

Epilogue: Invisible Circles

2.19. Death is my cradle (or three brats for a moribund)

Until the appearance of the point of view of topos, towards the end of the fifties, the evolution of the notion space appears to me as an evolution essentially "continuous". It seems to continue smoothly neither jumps, from the Euclidean theorization of the space that surrounds us, and the geometry bequeathed by the Greeks, focusing on the study of certain "figures" (straight lines, planes, circles, triangles, etc.) living in this area. pace. Certainly, profound changes have occurred in the way the mathematician or the "philosopher of nature" conceived space⁶⁴. But these changes seem all in the nature of a "continuity" essential - they have never placed the mathematician, attached (like everyone else) to mental images familiar, before a sudden **change of scenery**. It was like the changes, deep maybe but gressive, which are made over the years in a being that we would have known already child, and of which we would have followed

evolution from its first steps to adulthood and full maturity. Imperative changes in certain long periods of flat calm, and tumultuous perhaps in others. But even in periods of growth or ripening the most intense, and even as we would have lost it seen for months, even years, at no time could there be any doubt, the

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hesitation: it@him again, be a well-known and familiar, that we find, it was with p. P55 traits changed.

I think I can say, moreover, that towards the middle of this century, this familiar being had already aged much - as a man who would have finally exhausted and worn out, overwhelmed by an influx of new tasks to which he was not prepared. Maybe he was already dead from his beautiful death, without anyone caring to take note of it and to make the observation. "Everyone" was still doing well in the house from one living, that it was almost as if he was still alive and well.

Now, however, judge of the unfortunate effect, for the regulars of the house, when instead of the venerable old man frozen, straight and stiff in his chair, we see a sudden swinging a vigorous kid, no higher than three apples, and who claims casually, without laughter and as a matter of course, that Mr. Espace (and you can even now drop the "Sir" at ease ...) this is **it!** If he still looked at less to have family traits, a natural child perhaps who knows. . . But not at all ! At a glance, nothing reminiscent of the old Father Space, whom we had so well known (or thought we knew ...), and of whom we were of course, in

in any case (and that was the least of the things ...) he was eternal. . .

That@the famous "change the concept of space." **That@**what I had to "see" as something obvious, from the beginning of the sixties at least, without ever having had the opportunity to formulate it before the very moment I@ writing these lines. And I suddenly see with new clarity, by the sole virtue of this

64 My initial intention in writing the epilogue, was to include a very brief sketch of some of these "changes deep", and to bring out this" essential continuity "that I see in it, I renounced it so as not to unduly Walk, already much longer than expