheme X (not necessarily own, of course), and a concept of "rea-
lisation Hodge "(suitable and find) a pattern on C , which (according to my ideas) was associated with the
motivic cohomology X smooth a "generalized Hodge structure" (to be defined), having as a whole
base the De Rham cohomology $H_{R \& D}(X)$, the first structures you read on the latter, namely
filtration Rham (made by me from the fifties) and filtering by weight (introduced
by Deligne from my ideas about virtual weight, adding the ideas of Serre themselves from the
Weil conjectures), it falls exactly on the concept of "mixed Hodge structure" introduced by
Line.

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Of course, this filiation of ideas (164 1) was well known Deligne. It would have been consistent with p. 794

professional ethics (which I was not able to transmit) it makes clear in his work where he introduced Hodge structures mixed 338 (*). He preferred to ignore in this work, which is also **his thesis** , as he saw fit, on this particular occasion, to ignore also the name of one who had been his master.

5. In the annotated bibliography on the grounds (attached to its letter of 25 August), states that Deligne "One reason why we [!] hesitated to build on [on the few" classics " 339 (**) weight Galois i by another weight j is trivial if $i < j$. I do not remember if Deligne or I have demonstrated this statement, which would prove the existence of a canonical filtration "by increasing weights" for the l -adic Galois Module associated with a pattern (already pretty close object pattern itself...).

338 (*) This is the article "Theory of Hodge It" (Pub. Math. IHES 40 (1971) pp. 5-58). By cons, Greenhouse and I mentioned in the same line in the ad "Hodge I" at the Nice Congress (in 1970), as I point out in the note "Victim" (n ° 78 @page 308). See, for comments on this, the subscores n ° 78 1 , 78 2 to the latter.

339 (**) These are some sporadic texts ("classic") on the grounds, by Kleiman, Manin, Demazure published until 646

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on the grounds] is the use that is made of the existence of algebraic cycles conjecture - conjecture for which we have no real evidence, while the patterns themselves are unmistakable for me. "

I will answer this explanation that these "classics" are by no means representative of the "state of art "in the late sixties, it takes the same lot, and it **not** on the texts that he, Deligne learned this "state of the art"! He knows that my "standard conjectures" were a possible approach, among many others, for a temporary "shaped construction" of a concept pattern (semi-way) on a body, which limited the scope in any way and the internal dynamics of the ideas he had from me. (See in this regard the subnote n ° 51 1 of the note "Memory of a dream - or the birth of reasons" n ° 51.) Making of a two-stone blows, he strove after my departure, both to discredit the standard conjectures as "unaffordable" and uninteresting, and discredit a certain approach patterns that would have been mine and would have represented a dead end, inseparably connected it would have been (to hear) these conjectures without hope - so much so that he was more charitable to me in the LN volume 900 where we finally did the job he was really do, spend my name

0 modestly silent. . . 340 (*)

p. 795

6. In the same "annotated bibliography" I read:

"From this point of view" classic " 341 (**) there is a regrettable gap in the literature: your des-conjectural scription of tannakienne \otimes -category of motives over F_p , single equivalence nonunique isomorphism - with these various fibers functor (crystalline and l -adic), cf. Tate, isogenic classes of abelian varieties over finite fields, Sem. Bourbaki 352 (1968). "

These are crocodile tears over a "regrettable gap" which is due to no other (except me ...) that my friend Pierre Deligne himself, seen that besides me, he would be the only mathematician in the world who was aware of the "conjectural description" in question ... It was up to him to include it in LN 900 the same, for good measure! This description was also nothing conjectural, provided I remember now, except that it had to assume that we have a category called "patterning F_p @satisfying some reasonable conditions, one would expect of a class meeting this name. If I remember correctly, the reference cited Tate-Honda meant that the category in question was multiplicatively generated by the pattern of Tate (and its inverse) and abelian varieties defined on F_p . There were beautiful things (and I many passes), I had entrusted in the hands of my brilliant former student and remained carefully buried until today. . .

II spreads cohomology ("APG 4 1/2" APG 5, SGA 7, Riemann-Roch discrete).

1. One of the first comments made me Deligne about

0 the Burial I relates the vicissitudes p. 796 the conjectural theorem I had cleared in SGA 5, as the "theorem Riemann-Roch discreet."

I speak at some length about it in the sub-grade n ° 87 1 to the note "The Massacre" (n ° 1970. They hardly go beyond the basic idea of motive, and can not give any idea of the delicacy of "yoga" I had developed, and I had tried to communicate to anyone who would listen. Notably, there is no mention of the group motivic Galois, although it had been an essential initial motivation to develop yoga. (See note "Remembrance a dream - or birth reasons, n ° 51.)

340 (*) Deligne took the lead on any question I could ask him about it, from the first day of his stay with me, telling me with his best smile: "Do you really think that everyone does not already know that it is you who

have introduced the reasons ". The amazing thing indeed, is that despite all that my friend could do to forget I found that it is nevertheless still generally known. But for lack of written references for my ideas, Deligne was free to create the impression that my contribution had to be limited, as usual, to offer a vague idea General (also unusable as such, given its dependence conjecture "as unaffordable today they were the never "...) - even if vague, it does not really deserve a serious mathematician, doing real work, take the trouble to make only one reference pure form. . .

341 (**) See the penultimate note b. p.

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87). Deligne precise me that when notified MacPherson my conjectural statement, he considered as having a role of "factor" intermediate. He did not add to my statement a new ingredient - the idea of translating my statement in homological language to make sense for singular spaces, is due to MacPherson, not Deligne. He said he was surprised by receiving the print of the Mac Article Pherson proving my guess in the analytical-complex cases and in the context homology (by arguments transcendent), to find the guess by the name of "conjecture of Deligne-Grothendieck". He had thought to write MacPherson to rectify the misunderstanding, but (he would himself have said why) he did finally not. . .

2. Contrary to what I assumed, and I suggested, Deligne had not made a commitment to upon oral seminar SGA 5, write one or more presentations of the seminar, such as exposed the cohomology class associated with an algebraic cycle (he ended up writing eleven years after the seminar for inclusion in the volume of his composition called "SGA 4 1

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"Without further ado ³⁴² (*)).

Incidentally, I asked if he did not think the privilege of being able to learn "on the fly" in SGA 5, the basic techniques that served him throughout his later work, did not require him **obligation** or responsibility to do everything possible to these techniques are made available mathematical public, rapid publication of SGA 5. Deligne replied **I thought not** .

I refrained from asking him the same question about the philosophy of the grounds, which was his main inspiration for the cohomology of algebraic varieties (which is the central theme of his artwork. . .).

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3. It is Deligne who took the initiative to ask Verdier agreed to include in "SGA 4 1

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" the
p. 797

famous "State 0" Verdier work on derived categories. Verdier had initially objected, saying it would be meaningless (I do not remember the exact phrase). This is Illusie who eventually convinced Verdier to agree. The first reaction Verdier seems more natural and consistent with simple common mathematical sense. Moreover, Verdier had for years decided to bury the derived categories, under the as a "work room" wingspan, which was a day supposed to be his thesis - it would therefore have a zany air published a preliminary sketch, long ago, was widely covered by the literature. I understand why Deligne and Illusie held so publication

0 of that State, where my name was not mentioned. As for the reasons of Verdier to return to his first common sense reaction, I increased the feel and express myself on this in the note "credit and insurance all Thesis risks "(n ° 81). 4. In the note "The clean slate "(n ° 67), I noted the ambiguity of the phrase" this semi-nary "in the passage of the Introduction to SGA4 1

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where it says (p 2.): "For the application functions L,

This seminar contains another demonstration, it complements, in the particular case of the morphism Frobenius. "This ambiguous term, given the context and spirit, had any chance of being read to mean

"APG 4 1

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"So to suggest that the mother seminar SGA 5 did not contain a demonstration" complete "rationality functions L. Deligne me clear that in his mind, "the seminar" wanted to say "SGA 5". Actually, this clarification does not specify anything for me. I know Deligne knows as well as me in SGA 5 there is a demonstration "complete", but yes, a trace formula, which overflows

342 (*) This act of dismantling (among many others) the seminar SGA 5 in favor of the volume called "SGA 4 1

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two functions, from one and the other in the direction of a "reversal" of roles me to pass as "collaborator" of Deligne and substantiate the claim of precedence (already suggested by the misleading name SGA 4 1

2 , and explained "between the lines" in

introducing both SGA 4 1

2 by Deligne, that SGA by Illusie 5) of "APG 4 1

2 "on SGA 5 (where references GAS 4 1

2 , via

said hacked exposed SGA 5, abound). See also about the comments in the note "Reversal" (n ° 68 © where I finally discovered the meaning of the strange name given to the volume-pirate, and the presence in this volume of my presentation on cycles

Algebraic.

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also by far (contrary to what the name suggests) "the particular case of morphism Frobenius. "But it is not by chance that the pen Deligne abound vagueness and ambiguities, when it is not even against patent-truths, which all point in the same direction: to suggest an impression, about my work or that of Mebkhout and others related to my person, likely to discredit, while enhancing its own credit, or creating from scratch 343 (*).

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5. I take this opportunity to add a few comments about SGA 7 II (seminar presented p. 798 as directed by P. Deligne and N. Katz), on which I was already expressed myself at some length in Note (unnamed 344 (*)) n ° 56. A review some more detailed showed me that on this occasion, N. Katz is not private to quietly push the wheels of the van Funeral smoothly conducted by Deligne, and this in many ways.

Katz agreed to appear with Deligne as co-author of the volume and the seminar, which corresponds not to the reality of what had happened during the oral seminar, four years before the publication of the volume. The overall design of the LMS 7 seminar (which continued over the two years from 1967 to 1969) had I, and the seminar was presented as a seminar led jointly by Deligne and me. N. Katz is listed as a collaborator-speaker among a number of others. But the moment N.

Katz agreed to sign as co-author of the volume (including five papers are written by him, but none the main results is due to him), it is normal to consider it jointly responsible, alongside Deligne, general holding volume, and the retraction that is done of me.

I think first of all to the retraction made in the introduction to the volume (signed by Deligne), where nothing to suggest that I have something to do with any themes or results presented in the text, while one of the two "Key Results" seminar featured (ie, the theory of Lefschetz pencils) Was developed by me even before the seminar SGA 7, and had also been one of my motivations to consider doing a seminar on the theme of the monodromy. In the stated Katz having this theory (Exp. XVIII), named "Study of cohomological Lefschetz pencils, by N. Katz," my name not appear in the title as is customary ("after A. Grothendieck"), but is in a terse notes footer after the name of N. Katz, "According to notes (brief) of GROTHENDIECK". looks that the "brief" qualifier was added to minimize the fact that these misguided "notes Grothendieck "have played a role here. They were beautiful yet be" succinct ", they nevertheless represented less the culmination of a several days on the job, not obvious a priori, to transcribe in technically an entirely different context, statements and results demonstrated by transcendental way.

As the duality or spreads

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Nielsen-Wecken theory 345 (*), the classical arguments were p. 799

as is unusable, and had to redo everything, taking the **results** classics like a thread and completely forgetting their "demonstration" (if you can call it that) traditional. It is normal, even helped by my circumstantial notes, Katz had to make an effort to get into the bath, as I have done before him - but this does not mean (at least, not according to the rules generally admitted) whether the author of the Lefschetz theory brushes in étale!

Continuing its momentum in the introduction to the same presentation (p. 225), Katz pretends to introduce Ms. 343 (*) In particular suggesting his paternity on the main ideas of the reasons that the étale, and that of the "theorem of God "and the philosophy that goes with Mebkhout.

(March 26) for the case and "seminar", see also the sub-note "Double-sense- or the art of the scam" (n ° 169 7).

344 (*) (March 26) Meanwhile, I filled this gap, including this note in the table of contents as "Prelude to a massacre".

345 (*) Having less restraint than his friend N. Katz, Deligne had not seen fit to also mention that I was for some thing in what he called "the method of Nielsen-Wecken" - see about the sub-grade n ° 67 1 to the note "The clean slate" n ° 67.

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Raynaud as the author of structure theorem moderate basic group "first to p" of a curve algebraic coach. p. If I remember correctly, that theorem (demonstrated by me in 1958, before even met my future student) who, with the "cow Lefschetz theorem" is the ingredient deep technical theory, and I was all happy, in the proof of irreducibility theorem, having to use full force.

In the introduction to the exposed XXI Katz (p. 364-365), after describing the main theorem of the former posed, concerning complete intersections in projective space, it says:

"There heuristic arguments due to A. Grothendieck and based on the yoga co-crystalline homology, that make plausible the general statement for all X smooth projective by essentially the same method. "

This comment suggests that I would be inspired by the text method (due to an unspecified author, which can hardly be that one of the two authors of the volume), to embroider above "heuristic arguments" that can generalize the result proved. I seem to remember that it is just the opposite - that are my "heuristic arguments" (which I had developed in my corner before the seminar, following my reflection on the Griffiths theorem and the Lefschetz pencils 346 (**)), which are "walk" 0

(Without ingredients conjectural what is more) if X is a complete intersection. Moreover, in p. 800

the previous presentation (Katz also) dedicated to said theorem Griffiths, it is said in the introduction that " **The demonstration given here** (due to GROTHENDIECK) is the translation in purely algebraic terms the original demonstration, more or less transcendent, of GRIFFITHS ". This comment can give the impression that we are spoiled for choice between several demonstrations Griffiths theorem coach. any, and that did me the honor of choosing my own. In fact, there are none else provided I know. Also from the work that I had been forced to stuff, I doubt that this demonstration is a simple "translation" of the Griffiths, nor demonstrate any of the great theorems Key in étale was the "translation" of an already known demonstration, or (for that matter) that control the étale schemes was a matter of "translating purely algebraic terms" the familiar theory ordinary cohomology.

I have reviewed **the** three references to my person in the explanatory texts of N. Katz (there is a one in all eight presentations Deligne!). They seem to me to reflect all three of the same deliberate. Finally, I note that in the text of the final presentation of the volume, by N. Katz, devoted created the "mod congruence formula. p" of a function L bus. p, my name does not appear 347 (*) - not even for the ordinary cohomological expression of the function L. In fact, similar expression in terms of co-crystalline homology (that remained speculative), led me to conjecture since the congruence of formula several years. I communicated this conjecture Deligne, who had found a demonstration astonishingly simple, thanks to its formula Künneth symmetrical (exposed in SGA 4 XVII 5.4.21). I suppose Katz, who was perfect in the shot of this stuff, knew him as the source of conjecture, without judging the worth mentioning. (He presents the text in a different demo that of Deligne, and much less elegant.)

346 (**) It is these reflections, as well as my thoughts on the theory of vanishing cycles in geometry abstract algebraic (another of my "purely algebraic translations of transcendent theory"!) that were originally AMS 7 seminar.

347 (*) It is not entirely accurate - it appears there (so it is a fourth reference to my person) in a breath with Deligne on page 410, to thank us for having explained to author various equivalent reformulations of the form in which it This matching of formula. Comically, three numbered references indicate that for these brilliant variations, none exists in the presentation, so these are thanks figure amiable hoax! (This is not the first I encounter in the Burial. . .)

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Comically at the end of the introduction of this ultimate presentation SGA II 7, we read that the demonstration Deligne "should be included in the reissue of SGA 5" (SGA 5 which had not yet had a chance yet to know his

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first edition"). This may suggest that five years before the operation SGA4 1

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- SGA p. 801

5, Deligne still intended (as it was normal) to include in future published version SGA 5 supplements he had made since 1966 to the theory of étale developed in APG 4, SG4 5 348 (*).

III Philosophy Mebkhout (Symposium Luminy June 1981 article on "beams per-to "Beilinson, Bernstein, Deligne).

I repeat here for the record that I reported on this in the previous note.

1. Deligne said he had learned "theorem of God" ³⁴⁹ (**) in conversation with Mebkhout Bourbaki at a seminar - it was in any event before the summer of 1980. This overlaps with what I would like to Mebkhout, that the theorem in question had been communicated by Deligne to Beilinson and Bernstein in October 1980, soon to be used by them in their demonstration of the conjecture Kazhdan-Lusztig ³⁵⁰ (***) . Deligne added that he had not mentioned in his article Mebkhout with Bernstein and Beilinson, not being sure what was the share due to Kashiwara in this theorem ³⁵¹ (****).

2. Deligne does not dispute that the Symposium of June 1981 Luminy (which itself appeared as the great Featured) would not have happened without the work of Mebkhout in previous years. He only held adding that the role McPherson ideas seemed "more important". He did not suggest that there would be something strange or unusual that the name of Mebkhout not in the Proceedings of the Symposium.

IV Formalism duality in cohomology, derived categories ("The good reference," "State 0 "derived categories).

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1. Deligne says that he is not aware of Article Verdier ³⁵² (*), taking on his own (between p. 802 others, without naming me) formalism of homology and cohomology classes associated with a cycle (I had developed in SGA 5 in 1965/66) that **close** the publication of SGA 4 ¹

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in 1977, so a year

at least after the publication of the article in question. This seems to contradict the impression that I had had, the brilliant operation made by Verdier in 1976 was a kind of "trial balloon" for operation considerably larger Deligne and others, which followed the year after.

Deligne told me it was clear to him, crossing the article Verdier, that it was not exposing some of the ideas I had developed in SGA 5. He was still happy that Verdier is finally loaded to provide a reference. (The idea that the publication of SGA 5 would have provided perhaps a reference more adequate does not have the touch. . .) To a question from me in that sense, Deligne said he had ³⁴⁸ (*) I presume it is the absence of any reaction (any of the people who were in it) to escamotages which are made in SGA 7, which must have encouraged Deligne to the next step in his climb: the large-scale scam the SGA 4 operation ¹

2 - 5 SGA.

³⁴⁹ (**) See footnote "The unknown service and the theorem of God", n ° 48.

³⁵⁰ (***) See footnote on page 28 May in note "The Iniquity - or meaning of a return" (n ° 75), and also the note "A sense of injustice and helplessness "(n ° 44").

³⁵¹ (****) View comments on this in the previous note "The accomplishment - or the moment of truth", especially p. 784 and footnote page about "Kashiwara."

³⁵² (*) This is the article cited in note "The good references" (this was definitely the name that was needed!), N ° 82. (May 12) To comment on this hardly believable version of Deligne, see note "Glory galore - or ambitions guous "(n ° 170 (ii)), pages 930.931.

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not noticed that my name did not appear in the article Verdier - adding that he admitted he had not thought even to ask the question. I felt it was heard, tacitly, that these things was the last of these concerns and does not deserve some attention. . .

2. In Article (repeatedly cited in the Burial I) Beilinson, Bernstein, Deligne, written by Deligne care and presented by him to the Symposium Luminy ³⁵³ (**), the duality in étale (I had developed in 1963) is called "Verdier duality" ³⁵⁴ (***) .

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I questioned Deligne this strange name. He replied (with a peak of embarrassment this time) p. 803

it was because "everyone" was called like that. I have not asked him to tell me who this "Everyone", or how it was a reason, while he, Deligne, perfectly knew that this was due theory.

This reminds me of one thing that struck me long ago. Speaking with me at least, or by writing to me, Deligne never used the term "derived category" without adding "Verdier". it made me an uneasy feeling every time, without my ever stops me (before the discovery of the Burial) to probe the meaning, let alone to put the dot the i. I should have probably stopped if I had bothered to take a look so slightly curious about "SGA4 ¹

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"And on" State 0 "from the" thesis "

Verdier who finds unearthed there. (For details on the latter, see II 3 above.)

V Praise Funeral

1. The Jubilee plate of IHES where my praise of Death ³⁵⁵ (*) was not composed by its founder and first director, Léon Motchane (as it seemed to me). Regardless of the way, here © identity the author of the wafer, that Deligne taught me. He confirmed that it was he who wrote the passage me about, and that this passage, like the one concerning him Deligne (payable to the author of the plate), has received the "green light" before being sent to the printer. The text he had dedicated myself was initially more long, and was (with his consent) truncated by the author of the wafer. Deligne was also reviewed and corrected the text concerning himself. These texts therefore represent well the views of Deligne concerning his work and mine.

2. I asked Deligne if I was wrong, assuming that in any of its publications, he has hinted that he could learn something

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through my mouth. He confirmed it with one
p. 804

Reserve. It concerns the biography he had written for the National Research Fund Scientist (Brussels), on the occasion of the award of "Five Year Award". This prize was awarded (in 1974 I think) as a reward for his proof of the Weil conjectures. It is true (he said) that

353 (**) See, on this "memorable Symposium" and the article in question, the note "The Iniquity - or the sense of a return," n ° 75.

354 (***) This was done in several movements. At my suggestion, Verdier had developed a theory after 1963 duality "six operations" in the context of ordinary topological spaces, following the supervisor that I had developed the coherent algebraic context and spreads. This duality was baptized by my cohomologists students, as it should, "Verdier duality" or "Poincaré-Verdier", without mention of my modest person. In the "good reference" 1976

Verdier takes other hand, in the analytic context and without naming me, part of the formalism that I had developed in the coherent framework in the fifties (without having nothing to change). So this duality in the analytical framework, takes the name yet "Verdier duality", or sometimes "Serre-Verdier", still no mention of me - even

Mebkhout follows the general movement! But (by a stroke in great trip) it is clear that the algebraic coherent duality is only a "purely algebraic translation" of transcendental analytic theory as well as the spread is a duality

such "translation" to the transcendent topological theory. It was therefore necessary, therefore, to baptize also "duality Verdier" (Serre and Poincare being forgotten for the occasion, as they are below). From what Deligne told me is really what that "everybody" was quick to do. Curtain. . .

355 (*) See the two notes, "In Praise of Death (1) - or compliments" and "In Praise of Death (2) - or force, and the halo", n ° s 104
105.

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18.3. The last rites (or visit)

this biography is not in a mathematical publication and dissemination remained more limited. For my part, I did not know existed. At my request, he made me reach a photocopy in the days that followed, and I think back to this notice in the following note.

The systematic denial of my person that confirmed me Deligne did not seem to bother him. he did not seem to find there anything strange, worth some attention. Given these provisions, I am not felt prompted to ask him any question in this regard - I do not think I would have drawn nothing more.

To conclude this retrospective, I just add that to everything related to the "material facts"

in the strict sense, I have no doubt about the good faith Deligne, which struck me as obvious ³⁵⁶ (**). The only exception to this is his assertion that the seminar SGA 5 (from 1965-1966) logically depend on

results SGA 4 ₁

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357 (*) (developed in 1973, alongside the exposed Deligne on its demonstration

Weil conjectures). It is true that "capturing" some of the presentations of the seminar SGA mother-5 (and especially the one on the cohomology class associated with a cycle), with the connivance of Illusie (who was responsible publishing SGA 5) and many others, he got this brilliant result that SGA 5 is peppered with references

GAS 4 ₁

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So as to give the impression (to a reader who is very attentive, and very good in it)

that SGA 5 depends indeed SGA 4 ₁

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Which appears in all respects as a "prior" text. It is there sleight ride probably unique in the history of our science, and that seems distinguish seventy years of this century among all other times mathematics has known.

Rating 164 ₁

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Concerning the "philosophy of weight," end of the Weil conjectures, the "descent" seems p. 805 be summarized as follows.

a) As stated in the sub-grade n ° 46 ₉ of the note "My orphans," Serre had contacted me, as

part of the "philosophy" behind the Weil conjectures, a sort of "yoga for weight **virtual** " at the l-adic cohomology of finite type pattern on a body. He had not tried to give a formulation explicitly states, and the relationship between what was happening for the individual remained entirely mysterious.

b) One of the two main reasons that guided me from the beginning of the sixties, to develop a "yoga of reasons", was precisely to link the "virtual weight structures" for s different. (See the note about "Memories of a dream - or the birth of reasons" (n ° 46), and more particularly p. 208.) Therefore, it became clear that this structure had to be on all the "achievements" possible of a pattern, not only the achievements -adic - including (on the main body C) on the realization of De Rham-Hodge.

c) When informed by me of this philosophy virtual weight, whose ultimate source is the motive, Deligne Yoga brings to this great accuracy, with the presumption that the virtual weight structure on a pattern is linked to a **filter** (necessarily canonical) **by increasing weights** . This at from filtration should find out all the achievements of the reason - both the achievements -adic that (over the field C) of the De Rham-Hodge.

This "presumption" Deligne was the starting point of his theory of Hodge structures "mixed" (that I call "Hodge-Deligne structures"), and one of the two essential ingredients of technical definition 356 (**) (May 12) Looking back are nevertheless appeared certain reservations about this impression, like those to which refers a previous note b. p. (*) P. 802). It appeared also that Deligne had failed to note for me two coarse material errors in my notes, which have hardly gone unnoticed by him. (He had escaped that reveals part of the "yoga of weight" in Hodge I in 1970, and had spoken of the grounds in 1979).

357 (*) It is true that this statement came not by the spontaneous initiative from Deligne bring me "information material "to enlighten me and to burst its absolute good faith, but under unexpected pressure need to" save face " while I had to express in person my feelings about the incredible operation SGA 4 1

2 - 5. Ensure SGA

about the last part (February 18) of the previous note "The accomplishment - or the moment of truth."

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shaped them (the other being the filtration Rham, which I had brought from the fifties).

It is the success of his attempt to describe a "cohomology Hodge" for separate schemes finitely any C, which can be considered the main (if not only) "evidence" we have to present on the validity of the "presumption" of the existence of a filtration weights on the grounds. Of course, it was part of my great work program around the grounds, which was Deligne informed first hand and from day to day, to explain a concept of "coefficients Hodge" on a diagram of finite type over C, so that a pattern on an X match "Hodge realization" and that for smooth and clean patterns on X (e.g., those from

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a clean and smooth scheme X taking

p. 806

his "motivic cohomology X dimension i"), there is the notion (more or less already known) of "Families of Hodge structures" (including studied by Griffiths in the sixties). In addition, for X variable, the categories of "coefficients Hodge" had to meet a formalism of the six operations reflecting the same formalism at the grounds - the contribution of Deligne is a first step To the accomplishment of the program - knowledge (essentially) a description of the category Hdg (X) X reduces to a point 358 (*), and that the functor "realization" ie, essentially the construction of a cohomology theory on C-scheme finitely separated, with values in this category structures Hodge-Deligne.

18.4. The Skeleton Dance

18.4.1. (1) for a skeleton wave Requiem

Rating 165 (22 February) since his visit last October, and even already from its letters of late August 359 (**)

My friend Peter is with me ex-pupils cream and good boys, filled visibly good touching desire to dispel the unfortunate misunderstandings that have crept us, and for me take its good intentions and good faith. It was understood that it would hold confidential until Pre-publication provided Crops and Seeds by my university care (the USTL), the content of readings it made my notes, and even their existence. I do not know whether he has fully kept his word - always is it that I have a feeling by various echoes that came to my 360 (***) that he has had to have a word at one and the other, to suggest that it might be time to give some consideration signs the master (the one he happens to talk in small groups, but we carefully refrains to appoint public. . .).

358 (*) Ideally, it would complete the definition of Deligne by introducing a category **triangulated** suitable Hdg * (Is also the category derived from Hdg?). That he failed to do so seems to me one of the first signs (among others subsequent) of the alienation overlooked yoga derived categories and six operations which lasted until "turn of Pervert Symposium "in 1981.

359 (**) See footnote "The accomplishment - or the moment of truth" (n ° 163), where I "is" this visit, and the two letters end of August (received after the silence of nearly two months, had followed my sending the introduction and table of contents Burial).

360 (***) So, I received a preprint of Illusie, undated (I guess he must be last minute), a presentation of a seminar not appointed (corresponding statement does, is it clear, in no oral presentation of the seminar). In the title, unbelievable but true thing,

My name is yes: "Distortions of Darsotti-Tate groups, according to A. Grothendieck", by Luc Illusie! And in the introduction there is still the "Grothendieck" long as your arm - I grew dream. Certainly something must have happened. . . There was a letter in which he asks me my lights on homotopic algebra Grothendieck point style, wonders why "people (ie Quillen et al.)" K-theory work with beams rather than complex (Pseudocoherents or perfect) in the range that I had introduced there over twenty years. One wonders indeed why. . . In my reply, I had to suggest that it was not in it, nor any to my former students ask me such questions. I have been more sign of life from him since.

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18.4. The Skeleton Dance

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I feel also that deep down, my friend does not believe (or want to believe, at least) that I will p. 807 publish indeed the burial, along with the first part of Crops and Seeds. This is conformed to the image of the "sugar daddy" qualms doing is to appoint someone who might have the penalty, and quite willing to acknowledge in public the various shortcomings of his own grown that come in mind. Reading this part "Fatuité and Renewal", which I had a brief echo before departure holiday my friend and before I send him an introduction to the Burial, did not care for a penny, quite the contrary - she would rather stimulated self satisfaction of air that became me well familiar home - this air condescending suspicion or at least with respect to the protective decidedly deceased master. It©not at all the same thing with the Burial, which suddenly cards are put on the table altogether!

I suspect that reading the introduction had to shock him - and it is a pity that I was not present at that time, maybe something would have happened. Still, he was given time to regroup before coming to see me, breezed five minutes before moving to the United State. And he came running with such good provisions, and the meeting took place in such a family atmosphere, so "cake", it sounds eliminate, so to speak "by contradiction" that said sugar daddy can itself even take seriously a text that does not look like him (do not say more about this text, best forgotten. . .), Or even distribute it among people just as reasonable and "good" in all reports that my friend Peter himself and the former deceased as he has always known. . . 361 (*).

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As he had promised, and the same days that followed his return to Bures, my friend made me p. 808 mail this biography he told me, he had written in 1974 (or 1975) for the Fund National Center for Scientific Research (Belgium) 362 (*). This is a short text, two small pages, I then read with interest and I just re-read at the time (this is the third reading, I think). At first glance, I did not feel, however, that this text anything new, and that he deserved me to dwell in the Burial. It is true that the retraction technique, which was already sufficiently known to me at my friend, is shown here in a particularly striking way, a compact one hundred text lines. My name appears four times (like that of Serre, and that of Weil three times) - without nothing can imply that I may have met otherwise than as anonymous listener My seminar (on an unspecified topic) in 1965-66. In three of the four passages where I mentioned, I am in a breath with another mathematician (Serre twice, once Rankin), so as to avoid giving the impression that I could play with him a role so little particular. This is also a technique which had already been proven elsewhere 363 (**). As it will not be long, I would like here to quote verbatim the three passages where my modest person appears to enlighten the reader who does not have, like me, the text of the biography.

The third paragraph goes on with the mention (which just made) for the year 1965-66 increased "in the at-ideal phere of the Ecole Normale Supérieure as a foreign resident " 364 (***):

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"In Paris, I followed the seminar Grothendieck and during JP Serre. Three hours of classes p. 809

361 (*) However, there was no time for hesitation my intention to make public all my notes on the Burial, as well as the first part of Crops and Seeds; and I have, of course, left no ambiguity about it.

362 (*) This biography is mentioned for the first time in the last footnote page to the note "The nerve in the nerve - or the dwarf and the giant "(n ° 148) See also the end of the previous footnote. ° 164 (Part V 2).

363 (**) I think here the terse reference to a line, citing a Serre breath (without naming him) and "conjectural theory Grothendieck motives "in the ad (the Congress of Nice) by Deligne in its results in theory Hodge. For clarifications and comments, see sub-grade n ° 78 1 of the note "Victim" (n ° 78 ©

364 (***) For some reason that escapes me, Henri Cartan is not named here. Perhaps it is because Deligne, encouraged by a
some deliberate in me against him (see note "Being apart", n ° 67 ④) wanted to carefully avoid any appearance
he could be someone the student. The situation of "Normale" immediately arouses the association of ideas "student Cartan",
and
Such an association would have been strengthened by mentioning namely Cartan.
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week but despite a happy and hard work, the rest of the week was enough to
only assimilate (165 1). Grothendieck, I learned modern geometry technology
algebraic, Serre, the fascinating beauty of the theory of numbers (165 2). Courses Serre
were devoted to the theory of elliptic curves, which intersect ... "
to continue on the charm and variety of these courses Serre. The player not in the know will think
it is these courses, with three per week, which were the subject of "working hard and happy," which
says the author (meaning: no need to work to assimilate the "greatest natural generalities"
a Grothendieck seminar. . . 165 1).

In the fifth paragraph, about his proof of the Weil conjectures, it reads:

"My most notable achievement is to have shown the" Weil conjectures "(...). I ④ not
probably come to be familiar with both the work of Grothendieck with in a different
field, the work of Rankin on modular forms. "

We admire the "probably" doubtful (masterfully placed there!) And "in any other field" (suggested
manager that my work has nothing to do with modular forms 365 (*)), and especially "as with" by
which I have the honor to be introduced to put on the same footing the vast work foundations that I had
made 366 (**), with a technical idea "point" borrowed from Rankin.

Finally, in the following paragraph referring to the work of Deligne on Hodge theory, it is said:

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"Inspired by the arithmetic, particularly by Grothendieck had design

p. 810

deep sense of Weil conjectures, I generalized (non trivially) his theory to the case of
arbitrary varieties (with Sullivan) to other invariants of the "form" that
only cohomology. The root of this theory is old already, with Picard treaty
"Algebraic functions of two independent variables" (1890), but we do know without
little doubt now but a vague skeleton. "

It took me to take the trouble to copy this passage, only to realize that "the design had
Grothendieck deep sense of Weil conjectures "was how masterfully" inch "for my
brilliant former student not to appoint the **grounds** without one can blame him for having gone
silent! No doubt that "his [so I] theory," which I do wonder at the instant (everything
passage had escaped my attention in previous readings) can only mean the famous theory
reasons, he was not about to mention by name for four years now (and do not evoke
over eight years again!). The formulation was even such vague points and frankly, incomprehensible
except for a small handful of people in the shot (which probably will not have had the opportunity, like me since,
reading this pre-Praise of Death), he did not even bother to stress here that this "theory" (he had
generalized) was, however, any conjecture! The "generalization" in question can hardly describe the
Deligne-Hodge theory, given the context. This is a small symbolic satisfaction that my friend is paid in
claiming here (without fear of ever being contradicted, saw the place, and the elusive wave of the formulation) that the theory

365 (*) It is true that the "modular forms" represent a regrettable hole (among others) to my mathematics,
as the analytic number theory, which I have never "hung". But I ④ still sufficient
ciently informed to know that understanding of modular forms is hardly thinkable without the ideas from the
algebraic geometry, which gives the theory its contents "geometric" and that the most profound questions of theory
modular forms are closely related to the presence (long implied) of **grounds** . As we shall see, these
included elsewhere, just as tacitly, in the next paragraph of the biography (aka Funeral Eulogy (3)!).

366 (***) On the schema concept and development of a cohomology formalism spreads, what Deligne care not to
hint, if not in the above quotation by the amiable and impersonal euphemism "modern geometry technology
algebraic ".

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18.4. The Skeleton Dance

Hodge-Deligne (which is still in its infancy) "generalize" the vast array of reasons I
had shown him. In it, however, a "Hodge theory" reached full maturity, figure as a
the "planes" of the table among many other 367 (*) As for "other invariants of the form", I was
"Well known" since the sixties (as part of my "yoga of reasons") that algebraic varieties

"Arbitrary" (as stresses Deligne) had a "homotopy type Motivic", the π_i above ($i \geq 2$) generalize the fundamental group "geometric" Motivic, and explicit (for a given fiber functor over a number field K) as algebraic pro-affine K .

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As for the reference to Picard as "root of this theory," that is, to me it seems an entirely passing p. 811 ment can, introduced for the double reason to "do good" and to introduce simultaneously paragraph terminal immediately following 368 (*). The term "wave skeleton" also seems the expression of another "Symbolic satisfaction" that my friend will pay, treating in his heart and yet without seeming (Always in the same style "thumb") this broad vision he was inspired secretly while still buried 369 (**), as not being altogether a "wave skeleton".

Eventually these escamotages to all comers were more interesting than I anticipated when I was about to point out in passing, for conscience. What most strikes me, now, it is not not (as in the first reading, quick and superficial) perfect like "thumb", already known to satiety. It is rather that this text, written nine years before Eulogy Funeral 370 (***) foreshadows this way saissante, and this (I think) in two ways. On the one hand by the wave of rigor that must surround each appearance of my modest person (in contrast here with the luxury of technical details that accompany the evocation of the course of Serre). On the other hand, and in the same direction by the complete silence that is done around 0

the étale or -adic as new and essential tool that I developed from nothing, p. 812

and without which the Weil conjectures would probably not demonstrated even in a hundred years again!

In fact, as in Praise of Death, the word "cohomology" is not pronounced in relation to my name - not more than is alluded to the fact that the proof of Deligne conjectures of Weil was simply **the last step** of a long journey, with the longest and also the most innovative was accomplished by a but him, even before my brilliant student appears on the mathematical scene 371 (*).

Rating 165 1

As I point out some lines later, the wording suggests that irresistibly

"Three hours per week" mean "during JP Serre" he just mentioned, and he

will issue another two sentences later. In fact, Serre only gave one course a year (in College France) at a rate of one hour per week. If we try to remove the ambiguity in interpreting the text as 367 (*) (February 27) For details on this, see especially note "The Sound tomb - or sufficiency" (n ° 167).

368 (*) This paragraph terminal will be the subject of the note (n ° 165) that follows this note.

369 (**) The vision of the reasons remained "buried" in two ways. On the one hand vis-à-vis **the outside**, the mathematical public, refraining from any reference to the concept of pattern (except the half-line "thumb" Hodge I, in 1970, see note 78 1) until 1982 when the concept was exhumed "in big bands" under the tacit paternity Deligne (see notes n ° 51 and following). But secondly, even for personal use, I see that this vision was stripped by Deligne whose real **breath** of making was **anything other** than a collection of recipes mat (to recognize it in the cohomology of algebraic varieties) but a **dream force** large enough and deep enough to provide inspiration, line on the horizon, for generations perhaps arithmeticians surveyors.

The term "wave skeleton" by which Deligne refers (always tacitly) to this vision, makes striking the provisions of **gravedigger** in which it holds, in its relation to the dream and the worker whose dream came. That are not the provisions where one can still feel a breath (as he had felt once) nor embody a dream. It does not embody a dream by **using it** for its own purposes (and while denying the...), but only if in **making the servant**.

370 (***) See the two notes, "In Praise of Death (1) - or compliments" and "In Praise of Death (2) - or force, and the halo", n ° s 104 105.

371 (*) The contribution of another is retracted by Deligne in impersonal terms such as "modern techniques [or, Moreover, "powerful tools"] algebraic geometry".

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Referring to the "course" Serre during successive years (contrary to what suggested contexe) we spotted another inconsistency because Serre changed theme each year, but not limited to the elliptic curves (as stated Yet two sentences later).

While the person Serre is used here by my friend to try to deceive about the role that was mine in the crucial years of his mathematical training, it is interesting to note that the single reference which I have knowledge in literature, where it is said that Deligne was my student, is from the pen of Serre, who repairs and (without raise) the glaring omission of the growth of my brilliant former student himself. This is the report by Serre in May 1977 about the work of Pierre Deligne for international the Committee to distribute the medals Fields 1978. This report was made public after the distribution of Fields medals at the Helsinki Congress 1978. The report begins with these words: "The first work of Deligne, directly inspired by Grothendieck which he was the pupil, concern various technical points of algebraic geometry. I merely mention. . . "

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Further, Greenhouse also mentions the influence of my ideas and results in the demonstration of conjectures

p. 813

Weil, and (through the grounds) in the work of Deligne on modular forms, but not in work Deligne-Mumford on the modular multiplicity algebraic type curves (g, v) nor in the idea of cohomology of Hodge-Deligne, whose relationship to yoga patterns and Weil conjectures it seems have escaped. (It is true that Deligne has done his best to hide it.)

The discourse on Deligne on the occasion of the award of the Fields Medal was another occasion following the established practice, to publicly remember the link to my person who had been previously by you the person concerned. For some reason that escapes me, the mathematician responsible for presenting the work of Deligne has not JP Serre, but N. Katz, "co-author" with Deligne SGA 7 II (see this footnote ◦ 164 (II 5)).

Needless to say N. Katz makes no reference to the link in question, although it was well known to him and first hand. (By cons, it repairs the way, no less, a number of omissions somewhat annoying the illustrious winner to me. . .)

Rating 165 2

The selection of qualifiers here ("modern techniques" for me "fascinating beauty" Serre) is certainly not the result of chance. I perceive clearly intends to evacuate my friend (sym boliquement) this **fascination** precisely that since our meeting (and maybe even before it) linked to the myself and my work, he saw happen and unfold before his eyes, day by day.

I have noticed on other occasions even a deliberate look at my friend and my present publications (including EGA ("Geometry of Algebraic Elements") and SGA ("Geometry Seminar Algebraic Bois-Marie ") as a kind of" compilations "of results more or less technical, as "Everyone" has always known, and for which I would do the commendable effort to put black on white, in order to finally provide the missing references and speak no more. He well knows, however, the background what to believe: that each volume of EGA and SGA have ideas that I introduced and which for years I was the sole owner and lawyer, and techniques that nobody had dreamed (except me) and it took me develop, test and refine with untiring patience before they are full-fledged, end ready to enter the field of "well known". He knows better than anyone, but at the same time, it appears that he deliberately

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for more than a decade has finally become a "second

p. 814

nature, "he himself became the first (if not the only) fooled.

I got hit there a few weeks ago, when my friend, thoughtfulness to me since his passage home in October, called me a copy of an exchange of letters with Dr. Heinze (in charge of "Ergebnisse der Mathematik" Springer) about a project Reedit EGA (many of 658

18.4. The Skeleton Dance

Volumes are exhausted or about to be) his response, Deligne unreservedly recommend republishing integral, "ne varietur" to pretty much, saying only one exception (the second part of EGA III where the presentation would have been better using the derived categories (sic)), this treaty "has aged very well." His great merit would be to provide the necessary references: "Thanks to it [EGA], in algebraic geometry (as Opposed to analytic geometry, for instance) one can march securely on the ground without HAVING to worry This or That is if Careers in the literature. "(He followed that with a number of constructive suggestions, about possible aprendices that could be added to certain volumes, and mathematicians would be able to provide them. . .)

It is typical of the Springer house relationship to myself, that this correspondence (about a reissue of books I am the author) continued **with Deligne** , and without that Springer has deemed necessary to first tell me about this project. This is more than a month later (in a letter dated 24.1) that Dr. Heinze speaks to me in passing, as a matter of conscience, of the thing - that Mr. Professor Deligne "was kind to give me a copy of his letter of 12/19/84 "(it was really nice...), and" of course, we [Springer] would be interested to hear your opinion about it [the reissue project] "(it really too much honor. . .). I replied that, given the processes in use in the Springer] in publishing (Thinking of publishing SGA SGA 7 and 5 in the Lecture Notes, not only notify me, let alone ask my permission), it seemed perfectly superfluous to inform the Springer Verlag "My opinion," clearly irrelevant. Things are there. . .

18.4.2. (2) The profession of faith - true or false in

Rating 166 (February 23) Finally, I am not come to my true about yesterday, speaking of the biography of my friend Peter. The meeting "skeleton wave" (aka, patterns theory) was a unexpected episode, when I was already getting ready to continue with the final paragraph of the notice, sui

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efore p. 815

Immediately the last passage quoted. Here, finally, the last word in the "biographical note", which

I was getting from the beginning:

"Finally, I would like to emphasize how precious my contact with the work of mathematicians the past (1800 to present), whether direct or relayed by more erudite than me, such as A. Weil and JP Serre. We "are dwarfs on the shoulders of giants", and more beautiful modern mathematical theories are motivated by the hope of resolving some of the problems that we have inherited.

Pierre Deligne "

As is often the case, my first reaction to this, a kind of profession of faith in this case, stopped at the surface, in the literal sense - but I had yet felt, confusedly, that beyond the literal sense there was something fishy. This quote (from a famous mathematician probably, I was supposed to have read, "Like everyone else") did not come back to me. I felt a deliberate modesty or humility, which was all a pose, and that just does not fit the simple reality. At the limit, it deliberately borders on absurdity: if each generation were "smaller" format than previous, it has long been the human species would have died, out of breath, reduced to a paltry mass homunculi! I know that creativity in man is no less today (nor, probably, more large) than a hundred years, or a hundred centuries. I know, too, to speak only of math, that such ideas and Such work of people I knew well, not excluding me from their number, were all the same honor the greatest mathematicians of the past. And I also know that **my** motivation in doing math,

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and not more surely than most of my old friends in the mathematical world ³⁷² (*), resides in "the hope of resolving some of the problems" inherited from my predecessors! If it were otherwise, our science is powerless to renew itself - it would have ceased to be creative.

What was supposed to shock me more in this profession of faith borrowed, or rather, me **pain** is that I knew that above all one who was more than any other person in the world I had known, had received a share of the "means" that had amazed me, and I had known him as a "cool" in his approach to mathematics things, what he was called to do great things, as little math

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mathematicians had the privilege to do. There was in me a sentence, and also as a p. 816

Despite, for behind the pose of one who claims to have found a humility in trade with major men of the past, I felt an **abdication**. An abdication of this creative force in him, it seemed have forgotten for a long time, and that made him well **anything** that suggested that this paltry image of the dwarf, perched on giant shoulders ³⁷³ (*).

This is the first time since I first read the biographical note, I try to identify what feelings that reading was first aroused in me. In the days that followed and without deliberation my hand, it continued to work. It is especially this last passage that continued to trot in my head, like a decidedly unusual thing, and had not "passed". Behind the apparent absurdity of the profession of faith which closes this short biographical text, I had to sense a **direction**, which was probably directly perceived to an unconscious level, and gradually rose to the surface layers, without yet thinking itself, as far as I remember. I knew, after all, my friend

Pierre had little more than I used to haunt the writings of the past. If indeed read more than me, were not the old books, but the latest reprints and preprints circulating in the media knowledgeable, and which always had the scoop. And I also knew it was not in Picard or other venerable precursors of the last century or even this century, especially my friend had the inspiration that nourished his work, since (and even before) I left the mathematical scene! And if it is true that he was pleased to "perch on the shoulders" of someone, not in a profession Public faith and rhetoric, but secretly and **actually**, I was after all well placed, since I reflected on a burial, to know **who** was the one who was, somehow, fresh! Instead of He-we-will-never-called ³⁷⁴ (**) (and which is nevertheless always present ...) is replaces verbally "the great men of the past," which in paragraph

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preceding it comes from elsewhere all p. 817

just tacitly attribute authorship patterns (aka "what is little more than a vague today skeleton") - and more vivid making **real** identity behind the figure of substitution...

I have observed many times that there is a force in man, apparently universal nature which pushes a voice against all odds, often misused and symbolically, desires and intentions (also aware and unconscious) that can not be manifested openly, giving them an outlet and a satisfaction that can seem trivial (in terms "rational" and according to the current consensus), and which are no less substantial. It is a force, in a way, that drives us, in spite of us,

proclaim the truth of our being the one who will listen (and there are many in all of us, "someone" which has a fine ear. . .), And this **despite the fact** that what is so "proclaimed" would be the greatest secret and would anathema to others as to ourselves. The land of election for the expression of this force is the dream, and this is one reason why the dream is a powerful key of all to bring us into
372 (*) Including, incidentally, Pierre Deligne himself!
373 (*) (25 February) This impression of "abdication" is strongly associated with that aroused by a "third element" in my praise Funeral. See the mention made of it at the end of the note "In Praise of Death (2) - or force, and the halo" (n ° 105), p. 459-461.
374 (**) Or, if you can not avoid it, it affects to appoint "by the band" in style "go!" rigor. . .
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knowledge of ourselves. But the fact of the intimate nature of personal dream, that speaks of ourselves to anyone but ourselves, this medium we by no means sufficient, it is improper to affirm the truth of our being **before others** , even symbolically, to the world. It is thanks to that behind every nonsense that seems to defy reason, hides a "sense" - or rather, nonsense is the **preferred means of expression** selected by the unconscious with infallible instinct, for **proclaim this sense** , both hidden and ostentativeness displayed in front of all 375 (*)!
This is certainly what I felt obscurely, in the days that followed my reading of this "nonsense": the "Dwarf" (yet to be born giant) standing on the shoulders of a "giant" (how to more modest means than the so-called "dwarf", perched on her while denying it. . .). One reason 376 (**)
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for my trouble p. 818
clearly aware of the meaning revealed by this nonsense was probably my reluctance to recognize me in this image to the punch of "giant"; or rather, perhaps, recognize me in a certain pose or brand that has indeed been mine and which, by the unexpected through this nonsense creaky suddenly interpellait me! Only weeks later, in the note of December 18, "The nerve in the nerve - or the dwarf and the giant" (n ° 148), I finally returned to the unusual image of the dwarf and the giant, by working on parts this time, at a time when the context of the reflection on the Burial was ready to welcome him. This image was immediately revealed (the same day) as an "image-force" crucial for understanding the relationship of my friend in my person, and deeply and especially for the beginning of an understanding (Called probably forever remain fragmented) the relationship of my friend to himself, that is to say also: the particular form taken by **the division in his own person** . And since the burial was implemented before any other, by my former student friend and former heir 377 (*) is the same image as that appears to me now as **the** nerve strength stubbornly at work throughout this long Burial, as his real **nerve** . It is central to the thinking within fifteen days following the crucial moment his appearing in the notes, while in the nine notes that follow, between December 18 (with notes already quoted "The nerve in the nerve - or the dwarf and the giant") and the note of December 3, "The enemy Brother - or placing" (n ° 156).
The "validity" of the nerve-picture Force role in my thinking takes this apparent benign image ence, that is to say, too, the question of
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reality in the psyche of my friend himself, such an image- p. 819
strength, expression of deep conflicts and motor for acts irrepressible compensation 378 (*) - this question, it seems to me, can only be decided by a "demonstration", ie by an approach known
375 (*) For another example, particularly ostentativeness, a **sense** proclaimed by an apparent nonsense, see note "The joke - or "complex weight" "(n ° 83). See also the comments in the note "The surface and depth" (n ° 101), including at the end of the notes (p. 440), and in that which follows, "praise of writing" (n ° 102).
376 (**) Another reason, which seems to have been the main obstacle is a certain **inertia** , or more accurately, a kind of **pusillanimity** to "believe the evidence of his eyes, even though what you see is pretty unheard of, never seen again and ignored and denied by all. "I was confronted again recently in the note" The accomplishment - or the moment of truth" (n ° 163). See especially note b. p. (**) on page 782, where I probe this kind of "disbelief" to the obvious. . .
377 (*) It is true that in this "implementation", he acted in close collusion with "the whole Congregation," which he has somehow been instrumental in the completion of a collective will. (See note "The Gravedigger - or the whole Congregation", n ° 97.) But it is possible that the same image-strength I have seen in my friend was also present at a "collective unconscious" in said congregation finds expression in the unconscious Individual lots among its members, in particular, in some of those who were my students (and not just in the only Deligne).
(May 12) This intuition has come a long way since those lines were written, and now it comes to me with strength the obvious. On this subject the note "The Messenger" (2) (n ° 181).

378 (*) This term "irrepressible" I have no intention to suggest that the presence of this force has become a kind of fatality inevitable, which would have escaped responsibility for my friend. The action of such a force in us is "unstoppable" in Because we like and stubbornly elude the knowledge of it, for the purpose to collect the various benefits and rewards that "buys" by the "ignorance" deliberately. The price is exorbitant, it is true, but also ignore the price is part of the even "deal".

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"Objective" which is supposed to win the membership of any party in good faith and reasonably informed. In my opinion, this fact is no doubt, and my personal conviction is not the result of such "Demonstrative" approach. She is thorough, it is true, in the reflection of the fortnight EVO-Ques now (thinking I will not attempt here to make a "summary" or "balance"). But she was present from day one - from the moment I took the penalty, for the first time in my reading, note black on white that it inspired me, as the dictation of a silent voice 379 (**) that would have me "Reminded" so that at bottom, already, I "knew". I had the "know", by faculties of perception not Extraordinary indeed, but incomparably more slender than those we commonly let go involved at a becoming aware **conscious** of things. These enforcement mechanisms of the is seen "somewhere" in us, and that "part" not with the routine logic received our ways of seeing (or rather, do **not** see) the reality around us - these mechanisms then, is it necessary to say, are as strong in me than anyone. If there is a difference in this respect between me and others is that I finally am realize their silent action in me, especially since I happen to "meditate": I take worth sometimes under the pressure of an indiscreet curiosity, **ask** about these things I want to know, which has the effect of **trace** on the surface of consciousness which was dimly perceived in the deeper layers and make it take shape.

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The initial perception is indeed transformed during the **work** , which gives it shape while causing p. 820

in broad daylight. This work is also a **sedimentation** , whereby gradually conscious translation perception (in intelligible words) emerges from a subjective preconceptions that marred without my knowledge. In this case, one of these a-prioris distorting (detected in the last notes cited earlier) is the mechanism ingrained in me that leads me to "see me yang", and this even in situations where, clearly, it is the yin side of my being, "the woman in me," which provides the key to understanding (or at least **one** of keys, or the "lights", essential for a nuanced understanding). I have spoken elsewhere of the **signs** , any "subjective" certainly yet unmistakable, telling me the **progress** of such work 380 (*), and other also that alert me when I am wrong, or when there is momentary trampling, which ends as soon as it is detected.

18.4.3. (3) tune to the tomb - or sufficiency

Rating 167 (25 February) The most of the day yesterday was spent writing a long letter to a young colleague, Norman Walter, who seems motivated to engage in the theory of motives, without being impression sionner a decidedly bleak situation. It was this time eight dense pages (machine write), on the "six operations" for the categories of reasons and for the "categories coefficients" more important. This made me realize again with amazement, that for twenty years that the question is posed (not in the literature, it is true ...), no "good" categories coefficients "usual" (Sic) for the cohomology of schemes has not only been defined at present, with the only ex-receipt of "l-adic coefficients" for the first to the base schema X; and yet, this work there in the Of course part of triangulated categories (essential for formalism six operations), made in the thesis of Jouanolou, was never published. I myself have never held hands a copy of the work

379 (**) This image of the "dictated" by a "silent voice" came to me more than once, I believe, in writing and Crops Seeds, and every time as matter of course. This is just not the repetition of some "stylistic effect", but reflects (I think) a common aspect, more or less obvious from one situation to another, the discovery process.

380 (*) See note on the subject "The child and the sea - or faith and doubt," n ° 103.

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thesis that student 381 (**). These are striking signs of the general disaffection of the program foundation that

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I had undertaken in the sixties, and I certainly would not have suspected that he p. 821 not continue the momentum gained, but it would be snapped (or "cut up"...) so soon after my departure mathematical scene. . .

When the first number is **nilpotent** on the scheme X, the category of "l-adic coefficients X"

$Z_s^*(X)$ say 382 (*), should be different from that of "crystalline coefficients", with operation Frobenius F and **filtration** in the key. The construction in the form of this triangulated category, not to mention six operations, always waiting for someone to splint it. As for the "gluing" of the case-adic "ordinary" (Quotrouvable well!) And if "crystalline" precedent, via a "mysterious functor" I glimpsed from the late sixties, to achieve the definition of the coefficient category Z^*

$\Gamma(X)$ unrestricted

on, it is still not even in the simplest non-trivial case of all, $X = \text{Spec}(Z[\lambda])$ (*)

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As p. 822

coefficients De Rham-Hodge $\text{DRHdg}^*(X)$ 383 (*) for a general scheme, I had no ideas clear how to describe them, and Deligne was unable to identify the really satisfactorily. The idea innovative here is due to Zoghman Mebkhout - and we know under what circumstances adversity he had to work, and what was the fate that was to his person, once the scope of his ideas was (partially) re-known. Still, we finally have a secure thread to address a shaped building

categories $\text{DRHdg}^*(X)$, in terms of finiteness conditions, Holonomy and regularity on complex of "crystals" (absolute - ie related to the absolute basis $\text{Spec}(Z)$), with perhaps given added-silenced a "filtration Rham" and another "filtering by weight" - and hopefully we get to

381 (**) Jouanolou of thesis work, done without real conviction (what distinguished it from that of all my other "students before my departure"), has dragged on, and the defense took place after 1970. No more than that of Deligne I do not remember being informed of this defense, let alone have been contacted to be part of the thesis committee. Jouanolou did not see fit to send me a copy of his work. I wrote to him last year to request one. He had me informed (no comment) to regret it none left. . .

(May 12) My memory here misled me - actually Jouanolou thesis of the defense was made in 1969. For details on this subject, see the final score (not yet written at the time of this writing) n° 176 7, in the sequel "The Sixth nail (in the coffin)."

382 (*) The * after the indication of the base ring for the chosen theory (here, the ring $Z[\lambda]$) indicates that work, not with "Building beams" without more (l-adic herein, in a suitable direction) but with **complex** "Building" beams, suitable triangulated categories of objects (including the shape description can be tricky, then Just as the category of constructible beams, ie $Z_s(X)$, is already known). Working with patterns (By which, most often, we hear "iso-patterns" ie the "isogenic patterned closely," forming a Q-Abelian category) the categories of natural coefficients y "achieve" such (iso) grounds must themselves be Q-Abelian, so here it is Q take the (X) , Q^*

$s(X)$. When we want to work with all the at once, the most natural is to work with a category of beams (or complexes such) "adelic" which the base ring is the ring of adeles $Z \otimes_{\mathbb{Z}} \mathbb{Q}$, obtained by "tensoring" the Product categories all coefficients Z^*

$\Gamma(X)$ by Q .

Care should be that when the first number is not the first in the scheme X , then in the description of "coefficients l-adic X , the nilpotent elements of $Q(X)$ can not be ignored - they operate in the vicinity of the fiber $X(\lambda)$. A fortiori, it will be the same for adelic coefficients on X , which brings coefficients (also hypothetical the moment) De Rham-Mebkhout which it will be discussed in the next paragraph. I also feel the two main types of coefficients, the coefficients and those adelic De Rham-Mebkhout (provided you bring the latter of the whole structure of wealth to which it is actually lower allusion), are of "loyalty" comparable, as Descriptions (weakened) or "achievements" of the same **pattern**, surrounded closely by one as the other. About this "Fidelity" I had also advanced in the sixties conjecture, neighboring that of Hodge and Tate (my friend was buried with the rest. . .). I intend to return to the volume of Reflections, devoted to the "wide array of reasons". We feel a strong kinship between the two coefficients (adelic, De Rham-Mebkhout recently taken here "in isogenic near"). The advantage of the latter on the former, which makes them appear as "thinner" in certain respects, is that the ring natural base for them is Q , then this is the ring of adeles (much larger) for adelic theory.

383 (*) (May 12) As discussed below, the name and the notation "in improvised" prove unsuitable. I finally opted for DRM notation $^*(X)$ or $\text{Meb}^*(X)$, dual $\text{DRD}^*(X)$ or $\text{Del}^*(X)$, for the coefficients of respectively Rhammebkhout and those of De Rham-Deligne. They have been left behind by their father in 1970, and adopted by me knowingly in the year of 1985 as one of the basic ingredients (with coefficients Mebkhout) of grothendieckienne range. . .

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do something, again, that takes standing without limiting itself to the characteristic zero, and for given positive feature gives more or less crystalline coefficients "hatibuels" (sic). The thing extraordinary is that I seem to be the only person in the world to feel the task - Zoghman Mebkhout itself, probably educated by bitter experience, seems to have the slightest desire to think not was it a day longer questions the foundations of his philosophy! It would be wrong of me to wonder, then I see Deligne lead by example with Hodge theory, cutting short his own momentum, which had animated the "my time" and brings out a rich approach promises (unfulfilled...). I suspect

formalism (not even still in limbo) coefficients Hodge (above algebraic varieties complex X) should be more or less contained in the coefficients that sometimes I called (following my language reflexes sixties) "De Rham coefficients", or as "De Rham-Hodge" for remember the object link **filtered** De Rham with the object **graduated** partner (known as "Hodge"). But given the role critical philosophy Mebkhout to apprehend these categories coefficients (which are always hypothetical, of course), it would be better probably call them "**coefficients De Rham - Mebkhout**" (no-DRM tion $*$ (X)) or, in a pinch, "coefficients De Rham-Hodge-Mebkhout" REHM $*$ (X). when X is finitely generated over the field of complex C is expected to reconstruct the hypothetical categories coefficients Hodge

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 HDG $*$ (X) (I certainly do not call Hodge-Deligne, while Deligne p. 823

I seem to have done everything to hide the problem, far from the highlight!), more or less "circular" and the six steps above, from the coefficients De Rham-Mebkhout which one simply adds additional structure (transcendent nature of it) called "Betti". he therefore appears to me that the main issues for the description of "categories coefficients @atural@ the cohomology of algebraic varieties 384 (*) are currently the following:
 1. Description of the category l-adic coefficients $Z_s *$ (X), for the first given number and **any** scheme X (not necessarily "first in"), and a formalism for these six operations coefficients. (This appears more or less equivalent to the "mysterious functor".)
 2. Description of the DRM category $*$ (X) of "coefficients De Rham-Mebkhout" for any scheme X, or possibly similar categories DRM $*$ (X / S) for related schemes ($DRM *$ (X) = DRM $*$ (X / Spec (Z)), And a formalism of the six operations to these coefficients.

It is possible that for 2) several possible alternatives, according to the richness of structure that decides to introduce in these coefficients. The "theorem of God" (aka Mebkhout) shows in all cases priori (for X of finite type over the field of complex, at least) there must be a formalism six variances for crystalline coefficients to Mebkhout without entering it "the bargain" filtrations to Rham and / or by weight. A third type of significant additional structure which necessarily exist on the crystalline De Rham complex X-Mebkhout ksur associated with a pattern (or "Absolute coefficient") on a scheme X generally will be given for any prime number p of "Frobenius"

$K(p) \rightarrow K(p)$
 Where $K(p)$ denotes the restriction to sub-scheme X (p) derived from X by reduction mod. p, and the exhibitor (P) denotes the "Frobénusé" $K(p)$, ie its inverse image by Frobenius $X(p) \rightarrow X(p)$. Thus, according to the 384 (*) These questions, in a sense, are preliminary (or tacitly assumed resolved) for the development of yoga reasons with all the precision and generality, which lies on him, and I saw him from the sixties.

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18.4. The Skeleton Dance

Additional structures (among the three just named) we can propose to introduce on a crystalline complex, we can predict a priori **eight** variants in total, for a notion of "De coefficients Rham-Mebkhout. "It@a job

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 on only parts that will show us which of these variants p. 824
 beautiful, well give a formalism of the six operations. It is also true that for the purpose of yoga reasons, then we propose to find "algebraic" simple objects, which "stick" as close as possible the grounds to describe as accurately and richly as possible the structure, the coefficients are "the richer "which seem a priori" the best. "This is where the vast wealth that lay elsewhere The main charm of the coefficients Hodge - even to the point that one could hope to rebuild all Parts category patterns on C if the Hodge conjecture was true), or even, on those grounds every finitely X C.

This brings to my attention that it is possible that some of the structures are "superfluous", they arising from other (but in a way it is true, so hidden, that will be difficult to explain in terms earth-to-earth) 385 (*). For example, the De Rham cohomology (relative to S) of an X-pattern on a smooth Another S, I showed (late sixties) 386 (***) the existence of an (absolute) Canonical without curvature, which I called **Gauss-Manin connection** . As a result, the structure Hodge-Deligne associated Deligne by a smooth scheme X C (and certainly even that associated with any finitely scheme X C) is canonically provided with such a connection, based on the subfield First Q. That is if the motivic cohomology itself already reconstitutes

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 from its "realization p. 825
 Hodge, "it means that the entire structure could be called Hodge" motivic "or" algebraic "

(ie from a pattern), there would be such a canonical connection Gauss-Manin. It would not be difficult therefore, likewise, describe other canonical structures, more subtle, associated with a structure of Hodge-Deligne, and whose existence "follows the pattern": Operations existence of some Galois groups profinite on $\text{Bet}(K) \otimes_{\mathbb{Z}} \mathbb{Z}_1$ (where $\text{Bet}(K)$ is the "network" underlying structure Hodge-Deligne K), and "structure Frobenius" $\text{on} \bmod p$ reductions "(for almost all p). It is this rich multiplicity of structures no apparent link, the link is hidden "**reason**" **common** to all these structures - is this wealth for me represented (and still represents) the peculiar fascination of the topic of cohomology of algebraic varieties, and the fascination of the "reasons" which are like delicate melody town that gives life and meaning to the subject to countless variations 387 (*).

385 (*) As remark that goes in the same direction, I note here the need to pay attention to possible compatibility, more or less hidden, to impose on all structures associated with a type of "cohomological coefficient" given. I am thinking Here, especially, the compatibility (more or less algebraic nature) that are automatically performed in the case of coefficients "motivables" (ie, originating from a pattern). It is plausible that it will impose in the categories proposed coefficients, if we like to have a formalism of "six operations" (regardless even about "identify" the patterns as closely as possible). I refer in particular to the conditions holonomy and regularity at infinity for the coefficients of Mebkhout, and also (if one puts additional structure as a filtration Rham) conditions to Griffiths connecting filtration Rham and Gauss-Manin connection . These examples make it clear enough, I suppose, how the task fundamental to describe the "good" category cohomological coefficients, with the constraint "six operations" will require to explore and full use of all structures considered to date on "the cohomology of algebraic varieties", and relationships that can link these structures. It was also there from the beginning, the main reasons about yoga - providing **unit** behind a disparity, and at the same time, a thread safe driver to recognize this disparity.

386 (**) (May 2) In fact, it was in the year 1966.

387 (*) (March 26) After my short reflection on issues (closely related) of various types of "categories coefficients" (to "Identify patterns"), and "algebraic terms" that must meet a cohomology class "algebraic" (ie from an algebraic cycle) which was discussed at the beginning of the note yesterday (n ° 176), I decided to include a reflection on the reasons, the "coefficients", and the standard conjecture, volume 3 Reflections (containing the last part of Crops and Sowing). I think I now have the principle of a description in the form of "the" triangulated category of motives on scheme, at least in the critical case (which we should be able to return by crossing the border) where it is of type finished on absolute basis \mathbb{Z} As one new ingredient relative to my ideas of the sixties, there is the "philosophy of Mebkhout" (expressed as the "theorem of God "). In addition, I suppose solved the problem (surely already affordable 665

If there is anyone, besides me, who have heard and felt the melody and that is a long left soak while she was leaking and unfolded before him, it is Pierre Deligne. If there is someone who I have given something living, delicate and vigorous thing in which I put the best of myself, nurtured over the years of my strength and my love - it©him. This was something done for deploy to the grand day, to grow and to multiply - something that was seed that was lap, ready to transmit the life that was in it. This short contact yesterday and today was a bit like the **reunion** with something I had long since lost sight of - the reunion with not, words, or concepts, or inert objects, but with a

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thing filled with a **life** intense. And this contact

p. 826

measure also makes me again that this "thing" I had left is large enough and deep enough to inspire the entire life of a mathematician who would give it body and soul, and other mathematicians after him - because his life probably will not be sufficient to the task 388 (*).

It is a strange and welcome coincidence that this meeting will be made at the time I just made another "meeting" just as unexpected: the encounter with this text where my friend is expressed precisely in refraining from naming it, about this thing that had me most at heart, among all those I have put his hands. "We do probably knows little more now than a vague skeleton". . .

These words continued to haunt me during the three days elapsed. I recognize the sufficiency - the sufficiency of one for whom "nothing is nice enough to deign to rejoice." And, without seeking, came back the memory of the "**tomb**" 389 (**). The same impression was revived in me, speaking through this even mute and insistent image. This living thing that was dear to me, I had long ago grown the trust between loving hands - and it is in a tomb cut the benefits of wind, rain and sun it languished during these fifteen years I had lost sight of. Today I find bloodless, "a vague skeleton ...", object disdain patronizing one that was good enough **to use** it, and who has custody never **give** .

18.5. THE FOUR OPERATIONS (a corpse)

18.5.1. (0) Detective - or life in pink

Note 167

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(April 22) The note that was chained here as had long planned name: "The four

p. 827

operations "(the name that will be explained in detail how early the following note 390 (*)). I thought devote to this "ordering" (a survey that was me then seemed complete) a note or two at any break. For almost two months now that have passed since then, and given the influx of twists unforeseen, I have not finished in time yet to fully around the subject. At one year away, it is as if the surprises scenario of the discovery of the burial was repeated on a different pitch.

Finally, in the table of contents, the famous "Four operations" have come to mean not

not a note or two, but a large set, a dense can I fear, of **thirty** notes and sub

ratings 391 (**). They are grouped into eight parts (1) to (8), names (I hope) suggestive, since (1) "

this!) the "mysterious functor", which plays a crucial role in the description that I see now.

388 (*) (March 26) It seems possible, now that I have overestimated the extent (but not certainly scope) of the task. See to it about the note b. p. Previous, dated the same day.

389 (**) On this impression, strong and long unspoken, that haunted me after the "second turn" in my relationship to Deligne, see note "The Tomb" (n ° 71).

390 (*) (May 12) After four scindage this old notes "Silence" (n ° 168), the "next note" is "The four operations

("ordering" an investigation) "(n ° 167)".

391 (**) (12 May) Since peremptory these lines were written, the number has further increased to fifty and notes

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18.5. THE FOUR OPERATIONS (a corpse)

nest egg "to (8)" The Sixth nail (in the coffin). "Along the way, I was led to revise thoroughly

the four notes 392 (***), which had formed the "first draft" of "Four operations" (between 26 February and 1

March). I explained at the beginning of the note "Threshold" (n ° 172) March 22 (there is exactly one month) at

about this departure from the spirit followed elsewhere in writing Crops and Seeds.

The four notes in question are: "**Silence**", "**The maneuvers**", "**Sharing**", "**The Apotheosis**" (n ° s

168, 169, 170, 171) 393 (***), devoted successively to make a sketch

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overall each of the four p. 828

"Major operations" retraction and ownership around my work first, that of Zoghman

Mebkhout then. I would advise the reader to be limited to first read these four notes, excluding

footnotes page (more plentiful here than in any other part of Crops and Seeds), and sub

ratings (unusually numerous and also expanded) to which he referred in the "main" text.

It could continue this momentum with the following four main notes: "**Threshold**", "**Album of**

family", "**Climbing (2)**", "**The Funeral 'im Dienst der Wissenschaft**" (n ° s 172-175), which,

they no longer have anything technical.

The curious reader to more detailed knowledge of how tortuous mazes of these "four

operations "may be included in a second reading the footnotes, notes and sub-notes, and even (if

did not read the first part of the burial, or if he feels the need to refresh his memories of reading)

refer to as you (like myself have often done) to the passages of the Burial I (or "The

dress of the Emperor of China ") to which it is widely referred.

The essential content of each Trentes notes that make (or which describe and comment) "The

four operations "is, each time, non-technical. I think it can be understood by all

interested and intelligent player, even if he is not an expert in cohomology of algebraic varieties,

nor mathematician or so little "scientific". For those who nevertheless hesitate to engage and make

snap up all the mysteries of the "art of the scam", I would recommend especially subscores

following, the substance seems richer, and whose interest visibly exceeds that which can

take the "dismantling" of "shenanigans" preposterous and sometimes still mounted with art (to use

one that asks only to leave bamboozled. . .). These are the subscores "**Eviction**" (n ° 169 1) and "**The**

real math. . .", " ... and the "**non-sense**", "**graft and creation**" (forming the first three of the

five subscores grouped under the name "Formula"), and finally the four subscores in note "The Apotheosis"

(n ° 171), concerning the strange adventure Zoghman Mebkhout: "**Hatching a vision - or the intruder**," "**The**

Mafia", "**Roots**", "**Carte blanche to pillage**" (n ° s 171 1 to 171 4). So these eight subscores

(from a total of twenty-one 394 (*)) I particularly recommend to the reader.

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The other thirteen sub-notes, the player who will only do their "documentary value" for- p. 829

nevertheless would read in leisure moments, in the spirit in which he read a Roman incredible

adventures of police, where the improvised amateur detective (in my humble person) is tracking and gathers

the "clues", some tenuous and elusive and other so huge that no longer able to see; which

clues eventually assemble into a **table** (manners) colorful and irrefutable, where a "second

Monsieur Verdoux (aka Landru), smiling and affable "proceeds to butchering-calcining its candid and in-

nocentes victims under the tender eye (or admiration) of all the good people of the neighborhood. They have since subscores, and no evidence that (as a sea...) it still goes up. . .

392 (***) (May 12) These notes, having taken prohibitive dimensions were finally sciendées each several, in notes n ° s 168 (i) - (iii), 169 (i) - (v), 170 (i) - (iii), 171 (i) - (iv).

393 (***) (May 12) These notes, having taken prohibitive dimensions were finally sciendées each several, in notes n ° s 168 (i) - (iii), 169 (i) - (v), 170 (i) - (iii), 171 (i) - (iv).

394 (*) (12 May) became twenty and seven meantime, not counting the sixth nail in the coffin (which has seven notes and pleasant delectable).

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long accustomed to the smell a bit special, which obviously do not bother anyone. This is even more an example that took on its friendly and astute neighbor, and chimneys and purr graillonment vied for.

The "detective", built entirely, only has to withdraw on tiptoe: obviously, the agreement is unanimous here, and everything is for the best in the best of worlds. . .

18.5.1.1. The four operations - or "ordering" an investigation

Note 167 "

(26 February) 395 (*) I seem to have been around more or less, of the Burial. A lap

Although incomplete and provisional - but for now, I think I will not go much further. I feel it is

a decline that I need now, and it is now time to finish. I still have to take stock of

what I have learned during this impromptu meditation has been writing Crops and Seeds.

This is the reflection on the burial which constituted by far the largest part of my work. this re-

bending continued consecutively on two distinct levels. There was first of all, after "the act

respect "that was much needed double notes" My orphans "and" Denial of inheritance - or the price of a

contradiction "(n ° s 46, 47), the gradual discovery of the Burial" at its best ". I had

much sniffed the air for seven or eight years - "discreet derision wind" vis-a-vis a work and a certain

style, and this "plea" equally discreet and seamless, reserved for those who pretended

yet to be inspired and,

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one way or another, "wearing my name." This is the aspect of the In-

p. 830

INTERMENT, by mode and by a "consensus without flaws," which is discussed in note "The Gravedigger - or

the congregation whole "and those which precede" n ° s 93-97), forming the Procession X alias "The

Van Funeral ". This aspect, including the apprehension remained broadcasts over the years, fault

to take the trouble to devote a detailed reflection, has greatly clarified in the

work without making a fortune for me is really new.

The new fact by cons, which I was confronted for the first time on April 19 last year, or the "fact

various "if you will, is some large scale operation which took place around my work, and

that as the only mathematician who has assumed, after my departure from the mathematical scene, the thankless role

perilous "continuer Grothendieck": Zoghman Mebkhout.

The discovery April 19 (Lecture Notes Volume 900, 1982, which unearthed the reasons are,

after twelve years of dead silence 396 (*) and without mention of myself) was the starting point of this

can be called an investigation in the narrow sense of the term: an investigation of the fate that had been reserved for my

work, and first of all by those who had been the first and main stakeholders, namely, my

students. This survey has updated many facts, some more unexpected than others, that the days

and weeks, have assembled an array, somehow outside of what was the burial and

what were the key players. This table is probably not complete, but it is rich enough

detail perfectly accurate and irrefutable, to suffice my curiosity in that direction. This is the

first of two "levels" of reflection, to which I alluded earlier. It is essentially

the "first breath" in thinking about the burial, continuing until April 19 to June 10, and

ending by "illness episode."

This is also, in almost exactly, the "Burial I" (or "The dress of the Emperor of China") of

my notes. We must add more note are "The Eulogy Funeral (1) - or compliments" (n ° 104), which is 12

395 (*) This note, which originally was to be called "The four operations" and take over from "The Sound tomb - or

sufficiency "(note ° 167) is nearly two months prior to the note (kind of introductory) above," Detective - or

life in pink "(n ° 167) I advise to first read it.

396 (*) (April 19) for a correction about these "twelve", see sub-note "Pre-exhumation", n ° 168 1 .

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May, but was rejected (probably somewhat arbitrarily) in the subsequent and final procession "The ceremony Funeral ", part of " Burial II. "I would join in

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this core "survey", forming the "first p. 831

level "of reflection, the note that follows the note quoted, namely" the Eulogy Funeral (2) - or strength and halo "(n ° 105) 397 (*), continuing also still in the comments of the following note" The muscle and tripe (yin yang bury (1)) "(n ° . 106) The last two notes are late September - early October. Also, in the line "Praise Corpse" ie that of the (very few) written documents where Deligne expresses so little about me, you can join this investigation both notes recently raised by Biographical information Deligne, namely "Requiem for wave skeleton" and "The profession of faith - or true in the false "(n ° s 165, 166). Finally, it adds the note "The dot the i "(n ° 164), giving an number of details (especially hardware), most provided by Deligne himself during his visit home last October 398 (**).

After the episode Medicare, ending any intellectual activity for more than three months, the "second breath "of reflection (or" second level "I mentioned earlier) was motivated by an effort to com- take the **direction** of this set of facts, some really big if not incredible, that the investigation of the April and May had brought to light. The central portion of this reflection is "the key of yin and yang "in largely independent of the theme of the burial itself, which relearn nevertheless appears periodically to restart each time a meditation on myself, on my life and on existence in general.

It is obvious also that the two levels of reflection, "investigation" and "meditation" are in no way independent nor clearly separated, but they interpenetrate. In practical terms, this is reflected by the presence, already throughout the first part of the burial of an effort to **understand** the meaning of what I discovering the days, and also by the appearance in the second part yet of material facts in addition to those already obtained in the "investigation" preliminary.

My purpose right now is to do a "check" or a summary in outline, the **facts** appeared daily throughout the investigation,

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facts I have never taken the trouble even to order so as p. 832

is incoherent. This will be an **ordering** of what known me now for this "operation

large scale "to my work 399 (*) and the Mebkhout. Next it the latter or mine

who paid the price, and the next part of my work which was taken as a target, I actually distinguishes **four** main operations ("the four operations" in short), I would first like to review. it

found that the order in which they are reported to my attention during the discussion also coincides (to a mini-inversion about the last two) with the chronological order in which they are engaged, my "start" in 1970 (and even before).

18.5.2. (1) The ape

18.5.2.1. at. Silence ("Patterns")

has 1 . Context "Patterns"

397 (*) This paper was also scheduled the day after May 12, when was written the previous note "In Praise of Death (1) - or compliments. "I realized then that the text that I had to look a little closer was a real

Mine, I was far from being exhausted. . . (for some details of the Funeral Eulogy, see the beginning of the note "The Apotheosis", n °

171).

398 (**) See about this visit notes the "The accomplishment - or the moment of truth" (n ° 163).

399 (*) Based on the facts known to me, this is the only part of my work, placing himself between 1955 and 1970 devoted to the development of my ideas on the cohomology of patterns and algebra (co) homology.

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Rating 168 (i) the operation I "Patterns"

Drawing inspiration from some ideas of Serre, and also the desire to find a "principle" (or "pattern") common to the various "avatars" purely algebraic known (or prospective) for the cohomology Betti classic of a complex algebraic variety, I was introduced to the early sixties the notion of "pattern". Throughout the sixties and especially from 1963 400 (**), and in the margins of my tasks to re-foundations of action, I developed this theme a "yoga" (or "philosophy") both rich and accurate. This broad theory remained speculative and likely to remain so for a few more generations 401 (***), of- fruit yet in the immediate (and until today) a very safe guide to recognizing it in situations occurs cohomology of algebraic varieties, both to guess "what is right in expect ", suggesting that" good ideas "to introduce and sometimes to provide approaches towards demonstrations. I say about this in the Introduction to Crops and Seeds

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("The End of a silent" p. Xviii):

"Of all the mathematical things that I had the privilege of discovering and bringing to day this reality motives still strikes me as the most fascinating, the busiest mystery - in the heart of the profound identity between the "geometry" and "arithmetic". And the "yoga of reasons" which led me this long ignored reality is perhaps the most powerful instrument of discovery that I have reached in this first period ⁴⁰² (*) of my life mathematician. "

Apart provisional sketches of an explicit construction can (among many others) to category of semi-simple patterns on a body, the ideas I had developed this theme in my notes Personal remained at the stage of oral communication. I was too absorbed by many other writing tasks foundations text ⁴⁰³ (**) to find the leisure of months required to develop my handwritten notes, so as to make a "supervisor" of all the inner vision that had developed in me enough "dug" to look me publishable. From 1965 until When I left the mathematical scene in 1970, my main contact for my meditations motivic (and others), and also one that has fully assimilated the yoga patterns and who has felt all scope was Pierre Deligne.

Details are provided subject to the "yoga of reasons" (more detailed as in the part of the Introduction which is extracted the passage quoted) at the end of the note "My orphans" (n ° 46) and especially (about including the genesis of yoga) in "Remembrance of a dream - or the birth of reasons" (n ° 51). For insertion the "yoga of reasons" in the formalism of the six operations (which remains, even today, and since my ⁴⁰⁰ (**)) The year 1963 is the "start" in force étale (developed in the SGA 4 seminar in 1963/64) which finally brought an abundant fodder to motivic ideas, which until then had done little figure speculation. It was the following year that I develop the formalism of "motivic Galois group", whose foundation detailed concept was developed (according to the theory of program I had submitted to it) in the thesis of N. Saavedra only published in 1972 (Springer Verlag Lecture Notes n ° 265).

⁴⁰¹ (***) (April 8) It seems to me now that this theory is not so far "on the horizon" that have seemed to me - for some only that finally eventually make it so! On this subject the comments in the note "The Miser and the crumbling" (n ° 177) of March 27th.

⁴⁰² (*) If I am here restriction on "the first time in my life mathematician" is thinking of the "geometry of yoga algebraic anabelian" which seems to be of a comparable depth and scope, it is discussed, so slightly in "Sketch of a Program" which will be included in the "Reflections" as a result of Crops and Seeds.

⁴⁰³ (**) This is primarily EGA texts (Algebraic Geometry Elements in collaboration with Jean Dieudonné) and SGA ("Algebraic Geometry Seminar Marie Wood), these only last written or together (with particular students ment), following the guiding ideas and project managers of my own. During the years 1959 to 1969, the "speed" means these texts, all without exception have become standard reference texts, was a thousand pages per year. This work foundations stopped dead overnight, since my departure from the mathematical scene. On this subject the note "the Yin Servant, and the new masters" (n ° 135).

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18.5. THE FOUR OPERATIONS (a corpse)

Initially ignored by my students

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cohomologistes, as a fundamental structure in homological algebra. . .), p. 834

see note "The melody in the tomb - or sufficiency" (n ° 167). For the filiation of ideas (fully retracted in the literature) around yoga weight (which constitutes an essential ingredient of yoga Memorandum) and the theory of Hodge-Deligne (directly after the latter yoga), see note "points the i" n ° 164 (Part II 4) and the sub-grade (n ° 164 1) which follows.

has 2 . **Burial** . . .

Rating 168 (ii) The operation "Reasons" consisted, first and soon after my departure from the mathematical scene, by e **scamotage** systematic yoga patterns and the very word "reason"; and then, after a pause twelve ⁴⁰⁴ (*), and with the exhumation (in 1982) of a narrow version of yoga in the retraction of my modest and deceased, as having something to do with Yoga said.

The first obvious retraction of yoga as the "yoga of weights" is placed already in 1968, so as soon before I left, in the article by Deligne (to Publications Mathematics) on the degeneration of suites spectral. This is discussed first in the rating "Weight canned and twelve years of secrecy" (written note before the discovery of "memorable volume" exhumation) and detailed manner at the beginning of the note "The eviction" (Notes n ° s 49, 63).

This sleight-stroke sensor in the absence of any reaction ⁴⁰⁵ (**), continues and is accentuated with Hodge Articles I, II, III Deligne, exposing the beautiful generalization Hodge theory developed by him in 1968/69. While this theory comes directly from yoga reasons (as mentioned above) no hint in this direction is made in Hodge Hodge II or III - something all the more glaring that Hodge It is the thesis of Deligne, who had been my student during the crucial years of his forma

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tion 406 (*). p. 835

As for the short "announcement" Hodge I (at the International Congress in Nice in 1970), Deligne it to a terminal Reference inch cryptic half-line "a conjectural theory of motives Grothendieck" (in a breath with a bogus reference in Serre, apparently intended to deceive 407 (**)). The retraction is continues with the presentation of "Yoga weight" at the International Congress in Vancouver (1974), where the name Serre nor mine is more pronounced. In this paper, nor in the Congress I Hodge Nice International (1970), he also breath word of an important part of yoga he held me, 404 (*) (April 8) To a correction about these "twelve", see sub-note "Pre-exhumation" (n ° 168 (iv)), which follows this note "Silence".

405 (**) It was me in the first place that such a reaction could and should have come. So in hindsight dishonesty in presenting this article appears obvious to me (note cited, n ° 63), I did not have my own righteousness (or honesty) to take note, in the presence of a "slight discomfort" when I held the paper in the hands, and I walked quickly. the about the role of complacency or ambiguity in me, that came to me during the debate on the Burial, see Note "Ambiguity", n ° 63 ". At the conscious level at least, the thought of the possibility of a professional dishonesty, Deligne at home or any other of my students had never touched me; or rather, I pushed on various occasions where dishonesty was obvious and pointed to my attention by the "malaise" never identified.

406 (*) There was some kind of collusion between Deligne and me to retract his pupil relationship to me, it being understood that he was too bright so I can claim to have been his "master". I update and review this complicity in note "Being apart" (n ° 67 ☹)

407 (**) This section of Serre on Kählerian analogues Weil conjectures, who had been the "detonator" triggering me the "standard conjectures". "This is a nice article, it is not about wanting to minimize. But I know that Deligne himself would be hard to explain how this article would have been "a source" for his generalization of the theory Hodge - and probably no one ever thought to ask. Having attended closely to the outbreak of the theory Hodge-Deligne, I know what was its source (see this footnote ° 164 1 already cited) - and it☹not in the statement Demazure on Baba defining the grounds that he found! He cites this article as a reference to "the theory conjectural reasons Grothendieck ", so as to give the impression at any reader who is really knowledgeable (and there were no masses to be knowledgeable. . .) Said "speculative theory" is reduced to the statement in question Demazure taking advantage and the absence of any trace published more detailed the yoga patterns.

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the motivic context (which remains strictly you): the behavior of the concept of weight by "six operations" and, first of all, by $R^!$ and Rf^* . This is one example among many of a become common practice, which Deligne seems to have been one of the first developers: it is reserve the exclusive knowledge of the "big issues" that arise in a given domain mathematics, a small group of "people in the know" (or even, in its sole person), so it ensure total hegemony, instead make them available to the scientific community and allow everyone to be inspired 408 (***). For all I know,

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this problem is nowhere mentioned before

p. 836

is resolved by Deligne in his article "Weil II" in 1980 (in the case of $R^!$), without of course mentioning me (Which was communicated to him the relevant conjecture in the motivic context, the context of the -adic it Trafficking is a reflection, just as would be the context of the coefficients De Rham - Hodge. . .).

To the (fragmentary) where I know the work of Deligne or can I have an idea, I think to say that yoga reasons he had from me was the main inspiration throughout his work. He kept this secret source, maintaining until 1982 409 (*) dead silence around the concept of reason. The only exception (except error 409 (*)) is the "half-line control" of 1970, just as incomprehensible 410 (**) any other than he and I (and rigor, in Serre perhaps) two years early (in the article on the degeneration of spectral sequences) his cryptic reference to "considerations weight "which made me conjecture" a special case "of the result of degeneration (see note cited above "The eviction", n ° 63).

has 3 and exhumation

Rating 168 (iii) Sudden change of scenery with the publication of "memorable volume" Lecture Notes 900 411 (***). The grounds are excavated there in big bands, and part of the original Yoga is finally revealed. In this volume, where my name appears two or three times "in passing" and as the merest chance, nothing could do suspect the reader that I am something to do with the ideas that are developed there.

These ideas are presented in such a way that there can be no doubt in the mind of the reader, the brilliant lead author of the volume, Pierre Deligne has just discover them and present them there all hot. It is true that, any more than Nice or Vancouver it claims not that it was he who discovered Yoga weight therein explained for the first time in the literature, it is said nowhere

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p. 837

clear here that it is he who has found all these beautiful ideas developed (apparently) for the first time in volume, also centered around a beautiful theorem which he is indeed the author. This is the style "thumb !" where he is a master, on which I comment first in the rating "Go!" and in "The dress of Emperor of China" which follows (n ° s 77, 77 © see previous notes, written in the emotion of the discovery of the "memorable volume": "The Burial - or New Father", "The new ethics - or 408 (***) On this new mentality, which I have never encountered track until my departure in 1970, see note "Yin Servant, and the new masters", n ° 135, and the end (dated February 28) the note "maneuvers" (n ° 169) (x). It is this mentality that I wanted to enter the name " **The Nest Egg** " given to all notes and sub-notes (n ° s 168-169 s) relating to the first two among the "four operations" around my work.

(x) The end became the note "The Nest Egg" (n ° 169 (v)).

409 (*) (April 8) See, for correction, sub-notes already quoted "The pre-exhumation" (n ° 168 (iv)).

410 (***) As explained in Note b. p. Previous, the subject of this reference-thumb was not to be "understandable" or inform, but to induce (doubling) in error. In terms of affiliation ideas from patterns structures Hodge-Deligne (described in the two notes mentioned above), I have every reason to believe that I@ the only person in the world, to himself, who knows.

411 (***) Springer Verlag Lecture Notes in Mathematics, n ° 900, Hodge cycles, Motives, and Shimura varieties, P. Deligne, JS Milne, A. Ogus, KY Shih.

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rat race "and" Ownership and disregard "(n ° s 52, 59, 59 ©

In fact, not only all the main ideas of the volume LN 900 on the grounds were me known since the sixties (when Deligne has had every opportunity to learn through my mouth from 1965), but also the central problem of the book had been raised by me (and of course, communicated to Deligne) in the late sixties. For details on this, see the note "The dot the i" (n ° 164) (in part I thereof).

As I noted in the Introduction to Crops and Seeds (in "The End of a secret," p. Xviii)

Deligne was not the only one that I spoke out in detail the reasons yoga, even though he was the only to do his intimately. If there has been total retraction, for ten years 412 (*), existence even this yoga, and later the role was mine to discover and to develop and deepen, this retraction could be done with the connivance of many mathematicians that I was one my friends, and especially with that of each of my "cohomologistes students" (commutative) 413 (**). This retraction was done for the dubious "benefit" of one, but by the actions and omissions solidarity good number.

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Apart Deligne and my other cohomologistes students is the responsibility of the **co-authors** with Deligne p. 838 the "memorable volume" LN 900 seems to me the most heavily engaged, namely that of **TSMilne , A. Ogus** and **KY Shih** . These are mathematicians I do not know personally, and nothing allows me prejudge their dishonesty. For me, it does not take yet nothing in their sole responsibility as co-signatories of this unusual volume.

has 4. **The pre-exhumation**

Rating 168 (iv) (April 8) I was recently reported article Deligne "functions values L and periods integrals ", published in 1979 (Proceedings of Symposia in Pure Mathematics, Vol. 33 (1979), part 2, pp. 313-346) in the same volume as the article mentioned of RPLanglands "automorphic representations, Shimura varieties and motivated. Ein Marchen Corvallis "(pp. 205-246). The latter article (but not to Deligne) included in the annotated bibliography on the grounds that I had been sent in August Deligne last, and I was under the impression that it is in this article Langlands it is for the first and once question of motives in literature after I left, before the exhumation of 1982 (apart from the exposed Saavedra and Kleiman cited in the penultimate note below).

In fact, in the article cited Deligne figure a "Chapter 0" entitled "Patterns" introduced by "Recall there **part of formalism , due to Grothendieck** , motives "(my emphasis). The presentation given is such that it is clear that the general principle of construction that I had given to a category

412 (*) Based on an "annotated bibliography of reasons" that Deligne was kind enough to give me last August, there was still in the literature two sporadic work patterns after I left, the one and the other in 1972 (in the thesis N. Saavedra, prepared with me, and in a ratio of S. Kleiman). The next reference, due to Langlands, ranks in 1979. Following is LN 900 in 1982. I understand the word "pattern" does not appear in any published text of Deligne, between 1970 and 1982 -

nor does it alludes, in a text published (except at most of the biographical note discussed in Notes n ° s 165,166) to the fact that he could learn something from my mouth. . .

(April 8) About the "I believe", see correction in the sub-note "Pre-exhumation" (n ° 168 (iv)).

413 (**) I think I can say that all my students before 1970, with the exception of Ms. Sinh (who was not there, but working in Vietnam) were aware (without necessarily having similar) my thoughts on the grounds, on which I also made a series of explanatory statements to IHES (in 1967). Those among them who remained connected to the theme cohomology of algebraic varieties seem so supportive of the funeral held yoga reasons, on the initiative of the main "interested" Deligne. This is especially here JL Verdier Illusie L. and P. Berthelot, who have more each reported more actively than a simple collusion in some other three "operations" which it will be question.

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patterns (semi-simple, it is implied) on a body, was multivalent - also in section 0.6 it is stated that " **one of the definitions** units of Grothendieck is obtained by...". In this respect, the presentation is So honest. It is true that the part of "yoga" reasons exposed here is the most basic part, virtually existed in the literature (in exposed Manin, Demazure, Kleiman, Saavedra), and where my paternity

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was therefore particularly notorious. (It would seem that the retraction against my person
p. 839

- and that of Serre - in yoga weights, and later in the motivic Galois group, has passed without hitch. . .)

As I have had occasion to point out already (in the note "Climbing (2)", n ° 174), it seems that there had, after provisional culmination of "Burial operation" in 1977 (with the operation "SGA 4 1

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- SGA 5

), A relative calm until the" apotheosis "of the Symposium Pervert in 1981, which marks the end Symposium any hint of restraint in the dismemberment of a corpse. (See note "The Apotheosis", n ° 171.) Section Deligne, visibly under the sign of this lull. I guess the interest of Langlands motivic yoga had forced his hand eventually "spill the beans" (already stale) units, a Yet that moment psychologically was not yet ripe to move simply as mention the name of the deceased. There has been, in the three short years that followed, a "climbing" striking indeed (in the words of the note "maneuvers" that follows it), between the timid "pre-exhumation "reasons, and the" exhumation big bands "that took place with the" memorable volume "LN 900 in 1982.

(22 April) (mini) discovery discussed in the preceding page was continued and amplified considerable ably in the days that followed. I have indeed learned of the cited article of RPLanglands and and above all the next day, the "sixth nail" in my coffin 414 (*), taking the form of the book (my former student) Neantro Rivano Saavedra, who named "tannakiennes Categories". So there is still a substantial "rest of the story" (from "Reasons the operation"), I developed the following sub-ratings (n ° s 175 1 175 7) grouped under the name that was needed, "The Sixth nail (in the coffin)." It seemed better to REN-voyer that following the end of the investigation "The four operations" as new facts emerged all over the latter, especially in the note "The Apotheosis" (n ° 171), and four subscores 415 (**), appear to me essential to properly locate this "more" and give it meaning.

18.5.2.2. The maneuvers ("Cohomology spread")

b 1 . Context "Weil conjectures"

Rating 169 (i)

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(27 February) I come to the second of the "major operations":

p. 840

II Operation "Cohomology spreads." As for the reasons, it will be helpful to first place in some words context.

The idea of the existence of a theory of "cohomology" of an algebraic variety over an arbitrary field k , which associate with such a wide variety (at least if it is smooth projective) of "cohomology spaces" whose body coefficients would be zero characteristic (eg, a p -adic field), which the pro-calqueraient properties well-known properties of the cohomology "Betti" (defined by transcendent see 414 (*) This is the sixth of "nails" in the order of their discovery, but the first of six, seen in chronological order they were "posed" sensitively by my friend Peter, with included patented material (for the service of science) in Company Funeral familiar Springer Verlag GmbH (Funeral Service "Lecture Notes in Mathematics"). . .

415 (**) (11 May) Since these lines were written, the note quoted split into four separate notes (n ° s 171 (i) to (iv)) and plus eight subscores (n ° s 171 (v) to (xii)).

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when the main body is the field of complex) - the idea is "between the lines" in the Statement of famous conjectures of Weil (1949). It was in cohomological terms, in any case, as explained to me Serre the Weil conjectures, around the year 1955 - and it was only in these terms that they were likely to m © "Cling" indeed.

No one then had any idea how to define such cohomology, and I@ not sure nobody but me and Serre, even if it is Weil, had just firmly believe that it must exist. We had a good direct geometric taken as H_1 via the theory of varieties Albanian and points of finite order (developed by Weil), and through varieties of Albanese or associated Picard to a non-singular projective algebraic variety. This construction of the H_1 suggested that body coefficients "natural" to be the body l -adic Q_1 for the first number **distinct** from the characteristic. For equal to the feature (when it is not zero), the partial results of Serre probative especially in the case of **curves** algebraic, suggested we should be able to take as the basic body the fraction of the ring of Witt vectors k (assumed to be perfect). So we could expect that there have an l -adic theory (with grain of salt for $= p$) for **any** prime l - and in a sense PROP-nable, they were "all give the same result." Finally, when k has characteristic zero, so that has (at least in the case X nonsingular projective) cohomology spaces Hodge (which made sense for any k , since the introduction of Serre cohomology theory "coherent" algebraic varieties) and those of De Rham (which I introduced in inspiring me to cohomology From Rham differentiable), they provided immediate cohomological theories with all pro-

properties

required ⁴¹⁶ (*), and they were still giving "the same result" as hypothetical cohomologies ^{p. 841} l -adic.

These questions were at the center of my thoughts and my mathematical work published and unpublished, between 1955 and 1970 (year of my departure from the mathematical scene). If we put aside my work coherent cohomology (formalism of "six operations" formula Riemann-Roch-Grothendieck), we can say roughly that much of my work was to cohomological clear answers, or major lines answers to these questions. In view of at least Weil conjectures, acting as the main source of inspiration, my reflection on the theme cohomological materialized in four large **currents**, or "**son**", closely entwined to form an even and wide frame.

LAN 1 - I developed (with the assistance of employees ⁴¹⁷ (**)), a formalism of **cohomology** the - **adic** diagrams, for the first to residual characteristics, with all the known properties (And beyond ...) cohomology "discreet" familiar topological spaces. Three open questions nearly ⁴¹⁸ (***), technical, we can say we had "in principle" in 1963 and "in fact" from 1965 to 1966 ⁴¹⁶ (*) I was especially developed since the 50s formalism cohomology classes (Hodge and De Rham) associated an algebraic cycle.

⁴¹⁷ (**) The main contributor to the development of the formalism of étale Artin was. adaptations l -adic developed in the thesis of my ex-pupil P. Jouanolou (which unfortunately did not bother to pub-ram, I@e never held hands, and became not found). I think give details about the development of étale in "historical" account comments I join the Sketch Theme (to Reflections appear in the following R and S).

⁴¹⁸ (***) These three "open questions" are:

a. The "cohomological purity conjecture" (v spreads) for regular subscheme Y of a regular pattern X . Statement relevant is proven when X and Y are both smooth on a regular basic pattern S (sufficient for most cases applications) and also (by Artin, using fully the resolution of singularities) if X is excellent characteristic zero.

b. More serious still is the question of the validity of the **finiteness theorem** for $R_i f^*$ to separate f morphism of finite type noetherian schemes (excellent if necessary) when f was **not** supposed to own. We need this result to define f^* (and two others among the "six operations") as part of l -adic "buildable". I proved the result of finite means ⁶⁷⁵

(with the

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developments seminar SGA 5, following SGA 4 in 1963/64), a **complete mastery**

p. 842

This cohomology, within the general framework of the cohomology called "spreads" - in the form of formalism duality of "six operations". The principle of the definition of étale dates back to 1958, and I proven "Key outcomes" necessary and sufficient to complete the formalities (including theorems Type "weak Lefschetz" and notions of cohomological depth in the context spreads) in February and March 1963.

Over 2 . With yoga of **reasons** , I discovered **the** philosophy that links together the various l-adic cohomology (and others) of a variety, as many "achievements" of a different "pattern" which is common to all and is the "motivic cohomology" of this variety. This philosophy takes born in the early sixties, with a "Yoga weight" directly inspired by Weil conjectures (And an idea of Serre inspired by them, on a notion of "virtual Betti numbers" associated with an algebraic variety ⁴¹⁹ (*)). It is enriched in 1964 in momentum starting the l-adic cohomology, the crucial concept of "motivic Galois group."

Wire 3 . Inspired Monsky-Washnitzer ideas, who had built a cohomology theory (in constant coefficients) "p-adic" for algebraic varieties **smooth** and **affine** coach. $p > 0$, I cleared in 1968 a general definition for "cohomology" p-adic "I also called **cohomology crystals talline** ⁴²⁰ (**). This

0 theory was supposed to encompass "coefficients" (called "crystalline") not necessarily p. 843

constant or locally constant, and lead to formalism "six operations" as theory l-adic. He was acquired from the outset, at least, for varieties **smooth** , this cohomology has relationships was expected with the De Rham cohomology, and it generalizes Monsky Washnitzer- ⁴²¹ (*). singularities resolution assumptions and "cohomological purity" (cf.a)), which currently apply **not** to algebraic varieties since. $p > 0$. I, however, that under the torsion coefficients (as opposed coefficients l-adic), the formalism of the duality of six operations (ie including the Poincaré duality) was established by me in 1963 without finiteness conditions. This meant for example the "finitude" for H_i with constant coefficients or locally constant (torsional or l-adic) for a smooth pattern (not necessarily own) on an algebraically closed.

c. Validity of "dibualité theorem" on a regular pattern excellent. Situation similar to b).

The situation has improved significantly, the elegant proof by Deligne (in 1973?) The finiteness theorem for a type morphism of schemes over S system on a regular size ≤ 1 . This case covers the greater part of the applications (Algebraic patterns on a body type schemes over Z in particular). In the same situation a X-type pattern finished on a regular scheme of dimension 1, and similar simple arguments, Deligne also manages to prove bidualité theorem.

⁴¹⁹ (*) See in this regard the sub-grade $n \circ 46$ to Note "My orphans" ($n \circ 46$).

⁴²⁰ (**) This terminology is now (and long) time-honored, and the phrase "crystalline site." The two new ideas (compared to Monsky and Washnitzer) that led me to this theory, is that of **crystal** (Modules etc.), related to an idea of "growth" at the top of "thickening" (infinitesimal particular) a scheme of Initially, on the other hand the introduction of a structure of **power divided** in ideals increase thickenings envisaged, so as to ensure the validity of a "lemma formal Poincaré" (in divided powers). With these two ingredients, De Rham cohomology of a smooth scheme over k is interpreted as the cohomology "ordinary", with **coefficients in the structural beam of rings** , a "crystalline site" suitable.

Strangely enough, the crucial intuition crystal (like that, with a broader scope, topos) seems to have been left to account for my students, and the thread (omnipresent in my thoughts cohomological) of "six operations". This, I think, the main reason for the unfortunate stagnation that found in crystalline cohomology my departure, and also in the theory (closely related) called "Hodge-Deligne," since the first start-up force the one and the other.

It also seems at least plausible, if not obvious, that in one and the other direction, philosophy developed (in general indifference...) by **Zoghman Mebkhout** would have a key role to play. But his suggestions shy tions in this direction (to Berthelot in 1978) fell visibly deaf ears, coming from an insignificant character. . .

⁴²¹ (*) The thesis P.Berthelot, taking as a starting point my ideas in provides additional justification, establishing a duality formalism for clean and smooth varieties, rich enough at least to write an expression 676

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Wire 4. The unifying geometric concept, connecting by intuition "topological" common cohomology p. 844 spreads and its immediate variations (related topologies Zariski, fpqc, fppf etc.), crystalline cohomology, and finally cohomology "Betti" defined in the transcendental context, and (more generally) the cohomology sheaf of arbitrary topological spaces, is the term " **website** " and, beyond celle-one, more intrinsic and more hidden, that of **topo** . This one, from 1964 and onwards, just gradually to the front of the stage. I speak about the scope of this concept, central to my work, now banished from the geometry in the note "My orphans" ($n \circ 46$), pp. 180-182, which I confine myself here to extract the following passage:

"This pair of concepts [schemas, and topos] potentially contains a renewal wide scale both algebraic geometry and arithmetic, that of topology,

a synthesis of these "worlds", too long separated in a geometric intuition commune. " 422 (*)

The language of the topos and the formalism of étale, are developed in both consecutive Seminars and inseparable SGA 4 (in 1963/64) and APG 5 (1965/66) 423 (**). The first is made in collaboration with

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other 424 (*), and develops, in addition to the language of the topos, the results cohomology spreads, including key-statements start duality (style six operations). The second, which I did virtually alone 425 (**), develops much more detail a complete formalism

Cohomological **crystal** for the ordinary function L of such a variety over a finite field. But, as I point out in the Note b. p. Previous, it is far, even today, a Masters comparable to the one we have in cohomology l -adic, which would be expressed by a formalism of "six operations" for "crystalline coefficients" generals. These (whichever as I said in Deligne lately) have not only been **defined** yet at present, nor indeed that good "Hodge coefficients" (above complex algebraic varieties)! For a few comments about the "problem coefficients", crucial to me for an understanding of the cohomology of algebraic varieties, see note "The melody the grave - or sufficiency" ($n \circ 167$) This issue was clearly there for me throughout the sixties, but was buried (among many others, and the care of my students cohomologists) until today. . . (April 23) See also the note about "The tour of building sites - or tools and vision", $n \circ 178$.

422 (*) I suggest elsewhere (in the sub-grade $n \circ 136$ 1 to Note "Yin Servant (2) - or generosity" ($n \circ 136$), to call the name of **arithmetic geometry** this "new science" still in its infancy, "so vast that until today had I not thought of giving it a name, "born in the early sixties in the wake of the Weil conjectures, whose" yoga motives "is" like the soul, or at least as a sensitive part of all. "By the name, I would suggest "The image of a" geometry "which can develop" above the absolute basis "Spec z , and which admits of" specialized tions "in both the" algebraic geometry "Traditional different characteristics than notions geometric "transcendental" (above the main body $C, R, \text{ or } Q$...), via the concepts of "varieties" (or better, of **multiplicities**) analytical or rigid-analytic, and variants thereof.

(Loc. Cit. P. 637). I write above (same page):

"Beyond the building of the new algebraic geometry, and through to the" control of étale " (And that of l -adic cohomology ensuing) is developing an architect of this new science still evolving, that was for me my main contributions to mathematical my time. "

423 (**) A second edition (in three volumes) SGA 4, completely revised compared to the original edition (especially in concerns language sites and guidebooks, and categorical supplements) was published in Lecture Notes (Springer Verlag) in 1972-73, $n \circ s$ 269, 270, 305. To the vicissitudes of SGA 5, see the details given below. A "Illusie edition" of Version copiously dismantled the original seminar was published in the same Lecture Notes (No. 589) in 1977, **eleven years after** the end of the oral seminar.

424 (*) Language development sites and topos, from my initial idea in 1958, has been mainly spurred and with the help of M. Artin, J. Giraud, JL Verdier. See for details the promised historical commentary, cited in Previous note b. p.

425 (**) The only exception (if my memory is correct) is supplied by JPSerre who made some beautiful presentations on groups finished and Serre-Swan module associated with the driver Artin, I needed to develop the formula General fixed points I had in view. It was expected that such statements be included in SGA 5, but seeing the turn events were taking, Greenhouse has had the good sense to put them available to the mathematical public by posting them elsewhere.

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duality, including formulas of fixed points leading to the cohomological theory of L -functions (which is an important part of all Weil conjectures). I speak about this double seminar in note (n "The body..." $\circ 88$), as follows:

"The set of two consecutive seminars SGA SGA 4 and 5 (which for me are like **one** "Seminar") develops from nothing, both powerful tool for synthesis and discovered green that represents the **language** of the topos, and **the tool** fully developed, efficiency par-made, what the étale - better understood in its essential formal properties, from this time, than was even cohomological theory of ordinary spaces. This set represents the deepest and most innovative contribution that I have made in mathematics, at a fully completed work. At the same time, and without wanting to be, then at every moment everything is going the natural obvious things, this work represents the "tour de force" the largest technical that I have accomplished in my work of mathematician. Both seminars are for me inextricably linked. They represent, in their unity, After the **vision**, and **the tool** - the topos, and a complete formalism of étale. While the vision remains challenged today, the tool for over twenty years profoundly renewed algebraic geometry in its aspect for me the most fascinating of all - the "arithmetic" aspect apprehended by intuition and by a conceptual and technical background,

of "geometric" in nature. "

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b 2 . The four maneuvers

Note 169 (ii)

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The operation " Cohomology spreads " was to **discredit the vision** unifying topos

p. 846

(Such as "nonsense" the bombinage etc.), and thereby also by assimilation and the role that had been mine in the discovery and development of cohomological tool; and on the other hand, **to appropriate the tool** , ie the **paternity** of ideas, techniques and results I had developed on the theme of étale. Again, the "beneficiary" of the operation is Deligne ⁴²⁶ (*), and this is his ascendancy exceptional (probably due both to its exceptional resources, that its implied status of "heir" of my work) who made "pass" an operation of this scale (of débinage and ownership) without apparently doing a wrinkle. . .

This is also in 1965/66, in the oral seminar SGA 5 and precisely by the already written text component

Previous SGA 4, the young newcomer Deligne made his first training, both theory

diagrams of homological algebra (Grothendieck style) and new techniques of cohomology

spreads (born two years before) ⁴²⁷ (**) - so techniques that have been the basis of all his subsequent work.

For all other presentations, I was the only speaker, or if there were other towards the end, they followed the detailed notes

I had developed for the seminar. The task of editors (sic) therefore merely putting straight the notes I had available to them.

⁴²⁶ (*) There are however substantial benefits for **Verdier** , as we will see later: first in 1976, when he gives

the "kick" for the dismantling of SGA 5 with his "memorable article" (see below the "Episode 3" of escalation)

and then in 1981 at the "Symposium Pervert" (which will be first question on this in the note "Sharing" (n ° 170) devoted to "Operation III").

⁴²⁷ (**) This is what I recall to my memory (having almost forgotten) in Note (May 27 last year) "Being apart" (n °

67) © I would add that it is in the same seminar that the young SGA 5 Deligne also learned, in my contact (but "as 678

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In the operation (I have elsewhere called the "SGA operation 4 1

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- APG 5 ") mounted by my brilliant f

student, I discern four " **maneuvers** " inseparable.

Maneuver 1. Discrediting the mother seminar

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SGA 4 - 5 SGA as a "matrix of nonsense" and other ^{p. 847}

kindness of the same water: this is done by the band (and "casually") in the various introductory texts

the volume of the pen Deligne, called the strange name "SGA 4 1

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"(Subtitle: Cohomology spreads) appeared

Lecture Notes in Mathematics of n ° 569 (Springer-Verlag). See for details on the shape débinage

double seminar SGA 4 - 5 SGA where Deligne learned his trade and found his basic tool for all

his later work, the note "The clean slate" (n ° 67).

2. Maneuver Sabotaging a writing all of my oral presentations SGA 5 ⁴²⁸ (*). Normally

it should have been made within a reasonable time (a year or two at most), through the (failing

other reliable authors-volunteers) cohomologistes of my students, who had the privilege of belonging there

take a good part of their work, along with ideas and techniques they have been for

many years with other listeners of the seminar, the only ones who know. It was also the best

way (and quickest) for them to become familiar with a substance and with ideas and techniques,

during oral presentations tended to their spending a little "over the head" (with the exception of always

dashing Deligne, it goes without saying). Still this writing, or rather **non-drafting** has fina-

LEMENT **dragged eleven years** - until the moment (coincidentally) where Deligne gives "green light" to

Illusie to care at the end of the purposes of writing and publication of this unfortunate SGA until 5

there left behind by agreement - the moment when it is acquired it will be published (in 1977)

after a certain amount of his own pen one, compound (in 1973 and subsequent years) to first

needs (at least I had first grown understand) a popularization of "ingredients" ("inputs") of

étale essential to his argument (the last part) of the Weil conjectures, is baptized

for the occasion of the unusual name "SGA 4 1

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. "(The name seems to have yet to date have not yet
aback or surprised, even

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shocked, nobody except me ... (169 1) 429 (*)) For details, see notes p. 848

"Green light" and "reversal" (n ° s 68, 68 ☹ where the sense of volume naming "APG 4 1

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" begins to

show me, and notes "Silence" and "solidarity" (n ° s 84, 85).

Maneuver 3. Dismantle the original seminar SGA 5, the published version (for the "care" of my
Former student Luc Illusie) represents only a "body" outrageously mutilated. I go around this
shameless dismantling, or rather, the **slaughter** of which was given a splendid seminar
the hands of my students, in the note of the same name (n ° 87) - one of the longest and most revealing of
thinking about the burial.

4. Maneuver break the unity of my work on the étale, work represented by
the two parts 4 and inseparable APG APG 5, in the "bisecting", "violent by inserting between the
if he had always known, "it must be said!) the art of putting black on white the description (or" theory ") and a nested position
at first thick, in a form which is both convenient, striking, clear and accurate. This does not prevent,
Twelve years later, having put his hand to ransack the seminar, view vis-à-vis what remained (and SGA component
4 which forms the seat) of contemptuous patronize tunes and disregard.

428 (*) As I noted three notes (b. P.) Above, there have been detailed notes for each of my oral presentations. Their

Writing to the net would have been for me a work of a few months. If I did not, and in the year (1966)

the end of the seminar, it was because in principle voluntary (???) had undertaken a detailed drafting. This has
dragged on until I left again in 1970, when I entirely "hook" to such questions

for tasks that appeared to me (rightly) more essential and urgent. On this subject the note "Green light" (n °

68) I wonder for the first time on the meaning of what happened with "that unfortunate seminar". It was April 27
- and I discovered the reality, the "breath" of the "massacre" on May 12, two weeks later. . .

429 (*) See in this regard, and for clarification of the **meaning** original and true acronym AMS (including my name and person
ended up being ousted) sub-note "Eviction" (n ° 169 1 which follows it ("The maneuvers" n ° 169), and was also
originally scheduled as a mark of b. p. same here.

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two shutters, and a foreign contemptuous text " 430 (**), responsive to unusual name" APG 4 1

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" 431 (***)).

This great name says what it is supposed to say - all were thinking about it! By name alone already, this volume
present as **the** central and fundamental text on the étale, intended to **replace** the "exposed
bushy SGA and SGA 4 5 ", " we may consider a series of digressions, "including" some very
interesting "it is true, but the central text" should allow the user to forget. "

It is not necessary also my former student and friend brilliant compromise here long and unnecessary
speech: name alone lapidary "SGA 4 1

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states and poses unanswerable evidence of a **prior** of this

p. 849

text compared to "digressions" named SGA 5 (which, as it could certainly be otherwise,
have indeed been published after him. . .), And at the same time as she poses as evidence an (alleged)
logical dependency SGA 5 with the text "previous".

This incredible imposture of a so-called logical dependency SGA 5 from the text apo
cryphe is indeed affirmed in the introduction to this 432 (*), where the author announces stride (and
nobody before me apparently - having these days - there is nothing special. . .):

"... His life [that of" SGA 4 1

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"] Will publish soon SGA 5 **as is** " (ie
my emphasis) -

read: in the state of a **body** ransacked and looted copiously. . . As yet I had knowledge
for more than a week of the operation "Patterns" My friend, it took me two days (April 26, with the
note "clean slate", at 28, with the note "Reversal" (notes n ° s 67, 68 ☹) to arrive to grasp the meaning of
this "mystery" that meant to me that obviously absurd assertion of my brilliant student - and
understand also, at the same time, the sense of seemingly innocuous acronym "SGA 4 1

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"On which I myself

not yet arrested the two previous days.

The same sham of "logical dependence" is clearly suggested in the introduction to APG by 5 Illusie (169 2) 433 (**). It is made more plausible for an unprejudiced reader, by the countless References to "APG 4 1

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"Which later writers exposed my 434 (***) (or those of

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least, we well

p. 850

wanted to include in the edition-killing) are longer to cram their newsrooms. Many of these references are also no references cage, but refer to two presentations of original seminar

(written by one Illusie, the other - particularly crucial - by Deligne 435 (*)), which were incorporated without further

430 (**). This passage is quoted in quotes (memory) of the note "the remains..." (N ° 88) - the same one where, for the first time in thinking about the burial, I "ask" to finally realize the place of the seminar 4 LMS - LMS 5 at

"Inside my work fully completed." As deep lived, "carnal", the "breath of violence" is in

taking to this central part, harmonious living of my work, it is revealed to me in a dream the same night following the reflection. He finds his written the next phrase in the note "... And body" (n ° 89).

431 (***) Subtitle: Cohomology spreads - Pierre Deligne. . . The caption also told what he means!

432 (*) I recall that Deligne also confirmed to me verbally, during his last visit home (last October), this

even delirious thesis - no real belief it is true, and without pretending to tell me what my seminar, which formed

a harmonious and coherent without having waited, depend on the work of Deligne made from it seven years later. . . This short scene on a train platform, where we waited (with her little daughter Natasha) the train that was to take them to Paris, told at the end of the note on this visit, "The accomplishment - or the moment of truth" (n ° 163).

433 (**). For details, see sub-note "Good Samaritans" (n ° 169 2) to this note (n ° 169), originally scheduled as a note of b. p. same here.

434 (***) (April 9) made detailed audit, "late editors" in question (and this is an understatement...) Are limited to

dear former students Luc Illusie and Jean-Pierre Jouanolou. The editorial Bucur and Houzel were ready even before my start, and did not push Illusie servility to slip references to a text called "SGA 4 1

2 "which has emerged

a decade later. He and Jouanolou were content to wait for the "encouragement" to write Deligne

which was up to them, eleven years after the completion of the seminar and for the presentations they had written "my time" to cram the cage references to the text-pirate their brilliant friend and protector.

435 (*) This is the exhibition "The cohomology class associated with a cycle, by A. Grothendieck, written by P. Deligne". It is specified moreover that this presentation was "inspired notes Grothendieck, which **formed a 0 state SGA 5 IV**" - whereby it is suggested, 680

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ado in the volume named "SGA 4 1

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"- taking care not to ask me anything or just

let me know, but as something that (in the absence of the late master) they belong right. . .

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This act of brigandage allows more to my former student Deligne to reach this brilliant **reversal** p. 851

roles , to present me on the cover of the book (and in keeping as much to consult me ...)

as his **collaborator** (for the development of étale!) 436 (*) - a bit collaborator

"confused" at the edges 437 (**). It is true, but "collaborator" anyway. . .

As for the text-pirate called "SGA 4 1

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"Besides the two already mentioned exposed, torn from their context

original SGA 5, and also many "digests" of some of the results of USG 4 - 5 particularly SGA

important for arithmetic applications, plus one original chapter of applications are trigo-

nométriques, and apart from finally "State 0" from the "thesis" -SiC Verdier (which will be discussed further with

"operation III"), it consists of a handful of supplements (useful, certainly 438 (***)) to formalism cohomology

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SGA in developed 4 - SGA 5. This would be enough for a beautiful article, a bit eclectic, p. 852

thirty pages (or fifty, by including the chapter "Are trigonometric"). In

no doubt that this is an act of charity we rid SGA 5 of this sad state (zero), to make the statement that this beautiful in a bright volume. . .

As for the statement which had undertaken Illusie (former Chapter II), disappeared SGA 5 to reappear (as refurbished)

as an appendage to the presentation of Deligne theorems finiteness in étale he developed theorems

finitude relevant for $R_i f_*$ (under assumptions of "purity" and "resolution", see note b. p. (***) page 841), and

theorems like "generic Künneth" and "local generic acyclicity". No one before me had ever thought of **formulating** Only such statements in cohomology In addition, so-called demonstrations "outdated" oral seminar, in addition to dependence principles (for p. ex. to derive a finite statement for the functor Rf_* the similar statement for Lf_* and $Rhom(\cdot, \cdot)$), introduced a technique uniform use of the strong form (at Hironaka) of the resolution of singularities, which has been proven elsewhere - and it is there and nowhere else that Deligne and my other students cohomologues have learned. She served thereafter, especially in my proof of the theorem "De Rham algebraic" for smooth varieties over the field of complex, and that of the theorem Mebkhout-the-name-named, said "theorem Riemann Hilbert "alias" theorem of God "(which Mebkhout has not yet had the benefit of learning the method in SGA 5 she was gone. . .).

Seven years later (?) Deligne is an elegant method to prove in a few pages the finiteness of f_* and bidualité the theorem (technically very close), under assumptions (if not optimal, at least) little restrictive (see Note b. p. cited). Nothing, either in the statement of Deligne or in the Appendix to his friend could do suspect the reader I am for something in the concepts introduced and used (eg local acyclicity and its variant "Generic"), or in the forward-proven (finiteness of bidualité and Künneth and generic acyclicity), and the links between them. My name missing from both the text, that the bibliography, which consists of four references to Deligne, all occurred since 1970 ie my "start".

I find myself there again, at the turn of this note b. p. Explanatory before deliberation to Clean slate© the source and root of what my brightest students handle with such mastery (as if they had always known. . .) - that is to say the one to **erase the traces of the past**, the past before my "death".

(16 March) For the special role reserved for supplements "finitude" Deligne, see sub-note "Trojan Horse" (n° 169 3) to this note "maneuvers".

436 (*) This staging (where I appear as a "collaborator" of my student Deligne) is even more brazen, it was seven years I had clearly and publicly signified my intention not to publish math (much less, therefore, to As a "collaborator," one might think. . .).

437 (**) In his summary (he sent me a copy) of "SGA 4 I

2 "for the Zentralblatt (in September 1977), is a Deligne

happy to talk about the "state **confused** - although rigorous - SGA 5" (my emphasis), which (one would have suspected) the new text was supposed to "cure". . .

438 (***) These are the results of finitude (already mentioned three notes of b. P. Above and in the cited therein), filling in a few pages of the two gaps mother seminar SGA 5, plus a discussion of the formulas fixed points "modulo" the n and p . The problem to explain such formulas, and relevant conjecture for an expression mod p of the function L Artin-Weil for a finitely scheme on a finite body had been laid by me from the seminar SGA 5, and were surely part problems (unworthy of any mention in the introduction of Illusie GAS 5) posed in the presentation of closing (exposed disappeared

body well, with many others, in publishing-Illusie). Deligne had found a common solution to a large elegance, using the "formula Künneth symmetrical" (it develops, for the purposes of the case, in presentations spurious in SGA 4). He had heard something (and obvious) that these results would be included in the written version of SGA 5, they were directly inspired. It is hardly necessary to state that in the presentation (eight pages) devoted this formula in the said volume "APG 4 I

2, "my name is not pronounced.

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provisions so little decent in my former student shining, it would be self went to include these few supplements, each in its place, in the two or three presentations SGA 5 they were inspired and they completed. Instead, they serve as a pretext for the complete abolition of the presentation II APG 5 (with the blessing of Illusie, which was responsible for writing and y "makes up", transforming this presentation in an appendix in "SGA4 I

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"Chapter on the theorems of finiteness), and also to rename

Dry the bidualité theorem in étale (I was released in 1963 on the model of similar

"Consistent" that I had discovered in the fifties) "Deligne theorem" (*) (as was said Deligne

also generously "give in" to his friend Verdier, four years later, as part of the "package" called

"Verdier duality." . .). 439

b 3 . **Episodes of escalation**

Rating 169 (iii)

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(169 (iii)) The operation "étale" continued throughout the eleven years from 1966

p. 853

in 1977 that elapse between the end of the seminar SGA 5 and publication, in quick succession, volume-blow-de-saw "SGA4 I

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"Followed by the publishing-killing (so-called "Illusie edition ") SGA 5 440 (*). It was fulfilled before all thanks to the joint participation by acts such omissions, my five students "cohomologistes":

P. Deligne, L. Illusie, JL. Verdier, JP Jouanolou, P. Berthelot 441 (**). It is the responsibility of Illusie 439 (*) The **bidualité theorem**, or "local duality theorem" (both names are those I had given him), both in the coherent context in the context "discrete" (spreads, in particular), is in the nature of a Poincaré duality theorem "Local" valid for "varieties" (algebraic or analytical, or "moderate" areas etc.) may have singularities any. This is a theorem of an entirely new type in the arsenal of the "basic facts" in cohomology spaces of all kinds, and it is an important and deep complement duality formalism said "six operations" I developed to express with maximum flexibility and generality all phenomena like "duality cohomological" (like Poincaré). It belongs with the introduction of the functor $Lf^!$ (the inverse image "unusual"), the main ideas innovative I have introduced in the duality formalism of varieties and spaces "of all kinds"; one and the other formed somehow the "soul" of all the yoga of "six operations".

In the coherent case, the demonstration of bidualité theorem is also trivial. This prevents that what I call without hesitation "deep theorem" because it provides a simple and profound vision of things that are not included without him. (See in this regard the observation of JHC Whitehead on "The snobbery of young people who believe that a theorem is trivial, because his argument is trivial, "observing that I take and on which I embroider in the note" The snobbery of young - or defenders of purity ", n ° 27.) In the discrete case, the proof is, too, deep, using all strength of the resolution of singularities of Hironaka.

Attribute authorship of such a theorem to Mr. X (Verdier first in this case, for analytical discrete case, Deligne then spreads to the discrete case, until the two friends agree to award all in one Verdier) under said Mr. pretext that was copied in a neighboring context already known demonstration, or he knew broaden conditions Provisional validity (which I released in 1963) - and without even find it useful to recall the origin, is what we called "My time" a scam. I still have to wait, in fact, that the purity and theorems are relevant resolution demonstrated, that (in étale) I could maybe again claim to paternity as at least the **Theorem bidualité** of (in the optimum setting, this time excellent circuit) - in a time when the major **key ideas** that inspire and give meaning to the theorems have become subject of general contempt.

(May 11) I said that the validity of bidualité formalism in the analytic case I was of course known since 1963 when Verdier has learned through my mouth. I have not failed in SGA 5 always meet in passing the area of validity ideas and techniques that I developed. In the edition-killing SGA 5 Illusie took care to remove all traces of Such comments.

440 (*) (March 12) It now appears to me incorrect to consider that the operation "Cohomology slack" would have ended in 1977 with this double publication "SGA 4 - SGA 5", which would be the "culmination" (as I write two paragraphs below). I am misled here by the deliberate (sometimes convenient but artificial) of wanting to "cut" operation "Burial" (the deceased master and its faithful) in four separate operations - while these are in fact inextricably linked. The truth "culmination", or rather the **apotheosis** of the operation "Cohomology slack" and together with all the Burial, held four years later at the Symposium (called " **Symposium Perverts** ") Luminy in June 1981 (which will be discussed especially with the "Transaction IV "). In this conference, where the cohomological formalism all directions (coherent and spreads) is at the center of general attention,

my name is not pronounced ...

441 (**) This solidarity is expressed, for each of these five former students, first by omission, by abstaining from any effort to help make available all a wide range of new ideas and basic techniques, whereby they

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(Apart from that of Deligne) which seems to me the most heavily engaged, since it was he who assumed Responsibility for the editing-killing, thus making the docile instrument

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Deligne 442 (*).

p. 854

The intention Deligne in the appropriation of the "real" father of the étale can do no doubt. It is attested by the spirit of the whole operation "étale" probably single in the history of our science. It also expresses, quietly at first in 1975, in note Biographical Deligne (where any reference to a cohomological tool I would have put into his hands, and could have played a role in his demonstration of the latest installment of the Weil conjectures 443 (**), is absent), and vividly eight years later, in the brief but eloquent set of texts (1983) I called by the name "Praise of Death" (three-part) 444 (***). They are examined with the care they deserve in both notes "praise Funèbre (1) - or compliments" and "praise Funèbre (2) - or force, and the halo" (n ° s 104, 105) (and resumed, in a more penetrating light in higher note "funeral yin (yang bury yin (4)) ", n ° 124). As for the "Praise "autobiographical (and no funeral) Deligne, I make the turn in the two notes "Requiem for wave skeleton" and "The profession of faith - or truth in the false"

(n ° s 165, 166) 445 (****)

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The operation culminated in 1977 446 (*), with the publication (in order binding) "SGA4 1

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(sic) - SGA p. 855

5 ". This is the culmination (provisional) of a long **climb** to eleven years in my funeral work and my person, each new stage is emboldened by the tacit encouragement found learned their craft and they were the first to qualify for the "launch", but they held for ten years to book exclusivity; and after 1976, by their **silence**, in the presence of very large transactions yet an Verdier (1976) and a Deligne (assisted by Illusie, the year after). Besides Deligne and Illusie Verdier has played an active role in the operation "Cohomology spreads", giving, with "good reference" (see "Episode 3" below), the "kick" to the dismantling SGA 5, showing his friends that definitely the time was ripe for large-scale operation that followed the year after no problem. As for Jouanolou, its active contribution was limited to " **follow suit** " in peppering with pleasure his presentations austerity references to the text-pirate, and doing his best to evade the composer of the theme changes that take place there with a mixed belief. . .

442 (*) Illusie also made the **gossip Verdier** , which covers the deception of the previous year by refraining from any referred, in the introduction to SGA 5 or elsewhere, to my lectures on homological formalism and that of the class of homology associated with a cycle.

443 (**) (March 12) Nor does it is alluded to in the text, nor (to my knowledge) in any other text of his pen, that a substantial part of these conjectures was already established by someone other than himself. On this subject the sub-note "" **The** "

Conjecture "(n ° 169 4) to this note" maneuvers ".

444 (***) In my reflection on the Burial, the meeting with the Funeral Eulogy on the same day (May 12 last year) where a picture of a massacre broke into my investigation, was an important moment. The long reflection "The key yin and yang "(which gives its name to the second part of the Burial) is triggered five months later by an" association of "unusual ideas, which emerged after the meeting. It was prompted by a deliberate (but certainly implied Yet big spread ...) of "role reversal" in both "portraits-minute" I had to look a little more near. . .

445 (****) For details of this autobiographical form, see also the last note of b. p. (dated 29 de-December) at the end of the note "The nerve in the nerve - or the dwarf and the giant" (n ° 148). This leaflet was published by the "National Fund

Scientific Research "(Belgium), rue d'@gmont 5, 1050 Brussels, on the occasion of the award of" Five Year Award "at Pierre Deligne in 1975.

In this autobiographical two-page note, as in portraits minute that constitute the "Praise of Death" the art of sleight-of-hand is exerted as much on "reasons" "as that of the l-adic cohomology. In both texts, written eight years apart, the focal point around which focused reflexes of ownership seems well be "the" Weil conjecture.

(March 12) Even more absolute and more definitive than in "texts - Praise" examined in four notes cited, the appropriation for bursts and spreads in the **Symposium Luminy** June 1981 (see note b. p. of that day, page 853, above). Or rather, an appropriation previously and symbolic **intent** , which previously had expressed in groping of maneuvers (encouraged by the quick support of some and the indifference of all), became when brilliant Symposium (at least in the unanimous consensus of all the brilliant mathematicians assembled this memorable occasion, and for the general euphoria) a **done deal** .

446 (*) (March 12) This is a "culmination" any provisional! View the first notes of b. p. dated today, in this same note "maneuvers" (p. 853).

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in the previous steps, the general indifference and apathy (when it's not a quick welcome...) vis-à-vis their questionable character. I mentioned some of these steps with the operation "Patterns" reviewed previously. I found three other episodes again, more directly related to the operation "Cohomology spreads" and that remains for me to review.

Episode 1 . It concerns the fate of some conjecture like " **Riemann-Roch discreet** " . I had introduced in 1966 during the oral seminar SGA 5, in the final presentation where I had cleared and discussed some number of open issues and unpublished conjecture. This presentation was lost with all hands in the édition-Illusie where no reference is made (and not without reason...) To the conjecture in question, nor indeed any Another of the many questions that were raised. Yet seven years after the seminar, the conjecture reappears in the analytical context from the pen of McPherson, without referring to any seminar SGA 5 (or a schematic context), and under the unusual name of "conjecture of Deligne-Grothendieck". he This is the well-known Article 447 (**) where McPherson proves this conjecture in the analytical context.

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During his visit last October, Deligne me said he had limited himself in 1972 to **communicate** such p. 856

How to McPherson my guess (he had learned with other listeners SGA 5, at the seminar oral). He said he was surprised the name given by McPherson, without bothering to write him about it to make it change course. On this subject the note "The dot the i" (n ° 164, Part II 1), and for further details about the conjecture itself, the long subnote n ° 87₁ to the note "The Massacre" (n ° 87)⁴⁴⁸ (*).

Episode 2. This is the SGA 7 vicissitudes seminar devoted to issues **monodromy in étale**, which was held under the initiative and the common management of Deligne and me, between 1967 and 1969. The ideas of departure and the overall design of the seminar were due to me, and Deligne was made several contributions, the most important being his demonstration of the Picard-Lefschetz formula in the context spreads. As SGA 5, writing oral presentations drags on for several years - it's a little repetition of the (early) scenario (non-) writing his unfortunate predecessor! The publication eventually occur anyway in 1972 and 1973 (in Lecture Notes n ° s 288, 340), through the Deligne, when I disappeared from the mathematical scene for three years. At his initiative, the seminar is **divided into two parts**, the first presented as directed by me, as directed by the second he and N. Katz (Katz which was simply a speaker among others, during the second year of seminar)⁴⁴⁹ (**).

In the first volume SGA 7 I appeared under my name, the detailed theory of vanishing cycles, I had made in a series of presentations opening the seminar is "sabred" a summary of twenty pages Deligne (the other presentations were written within a reasonable time, by myself and others Seminar participants). The volume II appeared under the common signature Deligne-Katz, and the share that I had taken in the development of key themes and findings is less than in the volume

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this share is always retracted. I elaborates on this in the note "Prelude to a
p. 857

Massacre" (where I try to identify the direction of the mini-operation SGA 7) and above in note" points the i" (Part II 5), n ° s 56, 164.

I will confine myself here to remind the biggest retraction. It transposing I made in context of étale, the cohomological theory "Lefschetz pencils" and "theorem

447 (**) MacPherson, Chern classes for singular algebraic varieties, Annals of Math. (2) 100, 1974, p. 423-432.

448 (*) This conjecture thus appear for the first time, in its original and complete form in Crops and Seeds only, and this nearly **twenty years** after I have recommended to the attention of my students. . .

449 (**) In the sense that I discern in this **cut**, no mathematical reason no basis, see Note "Prelude to a Massacre" (n ° 56) cited below, and also the sub-note" Eviction (2) "(n ° 169₁) to this note" maneuvers ".
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Irreducibility. "This transposition of classical results, proven (when they are well and truly proven...) by transcendent way, was (as often) nothing automatic. I remember having spent days if not a week. There is not, to my knowledge, on the other demonstration known to date for key facts, as I open then spectral sequences of shots and structure "well known "(I had determined in 1958) of the fundamental group" moderate "of an algebraic curve⁴⁵⁰ (*). This theory is contained in SGA 7 II, in a presentation Katz (exp. XVIII) and according to the notes I him had communicated. In the introduction to the volume, the theory of Lefschetz pencils is presented (with formula Picard-Lefschetz proved by Deligne) as one of the "key-results" Seminar, without no reference is made either to a role that I would have played in any of the themes developed in this volume. The only reference that I know in the literature, which appears so little for such a role the Lefschetz theory is a footnote terse and ambiguous page⁴⁵¹ (**) (after the title ("Brush Lefschetz ") Katz's presentation, and the author's name)" According to notes (brief) Grothendieck ". In the article Deligne "Conjecture Weil I" (169₄)⁴⁵² (***) appeared

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from the same year (1973) at p. 858

the "Publications Mathematics", this theory of Lefschetz pencils acts as an ingredient important technical of his demonstration of the Weil conjectures. In this article, Deligne is not mine yet to retract my role in the trace formula l-adic (which is another crucial ingredient of its demonstration, whose paternity was still too notorious in well informed circles)⁴⁵³ (*); by cons when it takes care of making the results of the theory of Lefschetz he is about to use, no reference is made to my person. He simply refer to the relevant papers SGA 7, and there unlikely that an unhappy player never go unearh the elusive footnote page of his friend Katz. . .

Episode 3. The last episode that I may be known in "climbing" is up in 1976, one year before the "culmination" operation with the "SGA 4₁

- 5 USG "This is the publication in Asterisk (n ° 36 (SMF)

p. 101-151) from an article by JL Verdier entitled "homology class associated with a cycle." Verdier was a cohomologistes my five students, and (as his friends) had attended the seminar SGA 5, taking wisely notes without realizing what he had embarked there. In the ten years that have passed since he finished (as his friends) with navigate. Still, in this article he takes a number ideas that I developed in the seminar in question, far and wide, "to listeners who for mercy, "around the bidualité theorem and especially around the formalism of homology classes and cohomology associated to a ring ⁴⁵⁴ (**). In this article, my name is not pronounced (except once, ⁴⁵⁰ (*) In the introduction to Katz's presentation will be cited, it looks elsewhere generously attribute this to my theorem Former student Michèle Raynaud, who was exposed in the seminar USG 1 of 1950/61.

⁴⁵¹ (**) This note is ambiguous because it is careful to assert paternity, which might as well be due (to failure to state the contrary) is the author of this paper XVIII, or other co-signer of the volume (such as the introduction this one also suggests the omission). Closely following notes ("Concept"!) Grothendieck means not not that there are several demonstrations (some earlier), of which he would have done me the honor of choose mine. It is there (as elsewhere still in the same volume) is a typical example of the style "go!" dear my friend Deligne, which obviously did school. . .

⁴⁵² (***) see sub-note "" **The** "" Conjecture "" (n ° 169 4), from a note b. page right here.

⁴⁵³ (*) From the following year, however, in his autobiographical notes (discussed in the two notes already mentioned, n ° s 165,166) Deligne

can not refuse satisfaction, all symbolic it is, to retract this role. It is true that this was a text in circulation very limited, perhaps no mathematician "in on it" has kept the hands except me. But three years later still, the volume named "SGA 4 ₁

² "destined to become a point of reference current, the same retraction (but implemented with a different fingering yet, given the circumstances. . .) Is mounted, this time for the benefit of a wider audience of "users" not cohomology specialists spreads. For disassembly of this deception led masterfully see subscores group "Formula" (n ° s 169 ₅ -169 ₈) to this note, and the two subscores that precede it, "Trojan Horse" and "" **The** " Conjecture "(n ° s 169 ₃ , 169 ₄).

⁴⁵⁴ (**) The idea of defining the **homologie** a schema (or "space" ...) as its hypercohomology values in a "complex 685

by way of a joke of a very special kind ...) and no reference

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is made at any

p. 859

SGA 5 seminar whose author could be heard. Details can be found in two notes "The good references "and" The Joke - (... always the same weight, no error) or "complex weight" " n ° s 82, 83.

It is from this "memorable article" the duality formalism on analytic spaces complex, for analytically constructible discrete coefficients, reproducing only one I varietur developed (in 1963 especially in SGA 5 in 1965/66) in the schematic context spreads became subreptisement the "Verdier duality" - until five years later (in the euphoria of the Colloquium Luminy June 1981) the same round of sleight also makes for duality spreads. But then I look (as I have just done with the episode of "memorable article" itself) on the **third** big operation, this time with Verdier as the primary (if not sole) "beneficiary" - operation he will be discussed below ⁴⁵⁵ (*).

b 4 . **The impudence**

Rating 169 (iv) This article Verdier threw me an unexpected light on the fate of the SGA 5 hands of some of those who were my students. He showed me what kind of "profit" they could found in the exclusivity they had knowledge of the ideas and techniques I had developed in SGA 5, for them before all others. He also showed me, without doubt, collusion and Solidarity cohomologistes all of my students with this kind of operation. By calling this article "Good reference," I had not grown so name it - it is now (as it was confirmed to me various sides) a standard reference text, no

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of them could certainly ignore. This is what ends

p. 860

win by me in the notes "Silence" and "solidarity" (n ° s 84.85). I knew I did not have to surprised that in publishing-Illusie of what was once the seminar SGA 5, no reference is made, no time to formalism of homology (and homology classes associated with cycles) that I would developed in this seminar - and there was no need to talk about, in fact, since (ten years later) her boyfriend Verdier had already responsible for providing the missing reference to the satisfaction ⁴⁵⁶ (*).

Dualising "suitable dates back to the fifties (in the coherent framework), and had been endorsed by me, with luxury details, as part spreads during the seminar SGA 5. The methods I had developed on the theme of the class cohomology (first) and homology (then) associated with a ring, from the second half of the fifties (in the coherent framework), which I have presented a summary (v spreads) in SGA 5, were "technical boilerplate" is applicable to both "coefficients" continuous (style Rham or Hodge) and as discrete in both the schematic framework analytical or differentiable (among others). The needs of such a theory were also among my main motivations to develop (from the fifties) formalism cohomology "racks" in a closed (with result Spectral useful "passage from local to global") intended to provide a "algebraic" equivalent to the classic (and elusive) "Tubular neighborhood" of a closed subspace. It is on this occasion also that I have developed for the first time (as in the context that coherent discrete) statements of the type "purity" and "semi-purity" Cohomological.

455 (*) See Notes "Sharing", n ° s 170 (i) - (iii).

456 (*) As for the variant **cohomology** (just touched upon in the article by Verdier, that Deligne refrains also quoted), it is awarded (as we saw) to Deligne. As I duly presented as author of the paper hacked by Deligne there had no major reason to shut the disappearance of SGA 5 of my papers on the subject. Illusie mentions "in passing" in the introduction of his pen, not the thing to be deemed worthy of an explanation (one before me and no one seems to be surprised, indeed. . .). On the contrary, in the second sentence of the introduction, it is very clear that "The **only significant changes** compared to the original version on the presentation II [finiteness theorems]" that is not reproduced, and the presentation III [Lefschetz formula "]"..." (my emphasis).

Given the limited and given the context, I do not have to wonder if my former student pretends not to see of **other** "significant changes"

in the living and harmonious body that I had once confided in his hands and those of my classmates, reduces body
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The "good reference" provided by Verdier, like the "memorable volume" dedicating the exhumation partial memorandum by Deligne, is for me the outright plagiarism. It is not yet even text called "APG 4 1

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" 457 (**). Some forms are still kept there, in style" thumb "rigor, which excels constantly **suggest** false, never (or almost ... (169 3) 458 (***)) will advance to the **say** in

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clear. My first encounter with "SGA 4 1

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"And with the particular shape what makes this style p. 861

(the depreciation disdainful 459 (*) is in the note "The clean slate" (n ° 67).

But the operation in question hits me especially, more than a banal plagiarism could do so, for some dimension in **impudence** . None of the other three operations reached in my eyes this dimension end 460 (**). And it affects me more strongly that none of the other three may be because more it me

key as an act of violence, as a massacre "for fun" a beautiful work I had conducted

term and in which I put myself entirely - intended, before all others, even those who

are later in the plunder, to make grazing their sufficiency, and (under the guise of good complexion

People fly high and exquisite company) come and spread a discreet and insolence of these tunes complacent

contempt 461 (***)).

b 5 . **the loot**

Rating (169 (v))

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(28 February) The two "operations" that I have to review, as the fourth p. 862

(Called "Symposium Perverts") which will be discussed below, were made with the participation or collusion

of many, for the "benefit" (it would seem) of one. This is a common striking three

editing-Illusie to the state of a deformed body! And this is just a "change" not "important", among many others, that

this **share** is two inseparable friends of "packets" of presentations that I had developed with infinite care: the part

awarded to Verdier has become, for a year already with the release of SGA 5, " **the** " good reference that everyone

waiting (Deligne dixit) and that Deligne awarded to becoming "the" good reason duly mention the indispensable basic text

"SGA4 1

2 "at every turn of the page, and in addition, to present their dead master as the humble (and confused) collaborator

his most brilliant student. . .

457 (**) (March 21) The reflection continued in the following subscores grouped under the name "Formula" (n ° s 169 5 to 169 8) me shown that this impression was wrong, despite "certain forms" that are still kept. . .

458 (***) On this subject the sub-note "Trojan Horse" (n ° 169 3), following a note b. p. here which was supposed to explain this "almost...."

459 (*) This is the "depreciation" affecting to wipe out the "ganguer nonsense" amassed by a predecessor "confused"

("Though rigorous...") And draft wishes. . .

460 (**) (March 11) This assessment is of course entirely subjective. In writing this line, I actually had as a hesitation, thinking of the unthinkable "operation" Symposium Pervers (or "IV operation", which will be still question). This memorable Symposium constitutes a veritable **apotheosis** collective of my person Funeral, by that of a rash follower (Zoghman Mebkhout) interposed. It was on this occasion that I realized that this apotheosis is also a **continuation** natural, and the ultimate **outcome** of the operation "Cohomology spreads", which episode "SGA4 1

2 - SGA 5 "was in reality a" culmination "any provisional In the latter, my former student Deligne do. can help here and there to do even referring to my humble self and my work, even against the heart, and to get stand by scornful epithets. In the Symposium Luminy June 1981 against where étale was at the center of public attention, my name (as well as that of the unknown service Zoghman Mebkhout) is at no pronounced now. . .

461 (***) This conceit and contempt spread out quite clearly in and between the lines of this book called "SGA 4 1 2 "(probably unique in this kind in the history of our science). They also appeared in the same year of publication of this (but in more muted tones) in the personal relationship of Pierre Deligne me. (See note "Both turning "n ° 66.) I found them in the casualness of such and such other among those who were my students, refraining from answer such a letter telling him about something that kept my heart or had pained me. I found them in keys light and casual, between the lines in the introduction to "Illusie edition" (or editing killing) of a labor of love, and also last year, in the condescending air paternal yet another student (referred to in the note "The joke - or "complex weight", "n ° 83).
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operations, from confirmation of continued reflection in the note "The Gravedigger - or the Congregation whole "(n ° 97).

But I see in the first two operations, made around the grounds and étale, a point more insidious common, about a **spirit** that animated them. This is a certain attitude Interior vis-a-vis the **possession of scientific information** of high level and limited traffic, or in extreme cases, a contained information to a group of several people linked by alliances of interest (or even a single person), and who use their power to **block traffic** as long as they seem advantageous to book in the "benefit" exclusive.

So, after my "start" in 1970, Deligne was **the only one** (except me) to be intimately assimilated the "yoga reasons "and to have felt the full scope. - to make use one knows my five students cohomologistes (Including Deligne), and maybe two or three other former auditors SGA 5 who had the perseverance to really assimilate the substance, were **the only ones** to have at their exclusive disposal and ideas techniques I had developed in this seminar.

In either case, speaking to Deligne in countless head-to-head between 1965 and 1969, or the small group of listeners SGA 5 in 1965/66, it is true that it is "for them before all other "I explicitais and was developing long before them some inner vision is not **not** as representatives of some "interest group" I was putting their hands these things had for me the price. To me it was obvious that I was speaking of them as animated people like me, next to the natural desire to give their evidence and make their contribution to a **knowledge common** mathematical things, by a **spirit of service** , vis-à-vis a "mathematical community" without boundaries in space or in time 462 (*).

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And what I was putting into their hands, I knew

p. 863

that these were not "curiosities" museum pieces, but living and burning things to do grow and branch out - and that was what was sensed immediately by those to whom I spoke 463 (*).

If I spoke to them, it was not as kind to the **shareholders** to whom I have entrusted shares at name I know not what "interest" common but as for **people** who connected me an **adventure common** - people, therefore, who would be keen to act as **relays** for the "information" that I was communicating to them (even do their part as they please, in the echoing around them ...), as myself I was doing over in their favor 464 (**).

With a decline of nearly twenty years I realized that there was between me and them a land misunderstanding - we were not "connected to the same waves." What I had confided as living things hands that I thought loving, was hoarded as a kind of **nest egg** that would hasten bury.

Possession of loot represented a certain **power** (admittedly ridiculous, considering the price...) - be it the authority to retain, to prevent (it was only for a time) a living thing, made to flourish and

462 (*) On the subject of such a "spirit of service", see in particular the note (also cited below) "Yin Servant, and new Masters "(n ° 135).

463 (*) (April 10) That did not stop some of them to do their best, afterwards, to run down what they have hoarded

long, having struggled initially (aside Deligne) to grasp the meaning and scope and to assimilate. I see this débîne tone (which surrajoute the attitude "nest egg", which is discussed below) double **compensation** . On the one hand the wicking malaise (created in their hearts by the diversion of something that is not theirs, but that of **all**), in pretending to **devalue** their own eyes what was hijacked. On the other hand there is vis-à-vis compensation "father" felt like incarnation of a creative force that exceeds the (then they get to take similar force, rests in them as in the one in which they secretly complain. . .). My state of "dead" and the example set by the heir Direct have created a favorable environment for "romp" a secret antagonism, the "father" is now felt to be in a **position of weakness, inferiority** .

464 (**) It is therefore this "mathematical community without borders" that I spoke, the same time as them and through them. I explained elsewhere (see note b. P. (*) Page 847) why I do not charge myself myself, from the year less ensuing seminar, to rewrite the net to put at the disposal of all.

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18.5. THE FOUR OPERATIONS (a corpse)

to swarm, swarming and flourish.

I tried to capture the two attitudes, different essence, that confront this "misunderstanding" 465 (***) in the two notes "Yin Servant,

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and the new masters "and" Yin Servant (2) - or generosity " p 864.

(n ° s 135, 136). I would not look here asking to copy incarnation of "service attitude" opposed to the "attitude of caste": one where "knowledge" is the hallmark of an elite and (to a stage more advanced in the degradation of morals) the average of an arbitrary power over others. As revealed reflection in Fatuité and Renewal (Part Crops and Seeds), the reality is more complex. I have seen in my own person, and some of my actions in my past of mathematical ticien, germs of the general degradation I see today. And it is also this virai " **Service drive** " in me has been a powerful engine of action, particularly in the development of my written mathematical work, especially in the tireless pursuit of the two series of texts foundations EGA and SGA 466 (*).

It seems that I have not known anything communicate to my students of this drive there, or the attitude that the reflects. The company work, since she embodied an attitude and provisions "service" a community, stopped dead after I left 467 (***) - as by a sudden blow

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saw (or p. 865

chain saw. . . 468 (*)).

By echoes still reach me here and there in the world I left, I see that this attitude spon-ous, I had in common with the benevolent elders who welcomed me when I first became (as the same benevolence) an **alien** in this world that was mine.

b 6 . **eviction**

Rating 169 1

(March 9) 469 (***) The sign LMS is an abbreviation for "Seminar Algebraic Geometry Wood Mary. "It refers to (or at least pointed in the sixties) seminars where

I developed between 1950 and 1969 (in collaboration with students and others from 1962) my program foundations of the new algebraic geometry, along with texts (under "Advanced"

465 (***) In writing these lines, and the word "misunderstanding", the association came to me with the letter Zoghman Mebkhout (cited in note "Failed an education - or creation and conceit", n ° 44 ©) which spoke of "a kind of misunderstanding" between my students and I (in yet setting aside Deligne...). I was not sure then that I understood what "kind of incomprehensible hension "he meant Is this the same as this." misunderstanding "I am talking about here - and it would have excluded Deligne by his

deliberate (which surprised me more than once in my friend) not seen that "pink"?

466 (*) The "relentless pursuit" was also often against another equally strong drive in me that to release all the "tasks" that held me and throw me still further into the unknown in front of me constantly called me (and still am...).

467 (***) (April 10) to net retyping these lines, I am struck by a strange irony, the meaning (as that of the Burial in general) is not fully understood at this time yet. The one who has invested all in whole task of "service" for the benefit of a certain "mathematical community," which is ousted from his work Similarly, and with the tacit approval and unreserved said "community", by the very people who made the **denial of service** an imperative of caste and second nature.

The apparent paradox, however, seems to solve a large extent, remembering that the "community" to which addressed the "Service drive" in me was not the sociological entity (with its "caste" notable etc.) that was involved wholeheartedly in my burial; but it was this "mathematical community without borders in space nor in time "which was discussed above. (For comments about the distinction and confusion between these two "communities", see the first note b. p. the subsequent note "Respect" (n ° 179).

468 (*) On the effect of "Chainsaw" cutting short (including almost everyone, from those who were my students) to a momentum alive and strong of a work that was beginning, see the two notes "The heirs...", "... and Chainsaw" (n ° s 91, 92).

469 (**) This sub-rating comes from a note b. p. the main note "maneuvers" (see note b. p. (*) page 848)

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and more canonical style) of the EGA series ("Geometry of Algebraic Elements") 470 (***). these seminars took place at the "Wood Mary" locality (in Bures sur Yvette) which operates the IHES since 1962. Indeed, The first two seminars (between 1950 and 1962) continued at a local fortune in Paris (with the Thiers Institute), before an audience that could hardly exceed ten people, and before whom I was strictly "alone". The acronym AMS date of the years when he was not yet issue of "Wood Mary." I added later this beautiful name to the original name "Geometry Seminar Algebraic ", to make it less austere.

It goes without saying that the result of these seminars, SGA SGA 1 to 7, is numbered chronologically. It was obvious that the overall design of each of these seminars came from me. She was inspired About my overall and long term, ask broad foundations of algebraic geometry, and Increasingly, those at the same time a "geometry" more extensive, I strongly felt from all or less 1963 and following years, and was left unnamed. (I now call named "geometry arithmetic ", synthesis of algebraic geometry, topology

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and arithmetic 471 (*).) The last

p. 866

these seminars is SGA 7, which continued (unlike previous) two consecutive years, 1967-1969, which was hosted in collaboration with Deligne.

The volume in the name sham "SGA4 1

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"Is (as explained above, pages 847 and 851) formed of texts after 1973 so later as the last of the SGA seminars, if we except those looted in SGA 5, and the famous "State 0" of a "thesis" Verdier (which will be discussed with operation III).

All matters of dates aside, the heterogeneous nature of the text component that volume is in no in keeping with the spirit in which I had continued the LMS series, each volume had a **job**

of major foundations on part of my program had yet been developed anywhere

elsewhere - thus excluding volumes of "**digests**" or **compilation** of results already known and well developed, or even new results but sporadic in nature. Strictly speaking, giving the volume

Deligne name SGA 8 (assuming that I give my consent) would have been improper, suggesting a such name the idea (no basis) of a **continuation** of the work I had continued in the seminars

previous USG 1 GAS 7. As for the abbreviation "SGA4 1

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"Chosen by Deligne, it is not only" inappropriate "

but it is itself a **fraud and a sham** . This is one thing that strikes me as

to be **obvious** to each of the many mathematicians who, since 1977, have had opportunity to

knowledge of this volume, and also know the meaning of the acronym AMS, inseparable from my person and my work, and there too, a certain **spirit** . This prevents this sham in the name

even a standard reference text, was tolerated by the "mathematical community" for eight years, without apparently "do not ride". I see with the Pervert Symposium 1981, which is an extension

natural, **the great disgrace** of the mathematical world of the 70, 80, disgrace that seems unprecedented in the history of our science.

There was a precursor episode of this **operation-crowding** , to give the impression that my person would play an occasional role, draft and accessories in the development of basic texts

SGA. This is the "SGA 7 small operation." It about this in "Episode 3" (a

climbing) in note

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"Maneuvers" (n ° 169) and above (of which interests me perspective here) in note

p. 867

"Prelude a slaughter" (n ° 56). It is published in a separate volume SGA 7 II, part of the

original seminar, under the names of Deligne and Katz and excluding myself (and retracting the role that was mine in the development of its main themes and some key-results). I am writing to

470 (***) Written with the collaboration of J. Dieudonné.

471 (*) See note on it b. p. (*) to the P. 844.

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18.5. THE FOUR OPERATIONS (a corpse)

this, in the note cited (n ° 56):

"This" APG 7 "is not a **continuation** of the work continued in the SGA,

but I feel it as a kind of "saw-shot" (or chain saw...) brutal **ending**

the series of SGA, a volume that stands out ostentativeness of me, while

is related to my work and bears the mark as much as the others. "

These volumes SGA and SGA 7 7 I II not yet boast of condescension tunes and thinly veiled contempt with regard to the work which they come, If not then the escalation was able to accomplish yet four years

later, it is because the previous steps (including the mini-operation SGA 7 apparently harmless) have

"Past", never (to my knowledge at least) raise in the mathematical world the slightest reaction.

I want to close with an uplifting epilogue (probably temporary) to the transaction-crowding of me

LMS, foreclosure implemented by Deligne with the tacit approval of "the whole Congregation". he

This is the answer very "cool" that was made recently by Ms. Byrnes, in charge of "Lecture Notes"

in the Springer Verlag, to whom I had written to request elucidation on a volume named SGA

5 and published under my name in 1977 in the "Lecture Notes" without the Springer house saw fit to me

ask my permission or even informing me of this publication made by him. I learn from her

letter (received one month after) it was all the more pointless to bother with such a formality, **that it is**

wrong I pretend to be listed as author of the volume SGA 5, edited by L. Illusie, as I face

on the cover **and as director** of this seminar! (And you wonder suddenly, in retrospect it

that the deceased director was doing there in the seminar. . .) I wrote just to see, to MKF Springer

person, on various strange experiences I had with Springer since 1972 (the year

SGA 7 I had been published under my name in the same way - it is true that I am not more "author" I

ⓐ the SGA 5.. .). I am still waiting a response. . . 472 (*).

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(March 16) This sub-notes was named that was needed, "Eviction (2)." The sign (2) recalls that there p. 868

has had another note of the name "The eviction" (n ° 63), which I have had occasion to refer recently (with

the "Patterns" operation). The "crowding out" which was mentioned (very quietly...) In this note, there is one that has

took place in 1970, during the episode of my departure from the IHES, which obviously suited perfectly departure

my brilliant young friend, recently installed in the place 473 (*). The affiliation between these two "evictions"

one of IHES and the other of the SGA series, seems obvious. I found a striking increase,

in nature yet an "escalation": the first time, it is simply the eviction of me

an **institution** to which I felt very strongly attached to me of course (I could see myself there end my days,

real one!), but I detached myself quickly and without regret residue. The second time, it is

the eviction of my person of SGA, which themselves represent (symbolically surely, and more

symbolically) my work of mathematician - work to which I remain committed today. he

While my "eviction" of IHES is consumed thing for fifteen years - as I doubt, despite

while, so be the same for my ouster of a work to which I had devoted fifteen good years

and wiry in my life.

I thought the fact that I once facilitated the task to oust me SGA, following my movement

spontaneous submit those among my students and collaborators who have invested full-time, some

moments in the development of one of his seminars, as "leader" of the seminar as well as

me. It was not the custom of my time, and is certainly much less today. I do not know if

472 (*) (April 9) For the rest of the story, see note "The Funeral - - im Dienst der Wissenschaft" (n ° 175).

473 (*) It is about the episode I left IHES (1970) in "The Unfinished harvest" section (n ° 28) and notes

"The peel healthy", "The eviction", "Brothers and husband" (n ° s 42, 63, 134), and finally in the subscore (n ° 134 1) to the

last

note quoted.

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I did well. On the one hand it did not correspond entirely to reality, in the sense that there was no

symmetry in the role that I played, and that of my staff, even brilliant and investing

thoroughly like me. This presentation will therefore things in the sense of "ambiguity" (or

"Complacency" young brilliant mathematicians) I examine the notes "The Ascension" and especially

"Ambiguity" (n ° s 63 ⓐ63 "). If this ambiguity introduced by me encouraged some of those who have

SGA collaborated intensely with at one time or another, to "squeeze me" (more or less partial or

more or less complete), I would be wrong to blame them! I harvest

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just what I myself have sown.

p. 869

But this does not prevent me, also, to make a public statement about what happened.

On the other hand, it is also true that this relationship I instaurais with some employees could be

perceived by them as a mark of esteem and confidence (it was indeed), and encourage the same time to invest fully in the task, as I was investing. But now I tell myself that Such estimates and such confidence can be expressed in a manner equally clear and encouraging, without being however tainted by ambiguity. It was a bit as if I "bought" an investment in measure task, the granting of "advantage", "benefit" besides that (in hindsight) seems doubtful. For it is a false advantage to appear what we are not. And it is obvious that in creating an appearance (if not entirely false, at least) a little wrong on the edges, it was my responsibility before that of any Another of me doing figure eldest, who was engaged.

Decidedly reflection joins more than the note "ambiguity" in the unexpected day of "Kind of situation" which I had not thought of writing it. I realize that just as my relationship to the "young genius" (not unknown) Deligne was false, that by false modesty I refrained to assume the role of elder and "master" who was indeed mine with him, my relationship with other bright young people, investing themselves fully in a task that seemed so "common" ⁴⁷⁴ (*), has was also false.

Reflecting continued in the burial showed also clearly enough that if task "commune" there was, it was for the space of a year or two, time for the young man to (say) thesis (which is not bad). The same year I left in 1970 sounded the abandon of a signal immediate and almost total this large set of "tasks" noticeably hot, and indeed I "burned in their hands" the day before ⁴⁷⁵ (**). Apart from the work on the Deligne conjecture of Weil, it

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was also the beginning of a long stagnation in each of the major themes that had me p. 870

more fascinated - a stagnation (except for the "recovery" part triggered by the philosophy of Mebkhout-the-not-named) continues even today ⁴⁷⁶ (*).

b 7 . Good Samaritans

⁴⁷⁴ (*) I@ starting to realize that this was an illusion, at the end of the note "Green light" (n ° 68), p. 260.

⁴⁷⁵ (**) This immediate abandonment of a program and burning tasks, the very day of my departure is mentioned in Note "Instinct and fashion - or the law of the strongest" (n ° 48), especially in the double note "The heirs ...", "... and Chainsaw" (n ° s 91, 92), where I try to review (from the echoes that returned me) that have become themes that were supported by my various students "before 1970".

⁴⁷⁶ (*) (March 17) This sense of "stagnation" may take a more concrete meaning in a subsequent note, I account make a short list of the most commented on "hot" topics that were on my agenda, and who were left behind account, from my start and with a perfect set by those who were my students.

(April 9) See the note about "The tour of building sites - or tools and vision", n ° 178. 692

18.5. THE FOUR OPERATIONS (a corpse)

Rating 169 ²

(13 March) ⁴⁷⁷ (**) In this introduction to SGA Illusie warmly thanks Deligne among others for having

"persuaded to write... a demonstration of the formula Lefschetz-Verdier, **thus removing a obstacles to the publication of the seminar** "

(my emphasis), in clear the hurdle of **lack of "conviction" of Illusie** to write what he had hired to write for **eleven years** - which lack terminated suddenly, as was said above, the the precise moment when the good Samaritan Deligne gives "green light" to the Good Samaritan Illusie that "there could go" . . .

This is the "true in the wrong." As for the **false** system tries to suggest clearly that passage without the say in clear (following a proven style that made school...) is that the seminar SGA 5 **depend on** the formula in question (which was established at the time of the seminar only with assumptions resolution singularities, since lifted, in the most common cases, by the finiteness results presented Deligne in the "previous" volume having name "APG 4 ¹

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" ⁴⁷⁸ (***)). In fact, as the two friends know just as well as I, the role of the Lefschetz-Verdier formula in SGA 5 (as in my demonstration of formula Cohomological

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l-adic L-functions) was purely **heuristic** , providing p. 871

motivation to seek and prove fixed point formulas "explicit" (ie where the "local terms" could be calculated explicitly). So Illusie chimed in with his friend to create the impression that SGA 5 would indeed (and in a way that is not explained clearly by him nor by his friend)

subordinate to the text, so, can not call that "SGA 4 ¹

For details, see Note "massacre" and its sub-notes n ° 87 2 . In this note and all its subscores, I finally discovered (better late than never) that all this introduction written by Illusie and in general, the overall presentation of the edition-Illusie (or editing-killing) is a model of bad faith, served casually and with such candor tunes that make the charm of person.

This touching impression that strives to create Illusie, that it is **thanks** to the good Samaritan Deligne (and the second good Samaritan Illusie, needless to say) that the unfortunate seminar SGA 5 was finally released (Eleven years later, and in the condition that I know), apparently has "passed" without any problems. I found this version in the Serre report on the work of Deligne, made in 1977 precisely, the intention of the Committee International for the award of the Fields Medal. I have no doubt of the utmost good faith Serre, who had also followed that from a distance the maze of oral seminar - besides water had spent under the bridge since. . . He probably took for granted (like everyone else, and without asking questions) what was said or suggested in the introduction of Illusie, he has had to travel one day to see (And he will not see anything!). . .

Interestingly, the same report Serre is also the only place in literature, to my knowledge, where it is said (in this case, the first sentence of the report) that Deligne was my student. no publication Deligne could imply by cons to any reader that the author could have learned something in my mouth.

b 8 . The Trojan

477 (**) This sub-rating comes from a note b. p. in note "maneuvers" (n ° 169) (see note (**)) on page 849). For a more detailed dismantling of the art "go!" to take bladders for lanterns (a "user"

hurry and just waiting to believe), see subscores "Trojan Horse" and "Formula", n ° s 169 3 and 169 5 -169 8 .

478 (***) On this subject the note b. p. (***) and page 841 (*) page 850.

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Rating 169 3

(10 March) 479 (*) In the sub-notes (n ° 67 1) in the note "The clean slate," I point out two examples where Deligne has ignored his usual caution, and is indeed "Advanced ie plain" wrong. For the curious reader and sufficiently well informed, and that would have to hand the note and sub-rating, I point that, apart from the "kindness" towards SGA SGA 4 and 5,

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and "forgetting" some egregious my humble

p. 872

person around (already reported here and there in the note "maneuvers" and in his notes of b. p.)

Patent scams that I have identified are concentrated in paragraphs 3 and 4 on page 2 (in

"Breadcrumb navigation 4 for SGA, SGA 4 1

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SGA 5 "- admire the beautiful procession that here) These seventeen lines....

are also a model of the art of "fish in troubled waters", and largely deserve analysis by

menu 480 (*).

Suffice it to note here that in the first paragraphs of the cities, we read that to establish "in cohomology spreads a duality formalism similar to that of coherent duality ", Grothendieck used the resolution singularities and conjecture purity " 481 (**). This is also immediately adds that in the present volume (thank heaven and the brilliant author), these " **key points** are established by a different method" (my emphasis added), applies it, "for type schemes ended up on a regular pattern of size 0 or 1" that is to say, therefore, in almost all cases encountered by the user.

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Thus, Deligne strives to create the impression, and he even says clearly that all dualistic formalism

p. 873

ity spread that I had developed was still conjectural (at least in non-zero characteristic), and that "these points-

key "were finally established by it, Deligne, and in this volume, that is to say, by its results

finiteness (those already mentioned in previous notes b. p., results which it refers elsewhere

immediately). It would be nice indeed, like yours!, Such as to create the fiction of the famous " **addiction**

logic "of SGA 5 from the text named" SGA 4 1

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"(Dependence asked by this same name, and the

beautiful procession "SGA 4 - SGA 4 1

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- SGA 5 "), and thereby to justify the incredible assertion (cited and commentary) of its preamble:

"Its existence [of" SGA4 1

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] Will soon publish SGA 5 as".

Here is the **Deligne release** , slid the tape here and there in the text suddenly saw-called "SGA 4 1

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"And

479 (*) This sub-note to note "maneuvers" comes from a note b. p. to it, see note b. p. (***) page 860.

480 (*) See, for guided details about the second of the two paragraphs cited, the sub-note "The double meaning - or the art of scam "(n ° 169 7).

481 (**) The text moves on "conjecture purity" by "established in a framework [??] in SGA 4 XVI and - Module resolution - the same feature in LMS 4 XIX in a framework "(incomprehensible to any reader who is" The. " already in the stroke ahead) is a way to hide that this theorem was acquired for smooth algebraic varieties in all feature.

(March 17) I note only the moment the charm of the end of the paragraph quoted, which had "gone to as" raw readings:

" **Various developments** are given in SGA SGA 5 5 I. III, we show how this formalism [??]

involves very general Lefschetz trace formula Verdier. "(my emphasis.)

We admire the "various developments" without further clarification, whereupon the author (who on other occasions known to be precise)

continues with "formalism" (= various developments?), which "involves very general trace formula"; to do

out immediately, the very next sentence (in the following paragraph), that the formula, "in the original version of SGA 5", was "Conjecturally established that."

I just checked in SGA 5 What are these "other developments" in the statement I SGA 5, the title says:

"Complex dualisants" so as bidualité theorem. Why "various developments" instead of "complex theory

dualisants "or" bidualité theorem "? Yet it was not longer, and it was still less muddy! This me

recalls that in the famous statement "Finitude" ie the "Trojan horse", the brilliant author demonstrates precisely a "theorem

of bidualité "without any reference to my modest person - which theorem is also called as dry (in the Introduction

to the presentation I in question APG 5 written by Illusie) "Deligne theorem". Decidedly everything fits. . .

NB. For comments about this bidualité theorem (treated with such false nonchalance...), The long view

Note b. p. (*) On page 852.

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unambiguous in passing the "Breadcrumb navigation" that I just quoted The reality is that I had in the month of March 1963 established as part spreads the **complete formalism of six operations** (going so far beyond the "Poincaré duality" usual) without further restrictive assumption that (obviously essential) work with torsion coefficients "first" to residual characteristics

schemes contemplated 482 (*). This is only for **bidualité theorem** in étale my

demonstration made use of assumptions mentioned by Deligne. This theorem, which was of a type

unknown cohomology ("spaces" of any kind) before I discovered, has also played in

Seminar SGA 5 only an episodic role in demonstrating the

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Lefschetz-Verdier of formula 483 (*), p. 874

wherein formula played itself a purely heuristic role 484 (**). In the apocryphal text

Deligne, as said bidualité theorem is also **zero** (except that of be demonstrated under

helpful assumptions, and - under the obsequious feather Illusie and with the encouragement of his friend - become suddenly "Deligne theorem". . .).

It is not a question of minimizing the interest the results of finitude Deligne, which actually fill

although a gap (among many others) in SGA 5, as it is in the nature of things. no theory

intensely alive math is completed! But it is clear that Deligne exploited this

contribution, as useful as it is modest (it was deeper and more difficult, and without evil

still ...) in the **swelling** beyond measure, to make it the "Trojan horse" of a monumental operation

scam: the "Cohomology spreads" operation.

This same "Trojan horse" reappears elsewhere in the "review" already cited volume called "SGA4 1

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presented by Deligne for Zentralblatt (see note b. p. (**) 851 page). In the last paragraph of one, I read:

"It proves that for type schemes ended up on a regular pattern S of dimension one, **the opera-cohomological usual rations** [if not the "six operations", it must above all

to name!] transform any building beam building beam. "(It is I who

highlighted.)

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The thing is formulated to suggest that before the brilliant volume presented by the author, was available p. 875 finiteness theorem for any of the famous "routine operations" in étale 485 (*). I have had the pleasure yet to prove the first theorem as finitude, and most important of all, for the functor 482 (*) Thus, the "six functors" and essential for the formulas, the most crucial is the "dual formula" for a separate morphism of finite type (which can be considered the most general version imaginable to date, the classic Poincaré duality theorem), were established by me, without that at no time in imposing finiteness assumptions to coefficients. Besides, Deligne knows better than anyone, since it is **none other than himself** who made a detailed drafting (My notes 1963) of the statement of APG 4 where it is developed duality formalism (centered around the formula duality in question)!

483 (*) (March 17) This does not prevent that in the second quoted paragraph Deligne connects instantly to emphasize that this formula "Was established only by conjecture," and that "more local terms were not calculated" ("affirmation" that has no mathematical sense, but that helps create about SGA 5 feel "gangue nonsense" for charitable oversight. . .).

I admit that at the first reading of these passages, there will be one year, I was stunned - the meaning of these comments strangely "next to the plate" on a text that was also recommended to forget completely escaped me. With hindsight, and for a "work room" attentive, finally appears an **intention of ownership**, served by a **method** of retraction ("to confuse") carefully and fully developed, behind which prima facie gave me printing a single epidermal malice, speaking on happiness lachance over a complacent pen. For a more detailed review of the methodology, see subscores "Formula" (n ° s 169 s - 169 9) in note "maneuvers".

484 (**) As I noted below (in sub-note "The real math..." (N ° 169 5), this formula was psychologically important, providing a **motivation** for the development of formulas of fixed points "explicit".

485 (*) This goes in the direction of "confused state of SGA 5" which (as was said above in the same review) this Volume was "cured".

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R^1 (cohomology with proper support), and this also in the same day (if I remember correctly) that following my discovery of the **definition** of such a functor in étale (coinciding! with the "commonplace" $R^1 f_*$ when f is supposed to be clean). It was in February 1963 before he had the honor of meeting my future student, and at a time when nobody except me yet (Artin and, in a pinch) was too sure if the étale it "existed" indeed. She began to **be** really in those days.

There remained the question similar to f^* , which proved more resistant, and is also still reread with all the generality that (arguably) deserves. Besides, I had done from that year (if not the same month) the "unscrewing" necessary (the first came today shipped a jiffy ...) showing that from finitude to f^* , it could be proved that $Lf^!$ and $R\text{hom}(\cdot, \cdot)$ $R\text{hom}(\cdot, \cdot)$ 486 (**).

It is true that it has since become the "base folklore" of the étale, and is surely one of "Technical digressions" my brilliant precursor "SGA4 1

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"Is intended to" forget "...

b 9. **"The" conjecture**

Rating 169 4

(March 12) 487 (***) More than once since the publication of the article Deligne "Guess Weil I" (where he established the "final stage" of conjectures, which I had left open), I noted as a strange thing, but without stopping before them all day, that speaks of Deligne's conjecture Weil, where use was previously said **the** Weil conjectures. It is in this form, a series more stunning each other assertions that are presented in the conjecture in question Article Weil (Number of solutions of equations in finite fields, Bull

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Bull. Math. Soc. 55 (1949), p. four hundred ninety seven-
p. 876

508), and thus also that I have learned from the mouth of Serre, the mid-fifties. It is Yes there are in this set of conjectures, eclectic at first glance, an obvious **unity** of inspiration, from first intuitions related cohomological formalism (via the formula Lefschetz), and Also (I presume at least) of Hodge theory.

By creating and developing such a **cohomology tool** for varieties on any base body, I was able to demonstrate a good part of these conjectures. I did it, assisted by Artin, Verdier and others, devoting three years of tightly packed my life working on pieces meticulous, materializing into two thousand "unreadable" pages "gangue nonsense" and "technical digressions," which allowed a Deligne to "cut" the last step in twenty dense pages. . . In addition, drawing inspiration from a remarkable "similar kahlé-nothing" to the Weil conjectures, discovered by Greenhouse, I could clear (what I have called the " **conjectures standard** "on algebraic cycles) while the principle at least a **transposition Hodge theory** on an arbitrary base (or more specifically, a transposition which, in Hodge theory, is really relevant, a point of view "algebraic" for the algebraic theory of cycles varié-

complex algebraic varieties). Left to rephrase slightly (and obvious) in their conjectures original shape (may be too optimistic), they are valid at least in characteristic zero, and are "Probably true" also in characteristic $p > 0$ (as long as the conjecture of Weil are...).

It is surely no coincidence if the same Deligne holding to be "singular" conjectures Weil has also sought to retract the role played in their demonstration by one who was his master, and it is he who has sought (successfully, given the general apathy) to discredit the "conjectures 486 (**). Of the two remaining operations among the six, namely L_f^* and L_f^* .

The \otimes , it is trivial they transform coefficients constructive patible into building coefficients.

487 (***) This sub-rating comes from a note b. p. in note "maneuvers" (n ° 169); see note b. p. (***) page 857.

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standard "as a dead end, out of reach what is more, and as a **barrier**, to be honest, now exceeded thanks to God (and his humble self), on the way to the demonstration of the conjecture Weil 488 (*).

b 10. **The formula**
(A) The real math. . .

Rating 169 5
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(17 March) famous "Weil conjectures", for an algebraic variety X defined on $p. 877$ finite k , concerning "function L " (so-called "Artin-Weil") associated with X . It is defined as a some formal series with rational coefficients, knowledge of which is equivalent to the number of points X rational over the field k and all its finite extensions. The first assertion of these conjectures is that this formal series (constant 1 term) is developing a series **based** rational over Q . All other statements concerning the particular form and the properties of this rational function, in the particular case where X is connected projective and nonsingular. At the heart of these conjectures is a certain formula, canonical presumed having this rational function as

$$L(t) = \frac{P_0(t) P_2(t) \dots P_{2n}(t)}{P_1(t) \dots P_{2n-1}(t)}$$

where P_i ($0 \leq i \leq 2n$, with $n = \dim X$) are polynomials with integer coefficients constant term 1. The degree b_i , P_i is supposed to play the role of a "i.ème Betti number" X (or more precisely, for variety corresponding X over the algebraic closure k of the field k). Thus, when X comes with "reduction since. $P > 0$ " of a nonsingular projective variety X_K defined over a field K of characteristic zero, then b_i is be equal to i.ème Betti number (defined by transcendental path) of the algebraic variety **complex** obtained from X_K by any of $\text{dip } K \text{ in } \mathbb{C}$ 489 (*). The rational function must satisfy **functional equation**, which is equivalent to saying that the roots of P_{2n-1} are exactly the

$$q^{-n} \xi_{\alpha} \text{ where } q = p^f \text{ is}$$

the cardinal of the base body k , and where ξ_{α} traverses the roots of P_i . (Morally, it had "come" to the existence of a "Poincaré duality" for the "cohomology" unnamed and undefined, variety X .)

I believe that Weil was also conjectured that for $i \leq n$, the zeros of P_{2n-i} were exactly the $q^{-i} \xi_{\alpha}$ where ξ_{α} still runs of zeros P_i (or, what amounts to the same in view of the duality condition **that**

the zeros P_i are grouped in pairs, equal to the product q_i for each). The "reason" here is a heuristic Another important property of the cohomology of projective varieties

0 non singular complex, expressed $p. 878$ this time by the "theorem Lefschetz" (version called "cow"). The last of the Weil conjectures, analogue "geometric" of the Riemann conjecture is that the absolute values of the reciprocals of the zeros of P_i are all equal to q_i

2 (which leads to assertion estimated with high precision on numbers of 488 (*) (16 March) For some details on this double-retraction débinage, see Eulogy Funeral (notes n ° s 104,105), and something about this praise at the beginning of Note ° 171 (x). For a more detailed examination of the art of the retraction, see all subscores "Formula" (n ° s 169 5 - 169 9). (X) (May 11) The beginning of the old notes "The Apotheosis" separated from it, to become a separate note "Jewels"

(n ° 170 (iii)).

489 (*) As Weil was his conjectures, it was not even known that b i defined and were independent of plongement chose K in C. A few years later, it would result from the greenhouse theory of sheaf cohomology consistent, which gave meaning "purely algebraic" the finer invariants $h_{i,j}$ of Hodge theory.
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points X_{490} (*).

The rationality of the function L generally X variety Dwork was established by in 1950 by methods "p-adic" no cohomological. This method therefore had the disadvantage of not providing interpretation cohomological function L , and therefore does not lend itself to an approach other conjectures, X nonsingular projective. In the latter case, the existence of a cohomology formalism (on a "Body coefficients" R characteristic zero), including the Poincaré duality for projective varieties nonsingular and a formalism cohomology classes associated with cycles (intersection transformant tions in cup-products), so essentially allows "formal" to transcribe the classic "formula Lefschetz fixed points. "Applying this formula to the Frobenius endomorphism of X and its iterates, we would obtain an expression (1) as required by Weil, or P_i are polynomials with coefficients in A . It should be clear to Weil from the moment he had set out these conjectures (1949), and it was in Anyway Serre as for me in the fifties - hence the initial motivation for precisely develop such formalism. This was done in the month of March 1963 with $R = \mathbb{Q}_l, l \neq p$. It was just two grains of salt:

- a) It was not clear a priori (although it was convinced that it must be true) that the polynomials $P_i(t)$, which priori were with coefficients in the ring Z the whole l -adic, were in fact **ordinary integers**, and Moreover, independent of the first number envisaged l ($l \neq p = \text{car. } k$).
- b) The rationality of the function for a non-singular projective X , you could not deduce that for X general, if we had the resolution of singularities.

The problems raised by a) have played a crucial role, of course, for the birth and development of the yoga **units**, and subsequent formulation of **standard conjectures** closely related to yoga. They also stimulated thinking to find a

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theory **cohomological p-adic** (conducted by
p. 879

Following the "theory **crystal**"), as a possible approach to prove all the coefficients P_i , once you can (p. Eg. Through an affirmative solution to the standard conjecture) that they are rational and independent of (**including** for $= p$).

Anyway, so we were in 1963 expression $(L) L$ (but which depended a priori the choice of) the functional equation, and the good behavior of Betti numbers by specialization. he therefore remained to resolve the issue), to prove the assertion for the absolute values of P roots i and finally (for good measure) the relationship "on Lefschetz" on P zeros i . This is what was done ten years later Deligne in the article "The conjecture of Weil I", Pub. Math, the IHES n ° 43 (1973) p. 273-308.

As ingredients of this proof of Deligne, it was therefore in no need of a formula more sophisticated fixed points that the phrase "ordinary", which was available (with nothing "speculative") since the beginning of 1963. The only other ingredient in cohomological Article Deligne, if I am not mistaken, is the cohomological theory of Lefschetz pencils (v spreads) that I had developed around the year 1967 or 68, supplemented by the formula Picard-Lefschetz (proven in spreads by Deligne), one and the other set in the volume SGA 7 II which was discussed (and which my name, coincidentally, has but disappeared. . .).

The formula "more sophisticated" fixed points, called "**of Leschetz-Verdier**" against has played a **role psychological** important to encourage me to clear the cohomological interpretation (L) of L -functions, valid for any variety X (not necessarily non-singular projective). This formula Verdier me reminded that there must formulas fixed points unconditional non-singularity on X (as was well known already in the case of ordinary Lefschetz formula), but mostly, it attracted my attention
490 (*) In this last of the Weil conjectures, resulting simultaneously writing $(L) L$ is a function **single**.

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on the fact that there are forms of fixed points on the cohomology with **coefficients in a bundle** ("building") **one**, performing an alternating sum of traces (in cohomology spaces with coefficients in such a beam) as a sum of "local terms" corresponding to the fixed points of an endomorphism $f: X \rightarrow X$ (when they are isolated). In this heuristic motivation, the fact that this formula Lefschetz-Verdier "remained conjectural" coach. $p > 0$ (because it lacks resolution

singularities

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and hence the "bidualité theorem"), **was entirely irrelevant** 491 (*).

p. 880

As so often, the key step here was to find " **the " right formulation** (in this case for a "Cohomological formula of L-functions"). The formula Verdier suggested to me to involve a fais-CWater l-adic (Building) arbitrary, instead of the usual coefficients beam (which until then remained implicit), namely the constant sheaf Q_s . It was therefore, by modeling Weil definition of The function "ordinary", define a "with coefficients in F ". Once we dream to do so, the definition is self-same: it is the one given in my presentation Bourbaki December 1964 (Formula Lef-Schetz and rational functions L, Sem. Bourbaki 279), it is unnecessary to repeat here. Moreover, "terms local "plausible formula Lefschetz-Verdier (in terms of the coefficients given beam, and correspondence Frobenius) are also needed. Finally (we@ cocky or you do not!), Why not not write the formula here, abandoning even the assumption of cleanliness of the formula Lefschetz-Verdier "orthodox", but working with the cohomology to **own support** ?

Thus, not essential, again, was to identify the "good statement" (ie, **the "good formula "**) **sufficiently general** and thereby, sufficiently **flexible** to be suitable for demonstration, in "on" without problems through recurrences and "unscrewing". I would not have known (and none to date be) demonstrate **directly** "" Formula functions L "ordinary" for any X (or even smooth, but not clean, or vice versa), in terms of l-adic cohomology (to clean surfaces) with coefficients in the beam l-adic **constant** Q_1 , bypassing the sheaf generalization. (No more than I could known in car.p> 0 prove the formula Riemann-Roch-Hirzebruch **ordinary**, if I had not first widespread as a sheaf formula for **applying** clean smooth algebraic varieties - and person, to my knowledge, can not do so today. . .)

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In the statement Bourbaki in question, I confine myself to the general statement of the formula functions L p. 881 "Coefficients" in the beam-adic ordinary, and I show how, by simple unscrewing, we reduce to the case where X is a smooth projective projective curve. I knew that once arrived there, **it was won** - because we "hold hands" of sufficient size one, for the demonstration of the formula in question becomes a matter of routine 492 (*). I@ not busy myself at this time to release a right formula of fixed points in one dimension and prove it seemed that it would be rather Verdier to play. He gave a formula of fixed points, so-called "Woodshole", the following year, which was enough to style Frobenius and application functions L. I took con birth of his statement, which does not really me satisfied, because it seemed that the conditions it imposed on its cohomological correspondence (for demonstration purposes I have not read) were somewhat artificial - I would have liked 491 (*) (March 20) It was to the point that last year, I had completely and long forgotten this fact, and fell naked reading (under the pen Deligne) that the formula of Lefschetz-Verdier "was established only in version conjecturally Original SGA 5 ". I return to this point in the discussion the next day and the day after (18 and 19 March). (In subnotes n ° 169 6 and 169 7 .)

492 (*) If I speak of "routine work", it is not in a pejorative sense. Nine-tenths, if not even much

Moreover, the mathematical work is of this type, both at home than any other mathematician who happens to pass by moments which, precisely, are **something else**, creators times. After Verdier, I myself have spent time turn crank techniques available, delicate and well-oiled, to find and prove a formula of fixed points in dimension one that satisfies me (at least temporarily). This was the work "routine" as had been that of Verdier.

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a formula that applies to every endomorphism of an algebraic curve. The seminar was the SGA 5 first good opportunity to develop such a formula which is to my liking. (It is, I believe, that contained indeed in the statement XII Edition-Illusie, who miraculously survived the vicissitudes that struck the unfortunate seminar.) Weil conjectures were an initial motivation, and a wire valuable driver for me "run" on the development of a complete formalism étale (and others). But I felt that the cohomological theme, which was the focus of my efforts for eight or nine years and was to remain so for years to come until I left in 1970, had is broader even than the Weil conjectures that had brought me there. For me, the endomorphism Frobenius was not an "alpha and omega" for cohomological formalism, but an endomorphism among many others. . .

It seems to me that the Deligne initial motivation for his "operation

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APG 4 1

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- SGA 5 "was the in-

p. 882

tention of ownership of the only trace formula, and by and by "corollary" to that of L-functions, It along the way that this connection was expanded in about an appropriation of "étale" all short. I also believe that both "piece" was too big, and that even today, notwithstanding "APG 4 1

2 "Perverse and Symposium, and many others," people "(even those who are not so well informed)

"Know" that it is not he who created the tool cohomological l-adic, and has not proven his own, "the" conjecture of Weil. This prevents to finish with the operation "cohomological spread", I would still follow somewhat by the twirling of my friend and former student Deligne in his presentation of the central theme 493 (*) volume named "SGA 4 1

2 "Ie," the "trace formula, leading to the cohomological formula of L-functions It is the subject of the "Report on the trace formula" (quoted [Report] in his book, loc. cit. p. 76-109).

It is **four** places of the volume Deligne made kind comments so slightly "historical" the trace formula. The reader said volume that would not already in the know in advance, and it reads or not the four passages (we will review), will derive the impression that a Grothendieck (author or director of a seminary a bit muddy and later the volume "SGA4 1

2 "Seminar that recommends especially not venturing to read) seem to have had some idea, a little confused inevitably, on the functions L, before the author of the brilliant volume finally comes to give statements understandable and demonstrations that standing. Throughout the volume the only specific reference this is a typical person exposed Bourbaki (1964), the turning of a "Note 3.7." (Loc. Cit. P. 88), which comes out as end last in a row of three points each more technical than other 494 (**). It reads:

"If we accept the formalism of Q the -faisceaux... **It's easy to bring proof** of 3.1, 3.2 in where X_0 is a smooth curve and where ζ_0 is smooth. This is clearly explained in [2] §5 (for 3.1; 3.2 is treated the same)."

0 (my emphasis). In short, unnamed chap (if not as flattering sign [2] 495 (*)) has (not p. 883

493 (*) It is also said nowhere in "SGA 4 1

2 "as the" Report "much like the" central theme", nor that it is said that the main purpose is to provide the main ingredients of étale for "" Weil conjecture. At time write the double introduction to the volume, about the ownership of all the cohomology dimensions spreads and -adic must already be present.

494 (**) As I write this, I was under the influence of feeling striking **identity** between the style I probe here, and one that is deployed four years later for the appropriation "with contempt" of the "theorem of God" (aka Mebkhout). I discover twirling in question in the note "The Conjurer" (well worth the capital...), n ° 75 ". There the "sensitive point" was hidden in a remark 4.1.9 (instead of 3.7), even more messy. You can not stop progress. . .

(March 22) He had escaped me that there is actually a second reference in "SGA 4 1

2 "exposed to the same Bourbaki 1974

Reference served with consummate skill in the "Breadcrumb", as explained in sub-note "The double meaning - or the art of scam" (n ° 169).

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not **made**, of course, but) **explained the trivial job** - even so trivial that it is hardly worth mentioning in the remark end position, and still having the kindness to suggest that, for trivial trivial, it is at least explained clearly. (We already know, from other comments the brilliant author that clarity is not so much the height of confused chap in question. . .) To put it another way: this chapter "Report on the trace formula" is intended to **do the real work**, leaving trivial perks to those who are here for. . .

Since I am, in other words at once that the same page is one of four crossings which

I was referring, containing historical comments on "the" trace formula. This is the section 3.8

(Next, just as the previous remark 3.7). It explains that one has "two ways"

to prove 3.2 (ie, the trace formula in the only explicit if it is discussed in this

volume, namely the special case of the correspondence of Frobenius). Needless to say the name of the typical person does appears in neither. There are the so-called Method A "Lefschetz-Verdier" and the so-called B "

Nielsen-Wecken "(that name as yet told me anything...) Let's see what he says.:

B.Nielsen-Wecken. A method inspired by Nielsen-Wecken work helps bring 3-2 [the for-

mule tracks to Frobenius] to a particular case proved by Weil; this is what will be explained in the following paragraphs. "

In fact, s. 5 (pp. 100-106) is titled, appropriately, " **The**

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Nielsen-Wecken method . "We were p. 884

previously said that the method was **inspired** by the work of Nielsen-Wecken - so this is surely pure modesty that the author calls the volume "Nielsen-Wecken". This is all the more clear that it is not guys now. If the reader is advised to look at the bibliography in a statement which XII it is never referred (and in a seminar in addition we advise him to forget), he will know that this is the guy who published the early forties. If he even read their fine work (the brilliant author, I bet, has never held hands), they will know that their methods are triangulation techniques. This is apparently not the text. A failure to state the contrary, it is therefore the modest author Volume is also author of the method. No date is given for this, no doubt out of modesty Again, not to say that it is really he who first had typed the job to demonstrate that famous trace formula.

Let anyway method A so-called "Lefschetz-Verdier" what is said. This is not exactly encouraging:

"If X_0 is clean ... the general formula traces Lefschetz-Verdier can express

3.2 the second member as a sum of local terms, one for each point X_p

In the **original version** of SGA 5, this formula was proven that modulo resolution singularities [we suspected that we would meet as seed!]. The reader will find unconditional proof in the **final** [still too modest to remember that

it is thanks to him that the setting was saved - anyway we will be careful not to read the damn SGA 5]. In the case of curves, which if we can reduce (3.7), the ingredients [? ? ? - we abandoned. . .] Were also all available. "

But then, if they were (will wonder perhaps more awake than the other player, if found) why all this blather about a Lefschetz-Verdier formula that was proven that yada

blah? Do we not come to say that the **real** work was done in dimension **one** ? Answer: this is the method

495 (*) Each turn - in 1970 (the International Congress of Nice) is Serre (in communication Deligne "theory

Hodge I ") which, instead of being appointed, was entitled to the symbol [3] in the cryptic line where reference is made to the first and

last time) to "sources" for the theory presented. . .

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called "cuttlefish": eject ink to fish in troubled waters! At the point where the reader is, it is already fully convinced that this is certainly not the good method. This is an extinct eye that travels The following paragraph, which will give him the rest:

"To deduct 3.2 from the formula of Lefschetz-Verdier, we need to calculate local terms

[Pity, what a pain ...!]. For a curve and the Frobenius endomorphism [ah! they deflate!], it was done by Artin and Verdier [and they have gotten in two again!] (see JL Verdier

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the Lefschetz fixed point theorem in cohomology spreads, Proc. of a conf. on Local Fields p. 885

Driebergen, Springer Verlag 1967) and the **final version of AMS 5**) [one wonders a bit What could possibly have to look like the original, poor us!]. "(Here and above, it©me which emphasizes pure malice!)

It is through charity, obviously, the brilliant author dispenses to refer to the relevant briefing seminar doomed to oblivion, or imply that only "the" formula is there indeed! The player indémolis-sand and curious, who would be advised to dig there yet, would have found XII exposed to unusual name "Formulas Lefschetz and **Nielsen Wecken** in algebraic geometry by A. Grothendieck [always the same chap, My word!] written by I. Bucur [not know]. "Surely the chap and his sidekick have copied the presentation their brilliant predecessor, overloading the pleasure to superfluous details. . .

In the famous "report" anything that would make suspect the reader that there (apart from the formula Lefschetz-Verdier or rather we should say, Lefschetz-Verdier-Deligne, anyway uninspiring, as reflected in the comments of the disillusioned author himself) a formula of any explicit evidence and and all, for **another** thing the only Frobenius endomorphism. Both in the quoted passage, referring to Artin-Verdier in another (lower city) referring to SGA 5 (especially for not naming the typical person), it is suggested that the work was done **only** in the case of the Frobenius endomorphism. We boyfriend with Verdier (and proves it), but for the trace formula, it is a done thing reference inch Verdier agree (in a breath with Artin 496 (*), and drowned in the midst of a technical text and few

inspiring, soon forgotten gone) - but it is well understood and there is no mistake: the formula of Traces is **it, Deligne !**

True said Deligne has more than one string to his bow, and that it is not for nothing that he has scattered those comments historic appearance (sic) in

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four different places, just to catch up in one what

p. 886

could blame him for failing (or overdone) in the other. There it will fall back on introducing the same chapter, everything has been planned! It is an introduction of seven lines worth quoting at length ⁴⁹⁷ (*).

(B) . . . and the non-sense. . .

Rating 169 ₆

(18 March) It was necessary that I stop in the middle launched yesterday, because it was prohibitively later, and it was clear that I do not end with "Formula" the same night! Before the motors on some twirling around the formula, I would take the opportunity of all, in the case ⁴⁹⁶ (*) I had met this proven technology Deligne to drown a fish to retract Doe (here Verdier boyfriend and yet which will be given substantial compensation elsewhere), naming it in one breath with another - suddenly we can not blame him for not being generous! This is the retraction method called "of **dilution** by assimilation." Art in the method is to find the man who makes "pair" with the typical person that it is retracted. For me, it is every time Serre that my friend uses. . .

⁴⁹⁷ (*) (20 March) I return to this introduction in the reflection of yesterday. (See "The double meaning - or the art of the scam" sub-score n ° 169 ₇.)

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the beautiful formula "Lefschetz-Verdier" to put a little "feet in the dish." This formula illustrates how perfect something that seems essential to me, to which I returned emphatically more than once in Crops and Seeds and from the Introduction ⁴⁹⁸ (**), but in terms that remained perhaps a little too "general".

This formula is a striking example of a statement that is **deep**, and whose demonstration is "trivial" (169 ₆ bis). When Verdier said he had cleared and proved Lefschetz formula for "corresponding cohomological dances" (which had not even been defined yet there) on algebraic varieties any ("clean", though) and for "coefficients" any constructible, I was initially incredulous. Perhaps the idea had occurred to me a Lefschetz formula with "coefficients" or more less general - I had to write a whole at least, for a long time, for coefficients "locally constant" ie in a local system, but. **I did not believe** for general coefficients - it looked Too good to be true ! Verdier did not have to take a long time to convince me. Write the formula session tenante and my show, had to take a quarter of an hour - and again, it because I slow, especially when This is to make sure of something so unexpected! This is what might be called a "demonstration **trivial** "in terms of what is" well known ", I mean. And following the wind blowing today (and JHC Whitehead which has already received the first puffs ⁴⁹⁹ (***)), there is therefore a step (blithely crossed by many) to classify the theorem itself as

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"trivial" - a formula from ten or p. 887

percent, which "fall" all the cohomological formalism only - here formalism **full** that I had develop within spreads the previous year (1963): les six operations, **and** the bidualité theorem. If I say that the theorem discovered by Verdier (following the lead of Lefschetz) is "deep" is not here not for the reason (yet effective) than formalism derives its demonstration is itself even "deep". Moreover this same wind of fashion long ago (and with the unconditional support of Verdier himself, what more!) Formalism ranked among the "big slices Grothendieck" that scans the back side of a hand, while using said tacitly "slices" at every step (unnamed). The question even if this theorem "remains conjectural" (as Doe points with airs of commiseration) or was fully established in any feature (as it is now, thanks precisely to the "theorem bidualité" bearing the name of that Doe) is for me just as accessory, when I say that it is a deep theorem, which enriches significantly our understanding of "theme cohomological" in all kinds (discrete or continuous coefficients and "varieties" or "spaces" of any kind ...). The same thing also could say of ordinary Lefschetz formula in the case say a differentiable manifold (Or the like) compact, and an endomorphism Icelle insulated fixed points: the demonstration "formal", in from a duality formalism in cohomology, held in a page, except in a few lines. In one both cases, however, there has been **created** - something new and substantial, which had escaped all until then, which "did not exist" (again), suddenly appeared. . .

Where exactly is "the creation" in this case? I think more of a mathematician, and more one of those who were my students, yet they have once known what it is that creation and that have since

long forgotten, would do well to meditate on this case, or any other similar, closer to him. I know well if I had proposed to myself, or any of the students or colleagues of those who were so well "in the know" of cohomological formalism ⁵⁰⁰ (*), to clarify a general formula of Lefschetz, for 498 (**). See Introduction 4, "A journey in pursuit of the obvious things."
499 (***) On this subject the note "The snobbery of youth - or the defenders of purity" (n ° 27).
500 (*) There were no masses then to be "in the know" (now nor elsewhere, given the turn of taken the events. . .) - but there had to be three or four, outside Verdier and me. Deligne, he had not appeared around. . .
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any coefficients and "cohomological correspondence" (to them to define ad hoc!) any
Also, on a compact manifold (pardon own)

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any, everyone would inevitably come in there
p. 888

putting a few hours or days, or weeks as needed ⁵⁰¹ (*). Once the problem is posed (Was it so still unclear, while the main terms yet to be defined ...) and seen, the " **fix** " (in this case, finding **the** right wording suggested by the cohomological formalism existing) becomes a question " **routine** " (what Weil calls, in the same sense I think, a "year"). This "routine work" involves flair, a minimum of intelligence and imagination for sure, but (as I wrote more than once) that are then "things themselves that dictate" how to approach to little we know only listen. (And if we do not know listen mathematical things, we should have to choose another profession. . .) It is not in this work-up is where the **e spark** I want to talk, which brings out the new item ⁵⁰² (**).

The creative moment, the spark that triggers a process of discovery, it was here where the **problem was seen**, and more, " **assumed** " - when the idea is born to **look** really, **to go through** to to get to the bottom, to "see" **what** exactly is **the** "real" domain of validity of this formula Lef-Schetz, which everyone claimed it was "understood". What made the spark, it is not a "Virtuoso" or "power" (in the usual sense of brain power to master the technical difficulties or store nested situations. . .). It is an **innocence**: everyone believes to have understood the Lefschetz formula, but me, poor me, I have yet to feel understood, and I would well get to the bottom of what is! In a case like this, once one has started, **it won**: things blow us what to do, and we do it. Go "to the end", it may mean in one case, prove "the" good theorem (in words, in this case, an existing formalism - that formalism itself is "established" or that he "remains speculative" is irrelevant here). In another case, this can

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mean: clear "the" good guess ⁵⁰³ (*); and that it often is itself temporary, it
p. 889

may prove to be false or insufficient, and it takes the adjust or expand, is incidental.

This conjecture is one of the steps on the way to a deeper collective knowledge of things (in Here, mathematical things), a step which could not do without ⁵⁰⁴ (**).

Depth and fertility are closely related qualities - it strikes me as a tangible sign of this one. The first sign of the fertility of the formula discovered by Verdier came the same year (if this is in the days and weeks that followed, I can not say): This formula was **the** main motivation, leading me to write a cohomological formula of L-functions " **coefficients** " in a beam l-adic one. The fact that **technically**, I have not had to make any use of the formula of Lefschetz-Verdier, is irrelevant here. What is certain is that without this formula as a guideline, or rather that

⁵⁰¹ (*) Of course, I assume here that the person in question has good "hooked" to the problem, so that the "feeling" that I would have had (otherwise I would not have proposed!) has "passed" and that the student or colleague "triggers" indeed. It is not

at all an obvious thing, that "it happens" - far from it!

⁵⁰² (**). Let alone the "spark" she gushes in such extra work, ten years later perhaps, that would establish the assumptions that are "walk" such a demonstration are indeed verified where we expected. . .

⁵⁰³ (*) The two cases, one where the "spark" (followed "to the end") makes us lead a theorem, or against a conjecture, are not different in nature. "After" means: to be fully realized intuition yet diffused by probing all aspects and by all means available. A theorem is not inherently more "completed" a conjecture. There are obviously preliminary theorems (even lame and lopsided), as there is speculation (Like all the Weil conjectures) that give the impression of a whole fully completed, perfect. This prevents these Weil conjectures were a starting point to other developments (conjectural first as them) broader and include. In this sense we can say that no thing in mathematics, as long as it is alive, is "Finished" or "final".

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blew me that "there must be something," such a thing that a function L "coefficients" in a beam - without the insistent voice, I would not have even thought to clear **the** good concept and formula relevant that goes with it; where I would have probably happened in the following years, but having **first** to discovered on my own that other more general formula, which was "on the way", he **was** discovered.

Psychologically, the two situations are very similar. Just as Verdier had to first clear the notion of "cohomological correspondence" to specify the "problem of the Lefschetz formula" (in beyond the formula "ordinary"), and I had to clear the notion of function L "coefficients" to

specify p. 890

the "problem of the formula functions L" (meaning: beyond the case of the function L "ordinary" associated with a clean, smooth X ...). The "creative moment", the one where a spark passed, is where I **seen this problem** : define such generalized functions L - and I **assumed** , going to the end of this problem there. Once the problem is seen, and assuming I get to the "pass" to any of people around me who were "in the know", it was clear that he could not help solve it, " **the** " only natural and reasonable way, with a few days probably (as has been the case for me), definitions, statements, demonstration and all 505 (*).

It's true of course that the "unscrewing" that lead back to a dimension are "easy" and even "trivial" if we take it. It is not in this kind of unscrewing, the first comer will do as well as me (or deign do), that there is **discovery** . The discovery is a **concept** to which nobody had thought so it is **obvious** : the function L "coefficients". In this concept and formula that is inseparable, there is the possibility (in the context of such schemes over the body first \mathbb{P}^1 , or more generally, the absolute basic ring Z) to interpret the "six operations" in cohomology, starting the functor $f_!$ (Thus the operations of "natural **geometric** ") in terms of operations on "fields The functions ", ie in terms of " **arithmetic** ". This was a new step in the direction inaugurated by Weil conjectures in 1949 to espousals between geometry and arithmetic, through the cohomological theme.

What happens to these two discoveries in this text that looks like **the** standard reference book for étale and l-adic - this text due to the most gifted and most prestigious among those who were my students ?

The formula of Lefschetz-Verdier, who had inspired me without I had never "use" has become the **e pouvantail** brandished with timeliness, to hear the reader (which asks only believe!) to which wire tenuous and uninviting (and "speculative", what is more, besides the local terms "were not calculated ") was suspended a seminar

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which ("in the spirit of this volume") we abstain p. 891

charitably never refer (if not solely for the run down ...) recalling anyway discreetly here and there that if said unwelcome formula (and unusable in a word) still has ceased to be "Conjectural", thanks to the modest author of the brilliant volume.

As for the notion of function L with coefficients, which is the central notion of this Report constitutes the heart of the book, she appeared without fanfare in par. 1.6 Report (loc. Cit. P. 80) without the any comment that would indicate a motivation or origin. A definition is a definition after all, one does not have to justify it. The player who pose a question about the origin of this concept, a little preposterous we must admit (especially when you balance like that fasting ...), has the choice between Artin-Weil (but there was still no beams l-adic their time visibly introduced

505 (*) I put here but not the last demonstration, which I had left open (as not to pose a real problem), which might be longer.

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by the author in this volume. . .), And (more likely) the same brilliant author, who is now the nimble lead to a formula called "traces."

It is introduced by. 3 (... Supra p 86), which begins as follows:

" **The interpretation cohomological** Grothendieck functions L is the following theorem: .."

(Follows the formula in question 3.1 - NB this is my emphasis).

Apart from the introduction to the chapter (on which we will return), this is the only time in the entire chapter

where a name is pronounced ⁵⁰⁶ (*). It is the same chap again, which it will be referred both pages further by the [2] acronym (as one who knew "explain clearly" a few "easy cuts") who also Given this "interpretation" preposterous 3.1, balanced out without warning. There was no merit besides, as the reader will notice it immediately (and not surprisingly) as the demonstration held in half a page sentence (on the same page 86) and was also "classic": it is a simple corollary of the famous " **formula traces** "which gives its name to the Report, which is the subject of which, obviously, is the " true theorem. " (3.2). No name is advanced to indicate the paternity of the latter - ie to " **the** " Formula - this always modesty craze among the brightest people exactly! Two pages later (as we have seen

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yesterday) the
p. 892

Lefschetz names to Verdier, Artin, Nielsen and Wecken spoke, a real debauchery modesty for once - all not to say that this is it!

The thing I want to emphasize here, which seems to far exceed this case and these hints scam is thereof. Whether for said formula (correctly) "Lefschetz-Verdier", or "interpretation Cohomological" functions L ("coefficients"), that is **it** just makes their de-covered the **acts of creation** , also, nowadays object of general esteem (when it is not a casual derision), commonly expressed by epithets pejorative connotation as " **trivial** " " **Childish** ", " **clear** ", " **easy** ", " **conjectural** " when it is "soft mathematics", "dream", "pitch", "non-sense" and other niceties, left to improvisation gifts of each. This is the part of the work, by cons, including I always knew (and especially, it seems, never **forgotten**) that it comes "as well" and by necessity, as "stewardship" following for sure (if only we stuck with it), the party **technical** Therefore, one that is often deemed " **difficult** ", which is "to force the wrist," and I sometimes qualified as "routine work" (though without attaching any derogatory sense) - is that part of the work that is valued by consensus in effect today, and blown up to the exclusion of any other.

For me, the notion of "difficulty" is relative: something seems "difficult" as long as I have not understood. My job then is not to "overcome" difficulties sheer strength, but to enter my incomprehension enough to figure something and make it "easy" what had seemed "difficult" ⁵⁰⁷ (*). For example, unscrewing I made for the "formula functions L "as in other circumstances, unscrewing which now pass for" trivial "

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were not more
p. 893

"Easy" for me to treat the case called "irreducible" supposed "difficult". They were steps work, it⁵⁰⁸ (*). This is not because a stage comes after another, or because it is ⁵⁰⁶ (*) (April 9) There is an exception (which had first escaped my attention), with a reference-inch (at p. 90) "One of the uses essential facts by Grothendieck theory derived categories "(to set traces in cases" unorthodox "). ⁵⁰⁷ (*) The reader will note that this is a description of the approach "yin", "women" of a problem - that of "rising sea". I do not mean here that it is the only creative approach - there are also the so-called "hammer and chisel" approach "Virile" - the only one in honor (if not today the only one tolerated ...). See about these two approaches the note "The rising sea ..." (n ° 122) and about current attitudes vis-a-vis the one and the other approach, the marks "The muscle and the filler (yin yang buries (1))" and "providential circumstance - or climax" (n ° s 106, 151) and "The disallowance (1) - or recall" (n ° 152) which follows the latter. ⁵⁰⁸ (*) The case I have in mind, when I made "unscrewing" to get back to the size of situations (or relative size) **one** , apart from that of the general formula of L-functions "coefficients", mainly the two theorems change ⁷⁰⁶

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be longer, it is more "difficult". In one and the other stage, we had **an idea** : the idea of "unscrew" in one case (something we had never thought to do in situations like this, and for good reason when it comes Formulations fixed points for other correspondence that Frobenius!); in the other cases, idea probably more difficult to make, inspired by a formula of fixed points (due to Nielsen Wecken ⁵⁰⁹ (**)) more sophisticated than the original formula Lefschetz, and implemented by introducing a cutting careful coefficients beam, speaking in terms of suitable categories derived ⁵¹⁰ (***).

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The p. 894

second stage was longer, it is: when it came to developing with all the generality incumbent upon it ⁵¹¹ (*) (considering that there are other endomorphisms of a curve that Frobenius), there all had a "carpet" of non-commutative traces "on Stallinge" which eventually was sticking and after that I had to develop with care. It was long and it was "easy" - and it was also something that **had to** be made, was clear. But even find such ideas that make an "easy" job (or simply, possible. . .), Is part of me "routine work". This helps to give the charm to this work, which

in fact something else, more often than just turning crank.

Part **creative** work, by cons, is the idea **child** : that everyone should have seen for years, when it $\text{\textcircled{C}}$ not for centuries or millennia - and yet nobody saw, while she was palpable throughout this time and we had to make a wide detour around at all blows to not knock it!

When you meet such an idea, that is "stumbled upon" (this is the case to say...) Alone, or someone else tells you (as Verdier told me one a day), you feel very silly: it is failed when the same one has not seen before, so it was just the most natural thing base in étale (clean morphism, and by a smooth morphism), which constitute the two set-key that make "livable" (as written Deligne) said cohomology, and the "comparison theorem" $Rf_!$ Between the cohomology spreads and transcendental cohomology (for type schemes over the field of complex). (There is also the theorem Lefschetz (called "low") for affine morphisms.) Psychologically, it $\text{\textcircled{C}}$ once you get to reduce me to Such situations called "irreducible" I felt like it was (more or less) "won", the theorem was expected indeed "come out", and the experience has confirmed each of these: opportunities that this feeling was not wrong. Technically, however, it is the unscrewing representing the step called "easy". It is only by a kind of "Providence" that struck me then, the necessary ingredients to treat both "irreducible" in one and the other base change theorem, had been developed by me (without suspecting anything) in USG 1 for the first, SGA in 2 for the second, three and two years before. . .

509 (**) (April 10) This is my mouth besides, along other listeners SGA 5 that Deligne learned this formula "Nielsen-Wecken" and its transposition into étale, which was exempted from having to ever look at the three beautiful items (in German) of these authors (published between 1941 and 1943), and served it to the rather peculiar way we know

(see sub-note "The real math...", n ° 169 5).

510 (***) The language of derived categories is essential in this demonstration. After my departure, and until about the year the publication of the volume named SGA 4 1

2 "cohomological my students have established a tacit and effective boycott against the derived categories, which had been the key conceptual tool to develop the duality formalism ("six operations" and bidualité), in the context of the coefficients "consistent" and "discrete". Despite its crucial role in demonstrating the formula Lefschetz-Verdier, and in that also "conventional" duality of formulas in the context spreads, this formalism itself Similarly, as a mathematical set and consistent conceptual structure, was subject to the same boycott and lasts until even now (starting with the **name** same "six operations", which is still anathema).

It is possible that it is the needs of the demonstration of the trace formula, which have prompted Deligne in 1977 take a first step towards lifting the boycott on derived categories, for the exhumation in the volume-cracker of a "zero state" Skeleton of the "thesis" Verdier (text in which no mention is made of my name). On this subject the note "Sharing" (n ° 170) devoted to "Operation III", and for details on the comical case of the "thesis", notes "The gossip" and "Thesis in credit and all risk insurance "(n ° 63 $\text{\textcircled{C}}$ 81).

511 (*) (April 23) Qualified Majority, as just, "superfluous" by Illusie in his introduction to the edition-killing SGA 5 (second paragraph), becoming the obsequious echo of his famous friend Deligne, which refers (without elaborating) to "Unnecessary detail" it would be "pruned". This débinage exempts together once and for all to let the suspect drive there in one dimension a formula more general explicit evidence that it exposes to Frobenius, where he not resume not the steps of my argument while giving the impression that it is of his own. See subnote Next "The double meaning - or the art of the scam", n ° 169 7 .

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all the more obvious, the more "con" to drop the word. . . We **should have** it fall on it for a long time, sure, and then not. . .

It seems that these days and more and more, in this situation (and when in position strength, especially. . .) Is compensated by flexibility,

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when it is another (an unknown illustrates perhaps, or such "late"

p. 895

long buried. . .) Who has the misfortune of radiner (or having a cheapskate day...) With an idea like it. But my poor is **trivial** , what you tell me there! And to prove how the unfortunate this is trivial (and back into casually instead ...) we will retoucher him that in less time than it takes to say - you $\text{\textcircled{D}}$ see what it $\text{\textcircled{C}}$ like to do math! We even when something else in our sleeves that those first comers (or what left behind...)! There $\text{\textcircled{C}}$ only shot a little, one breath still pulling Hoppla and abracadabra! And **that** $\text{\textcircled{C}}$ a statement that at least has the mouth I get out of you hat, and now even a theory, not bitten worms, lis is work, yes! Young man going you get dressed, you come back when you know do the same!

I made there, without even thinking about it, the shortcut for the mishap of my "posthumous pupil" Zoghman Mebkhout, modest assistant in Lille where God knows where, to my hands "occult student" Pierre Deligne flagship between all of a select institution (and so on...); mishap occurred in the year of grace 1981 and which

also continues until today. . . That is "the operation IV", called "of the unknown service" (or "Symposium Pervert", not the name) - the most amazing four operations. (See about the notes "The Apotheosis", n ° 171.)

At the same time, writing the previous paragraph, I like a print or rewrite more least something that I had already written on another occasion. . .

I did not take long to remember - it was in the first part of Crops and Seeds, written ago Now one year, in the section " **Sport mathematics** " (the name says what he means), n ° 40 (p. 105). The difference between the episode that I mentioned and of the Symposium Pervert is that this time the role of the "unknown service" was held by "this young greenhorn who walked on my flower beds," and that the boss haughty and "sport" it was not a bad ex-student of mine, but it was none other than myself. It is While I do not think going to call mine (symbolically, in this case) another person's idea. But I can not in good faith to swear, and would have the applicant (twenty years later, but better late than never) make me know how he remembers the episode, which is a little fuzzy in my memory. he had the misfortune to redo things I knew for a long time (among others, construction of Picard diagram of an unreduced diagram "unscrewed" from the reduced case. . .), And it was "wrong" - that's what is me

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rest ; but I do not swear that his approach (in a less general framework that p. 896

mine is heard) was really completely covered by mine 512 (*).

Still, I need right here doing it again the finding of a **relationship** between an attitude that was mine at times at least, in the sixties, and the one I found among some of those who were my students. They referred me to the one I was probably disfigured image - an image that 512 (*) The opportunity has never presented to me to write and publish the net construction "relative" in question Picard by "loosening" on nilidéaux construction scheduled for a later chapter of EGA (which never saw the day). Anyway, when I speak of "ownership" of another person's idea (small or large), it is not necessarily the Plagiarism in the usual sense, when we present this idea (albeit in modified form and perfected) without indicating its origin - something that seems to become more and more common. But ownership may be that by the casual disdain, which breath fades the joy of discovery, as for the pleasure of frustrating, to the tune of "oh, it's just that..." disillusioned. This air then suggests, without having to say that what we just said we knew him, both say, historically, and if perhaps we had not bothered to explain yet is that it really was not worth the trouble. . . For those tunes there (or its predecessor), see (in the first part R and S) in "The power to discourage" (n ° 31) (recovery in Note already cited "Sport mathematical" n ° 40); and (in the atmosphere hardest 70 and 80) Burial I, "Ownership and contempt" (note ° 59) 708

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for years I wanted to challenge. But if Crops and Seeds, which was primarily a reflection on my past mathematician, had a **meaning**, it is also to make myself understood among other things, that even such that among those who were my students are more disown me, it is not for me to disavow none of them. This comes to me through them is one of the crops that I helped to sow as themselves contributed. And this realization that I draw an uncompromising pen for three weeks soon, is not an indictment against anyone, but **finding** just, and that involves me as much none of them.

(C) heritage - or scheming and creating

Note 169 6 bis (April 10) 513 (**) As everyone knows, the meaning of "trivial" word in mathematics is very relative. Here, for "trivial" I mean in terms of what was supposed to "known", ie (in this case): the formalism of six operations, and bidualité theorem (the latter remaining conjectural coach. $p > 0$ in the discrete context spreads before Deligne do not find a demonstration. . .). In terms of this formalism, the principle of demonstration is explained

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so entirely convincing in minutes (the same p. 897 time that the statement). This does not excuse, it is true, to demonstrate shaped, implying checking some tedious compatibilities.

The use in such a case, it was the author of a theorem (especially if it is important) take the trouble to write a demonstration. For Verdier, there is no doubt to me that this is the result most deepest and most significant in scope, all those in his honor (and rightly case) to bear the name (following the Weil expression goes). He has yet to this theorem as he did the theory derived categories as long as the credit was granted to him anyway, he did not see fit to do the job, and put at the disposal of all with a full demonstration.

This is an eloquent sign of a certain state of mind, which I have had occasion to speak here and there, and lately yet at the end (dated February 28) the note "maneuvers" (n ° 169). I could see he did

school. While the so-called formula (with the above reservation) "Lefschetz-Verdier" was indeed an act of creating Verdier, a time when he was still working with me and had a passion for his work, I see a direct relationship between the fact that he never had the respect to show "his" theorem, and one **life mathematician did most famous act of creation like** . The moments we are creators in the moments just where "we are worthy", ie: able to accommodate them. . . This beautiful formula, left behind by a father on the run, has also experienced the vicissitudes strange. She first made the subject of one of my first exposure (exp. III) SGA 5, 1965. Illusie was responsible for drafting it, without judging good for twelve years to give this penalty. She became then, in perfect collusion between him and Deligne (and I imagine, with the agreement of at least tacit Verdier, who Deligne grant substantial compensation) the head of the "Trojan horse" (or "Scarecrow" as I write below), maneuvered with skill, to make the incredible credible sham named "SGA4 1

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."This was fabricated for the purpose of burying the common master all three, that is to say, too, sum, the " **grandfather** " of said formula (which without my humble person and six underground operations with me, would probably not yet written a hundred years before. . .). For table manners, that the table manners!

If my dear cohomologistes former students, instead of wasting in such shenanigans to play the dwarves (They are not) are perching on

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shoulders of giants (that I am not more ...) had during these p. 898

513 This sub-rating comes from a note b. p. in the previous sub-grade non-sense "" (n "and..." ° 169 6); see reference page 886.

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Fifteen years left free play to creativity that is in them just as it is in me, surely theories crystalline coefficients, De Rham-Mebkhout and Hodge-Deligne, with that of the "mysterious functor" to the key would long since reached the "full adult stage" of the formalism of the six operations. And even (I suspect for a week or two ...), the great dream of the man who was their master, " **Motive** " is to be melody and became (in the same hands) stronghold, loot and "skeleton wave", it would as already embodied in a vast symphony (not "speculative" but "fully adult" too) and today is the **heritage of all** .

(D) The double meaning - or the art of the scam

Rating 169 7

(March 19) But we must return to me "twirling" My friend Pierre Deligne in his presentation of the famous "Formula traces". Remarkably, it nowhere states that for the application to themselves Weil conjectures (which were probably covered in the first place, otherwise exclusively, from the practical point of view), there is no need for a formula and a demonstration sophisticated - Lefschetz formula "ordinary" (v spreads) only 514 (*). And this is of course no coincidence that is precisely the presentation on cohomology class associated with a cycle that has chosen to "borrow" GAS 5, to incorporate its digest without further ado - the presentation that contains just the key-ingredient (Apart from the Poincaré duality "regular" version spreads) to establish the formula of Lefschetz @rdinary@n four shots ladle. We say, suddenly, he could well have dispensed to include the "Report" or fish nor fowl, which establishes a trace formula for the only Frobenius endomorphism (while hiding stubbornly player he could find elsewhere (!) of much more general, and also all "explicitites "). If it has yet bothered to write this" report "is probably for two related reasons. On the one First, it was clear from the sixties that the Weil conjectures, suitably reformulated terms of "weight", kept a sense for singular varieties and for "coefficients" not constant. It is true that we can then formulate fully geometric terms, without explicit reference to Shops

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ism functions of L. That is what is done, it seems to me in the article Deligne "Conjecture p. 899

Weil II "(where it is of course made no mention of a role I@ played to release the statement principal to prove it). But nevertheless arithmetic interpretation (in terms of functions L "coefficients") of geometrical-cohomological operations would certainly have a role to play, where the formula of L-functions **Generally** , the form in which I had developed was going to take a crucial place. In an optical long term, it was necessary to provide a reference in the volume called "SGA4 1

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". At the same time, while he was became apparent that the general signs of formulas (Lefschetz-Verdier design) form an important ingredient As the cohomological range, this contributed to the illusion that this volume (as announced) present

although essentially complete cohomological arsenal for the needs of "non-expert user" of l-adic cohomology.

I still have to go through the three passages that remain among the four in "SGA4 1

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"Who pretend

to give historical details about the trace formula. I mention in the order they follow in the volume. The first two are at the beginning of the volume (page 1 of the Introduction, and Page 2 of the "Breadcrumb navigation"), and are clearly intended to "announce the color." These are surely the most read also. The third is the short introduction to the chapter "Report on the trace formula." (The fourth

514 (*) (April 25) It is possible that I'm wrong here, because they have really yet seen the demonstration by Deligne the latter part of the Weil conjectures concerning the absolute values of the eigenvalues of Frobenius. It seems like the use of Lefschetz pencils lead to the introduction of L-functions more general than the ζ functions (ie the function The "ordinary").

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passage, which was discussed before yesterday, is part of the body of the same report, and is probably the least read of all.)

In the bibliography after the "Wire Ariane 4 to SGA, SGA 4 1

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SGA 5", the acronym AMS is

explained as "algebraic geometry seminar Bois-Marie", without reference (is it necessary to say)

to my person. I figure still among the directors SGA 4, SGA Director 5. This function has

to be elsewhere platonic: reviewing the main presentations SGA SGA 4 and 5 (and that

speaks more. . .) Discussed presentations Artin to Jouanolou to Houzel, Bucur, but none of me.

In the reference SGA and SGA 4 5 no indication of dates - and I have found no reference throughout the

volume that could cast doubt not already informed the reader that SGA 5 ("forthcoming in Lecture Notes") not

is, as its name suggests, indeed **subsequent** volume called "SGA 4 1

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" 515 (*). When adventure

a reference is made to a presentation in SGA 5 (generally not specified), it is well

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specified by it against p. 900

This is a "zero state" or "original" (meaning: imbitable bushy and, one suspects...). These

References GAS 5 (for an uninformed reader, which is recommended not to consult SGA

4 or 5 above SGA) are therefore (in the spirit of the same player) references to a text **later** than

he is reading. I suspect also that these uninformed readers are by far the great

majority, and (as I have written elsewhere) others begin to get old and will die a

death. . .

I quote the first page of the Introduction, paragraph 3:

"The" Report on the trace formula "contains a complete demonstration of the formula

Traces for the Frobenius endomorphism. The proof is that given by Grothendieck

in SGA 5, pruned of unnecessary detail. This report should enable the user to forget

SGA 5, we may consider a series of digressions, some very interesting. **His**

there will soon publish SGA 5 as such . "(My emphasis.)

This text either direction **opposite** served **simultaneously** with consummate skill. For one who is informed

on the history of the form in question to Frobenius, he might be surprised by the casualness of the

presentation (and this the more so, if well informed about the ins and outs of the seminar and SGA 5

his role in the formation of bright and casual author); but think that the author has at least

said the source of his demonstration. For the uninformed reader, he learned that the demonstration of the volume

he holds in his hands, is also in a subsequent text SGA 5, text due to Grothendieck and

cluttered with unnecessary details that this chap had to add pleasure to the original demonstration. The

quoted passage remains vague about it. As we saw before yesterday, playing the demo

itself, in the "Report" in question, can hardly leave no doubt that it is the brilliant author

volume "SGA4 1

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"Who is the father. Of course, it is nowhere deigns to specify who had the idea **to write**

trace formula; after all it costs nothing to write something, so we do not bother

prove it! No not referring to Verdier (who was the first, gave the demonstration of "case

crucial "that I had left open). It is not a coincidence, surely, that just when it

is about the trace formula, the heart of " **the** " Conjecture, the author makes assault "niceties"

like "unnecessary detail", "digressions" (admittedly very interesting, there is a good player or you do

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is not!) that p. 901

recommends to forget (*), and finally this recall both discrete and conclusive "its existence will published shortly SGA 5 as is ", like what does SGA 5" holds "and is publishable thanks to the "existence" of the text called "SGA 4 1

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"- which surely provided the chap in question what he

515 (*) Neither the slightest hint that could guess what the player dealt the seminar to not-to-read, which even the title ("L-adic cohomology **and functions** L") remains unknown!

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need to present a complicated way that is done simply in the original text here.

In the breadcrumb, I have already mentioned (in the sub-note "Trojan Horse" (n ° 169 3) the note "The maneuvers ") the seventeen lines of two consecutive paragraphs 2 and 3 on page 2, as" models the art of "fish in troubled waters." The second concerns precisely the famous trace formula. Both paragraphs deserve to be reproduced here in full:

"There is étale a duality formalism similar to that of duality coherent annuity. To establish, using Grothendieck resolution of singularities and the conjecture of purity (For the statement, see [Cycle] 2.1.4), established in a framework in SGA 4 XVI and - modulo resolution - equal characteristic in SGA 4 XIX. The key-points are established by another method in [Th. finitude], for type schemes ended on a regular scheme of dimension 0 or 1. Various developments are given in SGA SGA 5 5 I. III, it shows how this formalism involves the very formula of Lefschetz-Verdier.

We see that in the original version of SGA 5, the formula was established Lefschetz- Verdier that conjecturally. In addition, local terms were not calculated. For the application to L-functions, this seminar contains **another** demonstration, it completes in the case particu- bind the Frobenius morphism. It@the one in [Report]. Other references: for the statement and the pattern of unscrewing: the presentation Bourbaki Grothendieck [5]; for brief Description of the reduction (due to Grothendieck) case crucial to a case already handled by Weil [2] by. 10; for l-adic processing this case, [cycle] by. 3. "

I have already commented on the first paragraph in the note quoted (see note b. P. (**)) at page 872 this, on the hilarious "various developments are given in SGA I"). I still have to follow the twirling My friend (or at least some - there are too many!) in the second paragraph. Both 516 0 first sentences

p. 902

radinant uphill formula Lefschetz-Verdier, as if SGA 5 (and some demonstration never named in the clear, contained therein, for some trace formula. . .) Depended to death and life, clearly fall under the "method of cuttlefish": to the confusion in this is clear to fish troubled water 517 (*).

The two-way sentence-key, by cons, is that immediately following the flooding of the fish: "... This seminar contains **another** demonstration, it complements, in the particular case of mortal morphism of Frobenius "

The informed reader but pressed (and which drive is pressed...) Is startled one second by ambiguity the term "seminar" - is that APG 5, is "APG 4 1

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"- and as he knows that in SGA 5 there was a

complete demonstration is awarded once again: the author does have referred (a little vague, 516 (*) Specifically, it clearly suggests that only "Report" contains 34 pages (better) everything that could be useful in SGA 5 (which, even in publishing-killing, still has nearly 500 pages.) That@a lot of "digression" for nothing! 517 (*) It is incorrect to say that the formula of Lefschetz-Verdier was "speculative" - it was established under the assumption that has a duality formalism ("six operations" and "bidualité theorem"), and it was indeed proven under this form in 1964 by Verdier. This demonstration was given of course in oral seminar, and it is complete. It@here bidualité validity of the theorem by bus. $p > 0$ remaining "speculative", and it is established (as has been said) in the chapter "Finitude" of "APG 4 1

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As for the local terms of the formula Lefschetz-Verdier, they were "determined" no more, no less, as in formula ordinary Lefschetz (fixed not necessarily isolated points "transverse") and généralisaient conventional "multiplicities intersection "contained therein. To say that these words were" not calculated "did no more, no less sense than that the dimension of a vector space **not specified** , or the roots of a polynomial with undetermined coefficients are "non . "" calculated Calculate "in these cases, as elsewhere, means: to establish a" **case** "indicated (eg in dimension 1, for.. Formula Lefschetz-Verdier) an **equality** between two terms, none of which is more "calculated" or other known raw (p. ex. between local terms defined by Verdier, and some local invariants related to the driver Artin. . .)

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certainly ...) where we expected it refers. I almost work like this in the first reading in the month April last year (see note "The clean slate", n ° 67), but it does not yet stuck. I knew the demonstration I gave an explicit formula of traces does not merely "special case morphism of Frobenius. "Moreover, what struck me is that we had belabour (with "Arguments" -bidon) precisely on the fact that a certain presentation SGA 5 (in its "original" ! peuchère) was **not** "complete": conjectural one, terms not calculated there ... With this "complete it" well framed by two commas, this categorical opposition irresistibly suggest the uninformed reader, without he even to question that "seminar" is obviously

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the volume "SGA4 1

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"He holds in p. 903

hands - and elsewhere is told immediately, in the next sentence, where to find it: "This is the one in [Report]. "And it certainly is not reading said demonstration in the city chapter, which could after sudden spark in same drive any doubt 518 (*)!

The word "**other**" in the crucial sentence is **highlighted** something which is not in the habits of my friend. It is the only word highlighted in the two introductory texts, and I believe, also the only in the whole Volume (other titles, set, and introduced new terms). If it takes so much to bring out word, it should not be for nothing. (It is now only the thing just hang my attention.)

The effect of the term "**other**", and even more when it is well featured, is to emphasize that there **two** demonstrations of "the" Formula: one **incomplete** precisely, and we just say something about the uninviting situation with this formula of "Lefschetz-Verdier" definitely not presentable! (And in the text most technical of the famous report, watched the day before yesterday, we duly returned to the charge on this sad subject. . .).

As to guess whether or not, thanks to the results of the finite brilliant author, this method when lame even ended up walking, of late that ever know. But after that effect foil (the same, finally, that one examined before yesterday), the psychological reflex in the docile reader is even more compelling: the Instead of the method **incomplete** in a muddy seminar SGA 5 (incomplete if it does not matter even give them a precise reference 519 (**)) method which we will certainly guard never bothering, we will be entitled, in this **seminar** of good, solid stuff, good demonstration, **it complements**, which we already reaches out in the presentation especially designed for this purpose, the "Report on the trace formula," not Error we will have no difficulty to find. . . 520 (***)).

The "**seminar**" is just great - my friend is incoincable inch on this term there. However, both in the city paragraph that

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in the more technical context of the "report" extending the method p. 904

(doomed to oblivion) called "Lefschetz-Verdier" (p. 88), he still advanced new 521 (*) ie "in clear "(or at least, in chiaroscuro) **false** . In both passages indeed, it emphasizes (in the case of say) that there would be a method (which we guess is that mistakenly followed in SGA

5, God knows where its exposed "bushy". . .) For the **demonstration** of the trace formula for Frobenius, which is to **make use of the formula of Lefschetz-Verdier** . Now it has existed (before the thesis of Alibert in 1982, resulting in one dimension calculating local terms for a cohomology correspondence one insulated fixed points) two demonstrations of the case "crucial", that of Verdier and mine, which none (any more than that of Alibert) makes use of the formula of Lefschetz-Verdier! It was a

518 (*) See the sub-notes before yesterday "Real math..." (N ° 168 5).

519 (**) I have not found anywhere in the volume named "SGA 4 1

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demonstrating a formula of fixed points, the famous "cohomology theory of L-functions." It was made clear in effect (see below) that "in the spirit of this volume, it will not appeal to SGA 5...!"

520 (***) The most beautiful is in fact demonstrating Deligne is the faithful reproduction of what he had learned with other auditors at the seminar SGA 5 in 1966.

521 (*) "Again", since it was already advanced (more clearly) to "tell the fake" in the preceding paragraph, as we have seen in the sub-note "Trojan Horse" (n ° 169 3).

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delicate matter indeed and long unresolved (and seemed a little accessory), to prove that the local terms in the explicit formula released in SGA 5 (for connecting many more general than that of Frobenius) are those of formula Lefschetz-Verdier. Illusie ended up

check, according to what it says in the introduction to the edition-killing SGA 5 (p. VI), and also in the his presentation III в "local computationally" (p. 139) 522 (**).

If Deligne nevertheless so much trouble to create this false impression, it is not without reason. In Indeed, thus it creates the impression that SGA 5 (the seminar "technical digressions" "which it will not refer, in the spirit of this volume ", to do the" forgotten ") depended on this formula" conjectural " also unusable as it is (local terms not calculated sic...), that which was finally established through Deligne in volume eloquent name "APG 4 1

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"That the reader holds in his hands, which (not if only as a result) the subsequent seminar and "confused" SGA 5 depends. . . As for the last sentence of the quoted passage, beginning with "Other References" (sic), it is also a model of its kind, to avoid saying that the wave chap Grothendieck gave a demonstration complete eleven

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before (in the "future" seminar doomed to oblivion...), and that it is reproduced accurately p. 905

in "Report". The perceived need to create is that the typical person has made some waves reductions preliminary, while the difficult case is due to Weil, and brilliantly taken (by "treatment l-adic") by the author. The reference to a prestigious book Weil which the reader will have heard, in addition to an internal reference, throws out its juice - one is serious and knows his classics, or you do not! Coincidentally, no date stated in reference to the book by Weil, nor chapter or page - it does not appear that the brilliant author wants to encourage the reader to go searching elsewhere in the brilliant volume itself, where the reference suddenly becomes what is accurate (chapter, paragraph).

The famous "result already treated by Weil" Nor is anything but Lefschetz formula **ordinary** in the case of a **curve** algebraic (projective smooth connected on an alg body. closed), that arrived at Weil formulate and prove by the means available in the forties, even without having the tool cohomological (but using the Jacobian to set the H_1 missing l-adic). Relieving the formula in the case of the "abstract" algebraic geometry was then an important new idea, which has also been Weil put on the path of his famous conjecture. Once one has the cohomological formalism the Lefschetz formula in question is indeed essentially trivial. But if we had said in clear as reducing chap was reduced at room Lefschetz formula (which refers to proudly, without naming chapter "Cycle" glossy volume - Chapter 5 hacked GAS precisely. . .) - it could give the impression that said "reduction" was even a **demonstration** of the sacrosanct Formula. You would not! (*)

I can not wait to finish! It remains this introductory chapter "Report on the trace formula", loc. cit. p. 76 that here (amputated last two lines, referring to the author@exhibition section volume):

"In it, I tried to expose as directly as possible cohomology theory

Grothendieck functions L. I am very closely some of the presentations by Grothendieck to IHES in spring 1966. In the spirit of this volume, it will not appeal to SGA 5

- but two references to passages in the statement XV, independent of the rest of the seminar. "

At first sight, it seems that the author indicates his sources without concealment, speaking of "theory cohomologique of **Grothendieck** 523 0

The functions of ", and even adding that" closely following "some of my p. 906

522 (**) For the motivation of these sudden Illusie efforts, see sub-note "Congratulations - or the new style" (n ° 169 9) including pages 916-918.

523 (*) (May 11) Thus, any system today "go!" here was to refer in two distant places from each other (p. 2 and p. 88) **two** "re-714

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exposed. In a volume **normal** , there would be nothing to say. But it is also true that the **context** is part the meaning of any text. The context of the unusual volume called "SGA4 1

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"Profoundly changes the meaning this passage, for a naive reader already warned by what he read before, and which will also be built a little more, playing the "Report" itself. Afterward, he will feel that it@really kindness of generous respect to the author confused chap named Grothendieck to the credit of "Cohomology theory of L-functions", which finally seems to be reduced to an "interpretation" cohomological a bit preposterous, but after all **trivial** . It demonstrates in a small half-page barely, as a **corollary** immediately a "trace formula" which it is not tapping into, and is due of course none other than the author too modest volume.

It is said, indeed, that in his "report", the author "closely following" some presentations by the

quidam to IHES in spring 1966. Nothing is said about these surely bushy presentations, which had to lose body and good, except that the author of the volume was willing to retain his report. Is the sorites about Frobenius (where generously we will also refer to SGA 5 "led" by the same quidam), or general information on the beam-adic, or some "easy cuts" to be discussed Moreover - it is in full tide. Anyway, it should be mostly "useless details" the Report of the reading will spare us, thank God - we ask no more. the veil chap then, and we get down to **real work** !

While my friend likes to remain vague references to affecting a typical person (when it will pass over), this time the impression was yet one can not blame him for not being precise: lectures given at the IHES spring 1966. If it had been just a hair more accurate still, it would have added: presentations **at the seminar** SGA 5.

SGA 5? Is it not precisely the seminar figure (**undated**) in the bibliography at the "Breadcrumb navigation" with "to be published in Lecture Notes"? The seminar so that consisted (that©what we grew understand) to add "digressions" (some very interesting, right) and "unnecessary detail" seminar SGA 4 1

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(Really impeccable, him) that preceded it? Should not spoof, SGA 5 was not in spring 1966 are you kidding! And the best proof, here before your eyes, in black and white

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introducing p. 907

just quoted in "Report on the trace formula" (Pierre Deligne)

"In the spirit of this volume, **it will not appeal to SGA 5**".

So it©clear, right? !

(E) prestidigitators - or formula surge

Rating 169 8

(March 20) I© getting a little tired, if not exhausted by this work

I am pursuing for more than three weeks and especially (the menu) in recent days to "dismantle" patiently in these "little things" that make **all** the cool montage scam of my most brilliant student, emberlicotant the public square those who beg to be tangled (and they are legion does it believe. . .). I can not wait to finish, yes, and yet I do not regret the time I spent there, while I go on my fifty-seven years and more interesting things (or more "grim", at least) not missing not. It©like math work I called (there must be three days) "routine work" - the bit by doing it eats, although all that is known is that stewardship, yet it also knows well reductions "(!) (easy, it is something implied) made by this chap (called once, and not the second ...) without a candid reader can never suspect that this same chap has **found** and **proved** a trace formula; and his demonstration (doomed to oblivion) is faithfully reproduced in the brilliant "Report". . .

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he **must** do it! Not by some austere "obligation" or duty that would be required, but because we can not (or at least, that **I** , I can not) do without it if I want to make intimate contact with the probed thing there "enter". It is through this work then, by "rubbing" the things we want to know at length of days, weeks or years that the "known" in fact - and it is only with this knowledge, fruit of a **work** often difficult and does not look that sometimes **else** springs, this "spark" I was talking before yesterday, suddenly renews our understanding of things and the same work that we are merges.

It is through this fatigue (which is not weariness), indicating an energy that was spent, I can also fully measure the prodigious energy that my friend Peter had to disperse, in this delicate Montage-staging what this operation "SGA 4 1

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"Or" SGA4 1

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- 5 USG "I can not say how

this work of artist, oh how much more subtle than that of mathematician and involving the faculties of any other order, conscious, or the work of completely unconscious forces. And it is also a point accessory, which is his own. all ways, diversion of energy, and the investment intensity a task in the antipodes of the drive discovery - the job of gravedigger-magician - had to be staggering,

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and (it makes me doubt) is today still 524 (*). The reflex of appropriation-retraction,

p. 908

in its relation to my work at least

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and any other work that door open brand, have
p. 909

finished (during the long "escalation" that was the Burial of deceased Master) by acquiring such power over his being, they have become second nature, which would have invaded and covered his original nature, that of "child" in him, rushing to discover the world. . . More than once I have seen up close, in 524 (*) This obsession of ownership that has been on the "formula" is really crazy, in simple rational terms. On one hand, this appropriation, by necessity, must remain largely, if not entirely symbolic: a satisfaction that agrees to oneself, playing as if it **was** indeed "father," or as if we **could** actually well to believe the whole world. The fictional, symbolic, already broke out, if we remember that Deligne himself in the article "Weil Conjecture I", published four years before mounting "SGA 4 1

2 - SGA 5 "(pp. 278), writes" Grothendieck

Lefschetz proved the formula "(for correspondence Frobenius). It is true that a few months later, in presentation Bourbaki (n ° 446) in February 1974 when Serre exposes this article Deligne, the author is surprised (rightly) absence

any demonstration published the formula of Lefschetz ("since 1966 we expect the final version of AMS 5, as expected be more convincing than the exposed existing handouts ") and takes this opportunity to be ironic about 1583 pages SGA 4 that expose ("with all the necessary details, as well as many other") the formalism of *étale*.

Surely Serre did not suspect that these sarcasms to address an absent were not going to fall on deaf ears. I am convinced that they had to play their role to germinate the brilliant idea to "forget" this "gangue non-sense" etc. SGA and SGA 4 5 as the public voice seemed claim it by the mouth of Serre ... But set apart even Weil I, in terms of published texts (including the slaughter-publishing SGA 5, which remains a compelling testimony though mutilated ...)

paternity retraction does not take just standing in terms of the most basic good mathematical sense.

Add to this, as I have already pointed out that the development of the famous formula is a work of **pure routine**, once we know what we want to get. I had to put a few days to bring out the essential features - it led me to divisibility specific questions related to the driver Artin, why Serre had the answers ready, speaking elegantly in terms of Serre-Swan module. The rather long work (but also routine) was focus Careful formalism traces noncommutative inspired by the work of Stallings (who, coincidentally, had just reached me). All this is the kind of thing someone who slaughter of Deligne (or only slaughter more What modest mine) addresses per dozen in a single year!

It is true that in the writings of Deligne, "trace formula" means trace formula **in any dimension** for correspondence **Frobenius**, formula that takes care (in "APG 4 1 2 ") to distinguish between what he calls" interpretation

cohomological "(" Grothendieck, "thank you!) functions L. He presents it as a simple **corollary** of the formula traces. (In fact, in the minds of my presentation at the Bourbaki seminar of 1964, both formulas were for me **synonymous**, as equivalent expressions, one additive other multiplicative, the same relationship between the "arithmetic" and "geometric".)

Thus the real motivation (surface yet, certainly) behind this obsession around "formula", is not in the cohomological arsenal, but that of minimizing the maximum, if not erase entirely, the fact that my person played a role in demonstrating " **the** " conjecture. This is finally it, which seems to me (until the Colloquium Pervert in June 1981) as **the** largest attachment point of the conflict that has developed in my former student around the master disavowed.

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seemingly innocuous situations (no relation to the size of an "operation" as the operation "Cohomology spreads" I just look a little closer), the silent efficiency of these reflexes there, working with perfect ease in these affable candor tunes. Even before you were made you account what happened (if you really realize you never account...), it is already appropriate which was created by you in joy, in fading the first by the breath of a discreet and insidious contempt. (It is also true that is not the only one, far from it, in which I have seen this term one, which today seems to be part of the air time. . .)

But this breath that fades the beauty of what someone else has created and that joy faded, faded as the beauty of **the whole thing** and that same creative power that is in him as in all of us, to commune with the thing and knowing deeply. Certainly, this does not stop doing things "difficult" and to be admired, envied and feared. But the work within him, which I have just once see warning signs, still waiting born. She was born the day (if it is to break) where something will be collapsed and where the master-slave perched will become like his master was disavowed, a **servant** .

It©sixty pages now firmly packed (not counting a proud bunch of footnotes page), and nearly three weeks of work, I just concentrate on the only operation "Cohomology spreads." It is the most voluminous of all it is true, if not the "big" (it will be reviewed last end, in the note to well-deserved name "The Apotheosis". . .). I realize that with all that, I have not even

quite finished to go around. Little by little, this "ordering" planned, "facts updated" in a some "investigation" did start the investigation, making me look a little closer at the unusual volume called "SGA4 1

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"I had previously looked at that current.

This was also an opportunity to review again, and a more discerning eye, editing Illusie SGA-5, of sad memory. I realize now of painstaking agreement between the two thieves, putting himself Illusie at the disposal of Deligne to present an edition of SGA 5 full

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ment meets the desires p. 910

its prestigious protector and friend. This presentation SGA 5 comes like an echo, mute, spirit débinage of and contempt that spreads in the text Kick saw, and provides discreet and effective support the sham mounted therein.

The introduction to the edition-killing is written from beginning to end in order to create among the uninformed reader printing the volume "Technical digressions", the text "APG 4 1

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"Which is as central

prior (!). This impression is reinforced in presentations written by Illusie, by the abundance of references to pirate text, which he generously refers whenever it uses a result that his friend had fit to include in its digest, even when there are references "to measure" in the same volume SGA 5, or even already in SGA 4 525 (*).

I discovered the reality of a massacre in order during the reflection in the note of the same name (n ° 87)

May 12 of last year, and in the sub notes thereto. In this set of notes, I finally conducting a detailed description (if not yet complete) dismantling that had appeared to me gradually while over the past two weeks. Not having then dismantled by the menu, as I just making for nearly three weeks, the meticulous arnaquage mounted in the so-called "SGA 4 1

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" around the

Formula ", I have not yet grasped last year this aspect of careful consultation, in presenting in-seems publishing-Illusie SGA 5. To finish the operation "Cohomology spreads" alias "SGA 4 1

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525 (*) Thus, the formula of Künneth to clean surfaces (on top of any basic diagram) is an immediate corollary of base change theorem for a proper map (derived categories Version), which was the first big "break through" (" Breakthrough ") in étale in February 1963. It is indicated as such in the" matrix of non-sense "SGA 4 - we do qu@lusie would not refer to it, when there is the central text (to forget precisely these confused predecessors) that he reaches out. . .

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- SGA 5 ", I have to give some details on how this dialogue was manifested in the presentation of "formula" (fixed points) in the edition-Illusie.

I have already noted above (in the sub-grade "Good Samaritans", n ° 169 2) how did Illusie chorus to his friend, in his introduction, to give the impression that the publication of SGA 5 was suspended demonstration of the age-old formula of Lefschetz-Verdier. (This demonstration was available since 1964, and I had certainly developed in the oral seminar without that Illusie, which was responsible for Writing in 1965, considers useful for twelve years to fulfill its commitment. . .).

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I also recall that last year already (in the note cited "Massacre", n ° 87) I discovered certain vicissitudes of the presentation of original XI seminar. This presentation, inseparable from the following discussion XII

developing my version (best known until 1981) of the Lefschetz formula in dimension 1, had disappeared from the publishing-Illusie. To believe the introduction of Illusie, this presentation would have been in "the Grothendieck theory traces commutative "(providential slip for" **non-** commutative !)" generation reading that Stallings "(traces non-commutative), and would have gone (so equally providential) in a move (!). In reality, this paper developed the necessary preliminary algebraic for the description of local terms in the following description, where I develop a general method of calculating (or better, **resolution**) local term (through a formula like "Nielsen-Wecken" 526 (*)) and applied explicit cation in one dimension (suddenly Serre-Swan modules, if I remember correctly). Still that Illusie "replaces" the original exposed XI "disappeared" in a presentation "new" III B , named for the circumstance "local terms Calculations" (which, I believe, and coincidentally, was also the title of the presentation retracted!), **he is as the author** . So it makes one stone. On one hand, this is an act of **mutilation** , which may seem free at first, sowing chaos 527 (**) by this **cut** brutal, ripping a presentation to its natural context, leaving a gaping hole in its place, for the pleasure of going on

stuff elsewhere. Perhaps it is there among all the mutilations that the delicate and painstaking Illusie has subjected This was a splendid seminar (which he suddenly saw became supreme...), which afterwards I seems the most violent, the most brutally ostentative: I can slay gratis, and I slaughter - with all delicacy befitting my good education. Congratulations Illusie for this kind of work then, that you do not have learned with me, but with another, you gave yourself as a model and teacher. . .

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And a. And as second shot by the same stone, telling masterfully, Illusie happens to **retract**
p. 912

authorship of this formula of fixed points that I released in 1965, at the same time (and especially) that managed to **evade the formula itself**. It was from 1965 to 1966 "**the " good points formula fixed in one dimension**", much broader than that developed by Verdier in the year preceding Woodshole dente (otherwise it was not worth getting tired) and even more so, than the famous "Report" Deligne (Which is limited to the only correspondence Frobenius while following step by step demonstration I had open in the general case). It has been improved there are only a few years (nearly twenty years later) in the thesis of Aliberts 528 (*) treating first the case of a correspondence Cohomological 526 (*) This formula was appropriate by Deligne (without mention of myself), with the passage method of formula Nielsen-Wecken with constant coefficients (ie "standard"), to a formula of fixed points Building coefficients SOMEONE conches. On this subject the sub-note "The real math ..." (n ° 169 5, 883-884 page). So (noblesse oblige...) The same Deligne carefully refrains from any mention of the presentation XII Seminar "later" SGA 5, hence the name "Nielsen-Wecken" in the title of the presentation ("Formulas Nielsen-Wecken and Lefschetz algebraic geometry").

527 (**) This mutilation and this mess, among many others scattered through the efforts of my former student Illusie the orders of my ex-student Deligne, allows the latter to speak condescendingly about "confused state" ("though rigorous" because it is beautiful player. . .) SGA 5, in which "APG 4 1

2 "(any earlier it) is supposed to" cure "... All this under the tender eye of
Congregation of the faithful. Congratulations!

528 (*) This thesis was prepared under the direction of Verdier (no error, still the same Verdier), passed in 1981 in Montpellier or 1982 (I do not have the reference handy). It represents the culmination of ten years of work, visibly subdued. . .
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any. Illusie is arranged to present the text so that **the formula in question is practically found**: in the technical presentations magma (ripped one another) III B (sic) and XII nothing (In the introduction of one or the other or elsewhere) that draws the reader's attention on this central result of all of these presentations, and one of the largest of all the seminar 529 (**)! I admit that even I was unable to provide me with absolute certainty whether this formula is there, in SGA 5. Given the state of deliberate confusion of the text, and my distance to the subject, it would take me hours or even days of work for going on. It is the absence of any reference to the Serre-Swan modules My problem, les What (if I remember not mistaken) gave the formula that I had cleared its elegance and simplicity Conceptual 530 (***). It is precisely for the purposes of this formula that Serre had some beautiful lectures on Galois modules associated with the driver Artin, presentations were of course included in The seminar published, and that eventually

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pass profits and losses (with five or six other expo- packets p. 913
SES original family - that's no problem for Illusie Deligne and others. . .). It is possible that the formula fixed points in question is the formula (6.3.1) in the exposed XII (p. 431). Nothing glance only distinguishes dozens more copiously numbered formulas, including this one is drowned. Obviously the writer (Bucur) was overwhelmed by the task - and this is not the brilliant editor-sic Illusie broken for fifteen years to the tasks of clear and flawless essays, which would have lifted a finger to repair blunders of his friend Bucur 531 (*), who contrived to wonder. Instead, he arranged to increase confusion, making the formula-key, already found, **indistinguishable from more than Lefschetz-Verdier**, or his particular case in "Report". It is stated in the introduction to the famous exposed III B -SiC, the "father" improvised Illusie:

"The second part of this paper III B, **a lot more technical** [so do not go above not read it!], is **inspired** [!] method [!] by Grothendieck used to establish the formula Lefschetz for **some cohomological correspondence** on curves [please do not go look that!] (see XII [but that will end where to find it "the" formula!] and (SGA 4 1

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Report) [where the reader will have no trouble finding the formula, and to be informed of the identity of **true father** of it. . .]. "(My emphasis.)

Later in the same introduction, it is said that (ie Illusie, it goes without saying) applies the techniques of n ° 5 532 (**)

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"to set at $n \geq 6$, the **local terms Lefschetz-Verdier** for matches cohomology. p. 914

mologiques complex between modules are not necessarily commutative rings. "

The name given to these surreptitiously "local terms" that I introduced in 1965 for the purpose of writing the formula 529 (**). Technically, it is **the** crucial formula ("irreducible case") that can prove the famous "formula functions L" equivalent to the trace formula (in any dimension) for correspondence Frobenius. The crucial role of this formula is already certified by the same name of the seminar SGA 5 (the name is never mentioned in the text "earlier" "SGA4 1

2"):" I-adic cohomology and L-functions. "

530 (***) It is possible that here and in the next sentence, I make confusion between the structure of the formula of Euler-Poincaré (listed in the exposed X) and the Lefschetz (the presentation XII). In the formula of Euler-Poincaré in the form in which it appears in presentation Bucur (taking my oral presentation), Serre-Swan modules involved indeed explicitly.

531 (*) The last lines of the introduction (by Illusie) to editing-killing SGA 5, pretend to "pay tribute to the memory I. Bucur, died of cancer in 1976. "- a year before publishing-killing I do not know if there is a cause and effect relationship - I have no doubt on the basic honesty and loyalty Bucur, who has not missed an enormity as this edition, without at least to inform me. Still, the spirit of the operation in which fits the posthumous tribute, gives it a suspicious flavor. " Was there was with words, while there was a way more consistent with the sounds will and righteousness Ionel Bucur, to honor his memory, mitigating its blunders, instead of exploiting them shamelessly.

532 (**). On the trail, this time **not** commutative - the slip-mockery are strictly reserved to the deceased, as long as the Unless it is not there to give the reply. . .

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explicit ("Lefschetz-Grothendieck") without precisely to refer to local terms of the formula General Lefschetz-Verdier - the name is obviously chosen to maintain the desired confusion and maintained by Deligne - like what the explicit formula in question **would depend** technically that of Lefschetz-Verdier. A few lines later, we learn elsewhere, to bring joy to its height, that "the terms Local defined by Grothendieck in the Lefschetz formula (XII 4.5) " 533 (*) (which is not said above these are the very people we just baptized generously "local terms Lefschetz-Verdier") "are although local terms Lefschetz-Verdier "(but this time in a **different sense** , of course: those of formula **Generally** , "non-specific", called Lefschetz-Verdier).

For the art of fish in muddy water, following a style that I recognize all too well, it is!

Same technique confusionisme in the introduction to the volume, which reads (page VI, line 5):

"Applications to Lefschetz formulas are given in the XII exposed and III B ." (it is emphasis mine)

history especially the reader get lost in hopeless and has no chance of finding or even trying find, **the** only explicit Lefschetz formula known in dimension 1 (until 1981 at least) due (not not Illusie or even his boss Deligne but) the deceased former "manager" (sic), not appointed as just 534 (**), the seminar cheerfully massacred by his "editor" -fossoyeur Illusie.

In the original conference, the exposed XI retracted and renamed III B (with 0

a brand new father), was part

p. 915

in a series of six presentations VIII XIII centered around two themes intertwined formulas explicites Euler-Poincaré and Lefschetz treated in the same spirit, on common methods that

I was released at the seminar. There was in this part of the seminar, as in others,

a unity of purpose and clear vision. It was meticulously massacred by the care of my

former student, taking advantage of its role as "editor" -SiC a seminar wrecked by him and those of my cohomologistes other students (as posthumous thanks to the one that outside their master). With regulators

worthy of meticulous Illusie a presentation on two of les six, namely exposed IX, XI, XIII disappeared publishing-killing. The presentation IX was due to Serre and presented the theory of Serre-Swan modules - LED

tourne.que the events were taking, Greenhouse chose to withdraw his marbles and see for himself that his beautiful presentation be made available to all. The presentation was XIII explains the "Editor" in the introduction volume, redundant - apparently the "manager" unnamed could not count up to thirteen -

is awarded to the hatch! The presentation XI, we have seen, by a sleight of pass brilliant, as is found exposed III B , appendix as saying in the statement III (well, well - chance would have it...), which is ap-

peeled initially "Formula Lefschetz-Verdier" which was renamed for the purpose of confusion, "Formula Lefschetz "for short Still it." Moving "was not done at random - it will always

in the same direction, that of confusion tirelessly maintained by the perfect tandem Deligne between Illusie Formula Lefschetz-Verdier (the one that is "speculative", "local terms not calculated," but eventually

nevertheless proven by the combined efforts of Deligne and Illusie. . .), And another formula, express it, which must remain strictly secret, carefully buried in a magma numbered formulas

533 (*) (May 12) Taken aback by this unusual precision (XII 4-5) of @y@formula, I just look at the reference cited. I

is a " **conjecture 4.5** " (p. 415), which seems to relate to the ability to define local terms. We suspected that this priceless typical person would still get us one of his speculation, instead of a real definition. . .
 534 (**) While all the essential results of the seminar SGA 5, with the exception of the formula Lefschetz-Verdier and theory Serre-Swan modules (which is not included in the edition-killing), are due to me, Illusie present texts such so that for **any** of these results (not only the so-called formula "Lefschetz" lost somewhere in XII presentation...) it appears that my modest person from being a factor. Thus, he played a leading role in the operation **Eviction** of my person of SGA, long prepared by his friend Deligne eviction which finds its epilogue in note "The Funeral -" im Dienst der wissenschaft "" (n ° 175). (See also sub-note "Eviction (2)", n ° 169 1 .)
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18.5. THE FOUR OPERATIONS (a corpse)

four decimal places, insinuations that have never said anything, ambiguities carefully calculated. Congratulations yet, dear former student! So, the statement called X "Formula Euler-Poincare in étale" 535 (*) deprived of the one before it and the one following him, woefully hangs in a vacuum. Nice work, you have not wasted your time. . .

(F) The congratulations or the new style

Rating 169 9

(March 22 and April 29) I would still return to the confusion between the formula Lefschetz-Verdier and formula **occult** ,
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the undiscoverable . I have just discovered a rather hearty p. 916

"Terminology Index" in SGA 5 - one is careful, or you do not! Out of curiosity, I looked under "Lefschetz," the time "my" formula would be there. . . The only reference is to a "Lefschetz-Verdier formula (Statement III) "- which was renamed exposed elsewhere (as we saw)." Lefschetz formula "Thus reader is well aware that there is not (at least not in this volume) other formula "Lefschetz" that the so-called "Lefschetz-Verdier" (the very one he learned also that it was speculative etc., that SGA 5 depended on death and life, and that "SGA 4 1
 2

"As the name suggests here saves the day...) From beautiful Work, yes!

I continue to tour the prowess of my former student Illusie, under the guidance of my other former student Line. I take the following quote from the introduction to the volume-killing 536 (*), where "the" formula Lefschetz-Verdier, always the same, had suddenly multiplied (by virtue of the art of prestidigitation mathematical) in " **the** formulas Lefschetz" but nobody never been able to say why. It makes (Page VI, line 6):

" **The trace formula presentation XII** [which we hope no reader will ever idea going to find. . .] **Is shown independently of the general formula III of the presentation** , but is shown in (III B 6) as local terms therein are those of the formula General, **and that it implies** . "(My emphasis.)

Nothing in the hands, nothing in the pockets - incoinçable Illusie equally incoinçable his brilliant près-Chief tidigitateur! Having tracked after each other a cloud of ambiguities trompe eye all going in the same direction, I have only to note that here, in a benign detour phrase that had escaped me until now (as have escaped any reader of this introduction more than four pages 537 (**))
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it is said in chiaroscuro that some trace formula presentation XII (the reader is doing p. 917

535 (*) In the absence of stated otherwise, the reader will guess that this famous formula called "Euler-Poincare" is due to two illustrious mathematicians whose name it bears. With the above note b. p.

536 (*) See the beginning of the quote in the previous sub-note "The magicians - or formula soaring" (n ° 169 8), p.

537 (**) Zoghman Mebkhout, a careful reader but landed a little late, said he was himself deceived, persuaded the explicit formula of the fixed points (to Frobenius in any dimension, or general correspondence in dimension a) depended indeed of the general formula (unexpressed) Lefschetz-Verdier. So the assertion inch of Illusie had escaped his attention as mine - which was indeed the desired effect. . .

The confusion is reinforced by the fact that my statement Bourbaki 1974, having the formula of L-functions "coefficients" in a beam l-adic building (or what is the same, the explicit formula of the fixed points for correspondence Frobenius in such a beam) was written **before** we have explained a formula **expressed** in one dimension. At the moment I assumed that the demonstration of the explicit formula for Frobenius, in one dimension, appear as a corollary the general Lefschetz-Verdier formula - that he "had only to explain local terms." Also, in anticipation of a work remained to be done, by Verdier in this case I have in this presentation Bourbaki called this formula **explicit** "theorem Lefschetz-Verdier. "In the following, both demonstrating" Woodshole "Verdier, as mine covering a case clearly more generally, does not appeal to the general formula Lefschetz-Verdier. The situation was perfectly clear to all listeners SGA 5, at least. But for those who knew that my statement Bourbaki excluding SGA 5

as it can to find that!) is demonstrated regardless of "the formula of the presentation III (which, for the occasion, it is not entitled either to a name, in accordance with the method known as" the deliberate wave ") -... to chain in the same breath and in the same sentence (as in" **catch up** " in some ways an affirmation inch comply with safety rules. . .) With a "but we watch...." That "but" refers to complement "platonic" that person, starting with Illusie and Verdier, had still cared for twelve years, that "my" local terms - sorry, I meant "those contained therein" (wherein traces of the presentation XII formula whose author is never named in plain 538 (*))

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- these terms are those of the age-old "formula" - and vagueness about the names given
p. 918

the formulas and where to find them, suddenly gives way to exemplary precision worthy of meticulous Illusie: this demonstration a "refill" it is located in III B 6 - if a player wants to ensure that there is indeed, he will have no trouble finding it, that one!

Why this sudden interest in this identity, while the fate of the seminar 5 SGA as a whole had Illusie left (like my other students cohomologistes) perfectly indifferent for eleven years? It is order brightly chain, in the same sentence again (that is sent to or I do not know anything!) that "the formula" (Lefschetz-Verdier, not the name) **means** "of the presentation XII" (A deceased also unnamed).

This is a turn-pocus really great! My brilliant former student has sweated blood, including by working on mathematical parts but yes, to get to this brilliant result of the end of sentence apparently harmless - and yet, in the eyes of Deligne and those of his servant@capital: Formula Lefschetz-Verdier "means" one "of the presentation XII" (which we just said it was demonstrated regardless, but that@no problem for the satisfactions all symbolic of the unconscious!).

This " **implies** " is very particular nature, mathematically speaking - and I bet I@ the only one mathematician in the world, except the brilliant inventor of the gag (and perhaps his master Deligne), which is managed by enjoy the flavor. To understand it, there is no need yet to be a specialist or even a mathematician.

The two formulas, the "general" (aka Lefschetz-Verdier} and "the presentation XII" (aka the deceased not appointed) are expressed as respectively

$T = L, T = L,$

where the term T (alternating sum of traces) is the same in both formulas, while the terms L, L (amounts in local terms) have been defined ad hoc (one by Verdier in mind Lefschetz and the other by the deceased in mind Nielsen-Wecken-Grothendieck). Eleven years later, Illusie (whose editorial zeal has suddenly awakened to a leader of the sign) made a sudden effort, worthy of a better cause, to prove (Remaining sequestered until 1977), there was a misunderstanding, which was fully exploited by agreement by Deligne and Illusie

for mounting the deception (wholesale sewn white thread) "SGA 4 1

2 - SGA 5 ".

From the perspective of the imposture of the "logical dependence" SGA 5 from the text-pirate misleading name, this will not hold water anyway, even if the explicit formula depended indeed the phrase "speculative" to Lefschetz-Verdier. Indeed, as Deligne itself notes in passing in the famous "Method A" (for a reader who asks thanks - see "... The real math" n ° 169 s page 884), the "easy cuts" the unnamed chap brought back to the case of a dimension where "the ingredients of the demonstration were also all available."

All these tricks are walking, as long as they are paid to a player who is either asleep or hurry, or ask nothing better than to be tangled. To an attentive and critical reader, while the clever editing appears that it is: a shameless scam. But it seems that I am the first attentive and critical reader, for eight years that this scam has appeared on the mathematical market. . .

538 (*) For the USG 5 player is Illusie, author of the brilliant presentation III B on "local terms", which should appear as the modest father of formula never named. For a volume of the player calling himself "SGA 4 1

2", which therefore has not heard

another formula than that of "Report", the father is clearly the brilliant author of the volume, for a drive of two (If found), it will only have to play heads or tails, or give up the sponge. . .

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directly (?)

$L = L$ (and ditto for local words one by one),

history to say that the formula $T = L$ "means" $T = L$ (and thus, implicitly, that the formula

$T =$ The seminar slaughtering, crucial to the theory of L-functions, "dependent" of the formula $T = L$, which

remained "speculative" before the onset of Deligne and its angel "SGA4 1

2

"- sic)....

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The situation becomes even more ludicrous for someone a bit in the game, which realizes p. 919 nobody in the world would have thought of the preposterous definition of local terms that go into L (Those of the unnamed deceased), whether that definition was directly "blown" by the same process of demonstration of the formula $T = L$. In truth, I can say that I found a "demonstration" of formula $T = L$ **before** having set the second member L and its local terms: the last "coming out" of the demonstration, nothing less than 539 (*).

Congratulations third time Illusie, and to you as well, Deligne, which have served as a model. Together, you did work of precursors of a **new style** in mathematics. A style that already has school.

Already, it has become the "style 1980" visibly brighter future promised 540 (**). This is the style-prestidigitation, aka "the style of the gravedigger", where the art is to constantly **mislead the reader** ; the deceive not only the **paternity** of the main ideas, but also (in stride) on their affiliations and mutual relations on the scope of each, what is essential and what is incidental - and this the laudable purpose of magnifying the one to be magnified, of slag (or bury a nonchalant gesture turning a trivial sentence. . .) One to be débiné (or buried)...; and **above all** , to have the feeling a titillating **to** : lead the reader at will and by the tip of the nose, do and undo history

His knowledge **of his good**

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fun and decide what "are" mathematical things alleged to expose, p. 920

and what they are not. It is the art of always " **reign** " by gently pulling invisible (?) Son without never, ever stoop to serve. And all this in order to be always and completely "go!" : If, for extraordinary, a smarter player than another would look at it by itself, it would have the unusual idea to use (you never know ...) to his own lights and driving (it@rare, but after all it could arrive. . .) That you can never caught in the act of saying something which, **taken at face value letter** and no way out of ambiguity or double meaning, or indeed and irretrievably **wrong** .

The art of art is in this style then clause, which may seem challenging, yet. . . With Symposium perverse strange memory, four years after the prestidigitatrice virtuosity of déployements mirobolante operation "SGA4 1

2

- SGA 5 ", one could see how far this new technology and innocent can

539 (*) I says, something that also goes without saying that in all imaginable applications (not just the formula functions L, about the only correspondence Frobenius), it is the **explicit formula** $T = L$ which is **the** relevant formula. Of practical point of view, and respect the phenomena in one dimension, the formula Lefschetz-Verdier $T = L$ has a historical (or heuristic), and the same is true a fortiori (until further notice, at least) the outcome of Illusie $L = L$ (Or, more precisely, that the two types of local terms, those in L and those contained in L, are the same).

These are very obvious things that contrive yet two friends (and succeed, given these times)

to blur. This leaves reflect on the meaning that can have unbridled scientific production we are witnessing, then such as sprains to coarse point just common mathematical sense (and this on issues that closely to crucial progress for twenty-five years in our understanding of the relationship between geometry and arithmetic) pass unnoticed by each and all. . .

540 (**) See, for telling examples in this sense, some samples of "1980" style contained in the note "The Mafia "(n ° 171 2), in the writings of our great authors Brylinski, Kashiwara, Beilinson, Bernstein. Obviously, all hopes are allowed!

(May 12) Like other casual followers of the "new style", which are illustrated in the wake of the work of an obscure posthumously named student ever, I can now add Malgrange, Laumon Katz. (See note "Carte blanche to pillage" n ° 171 4 .)

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go in the retraction of an innovative work, and the shameless plundering of one who had long brought this work and had matured in solitude. . .

Hats off to the teacher and the student, and to Deligne Illusie! The artist@work! You@ earned it, and one the other, of the unanimous recognition of the whole congregation.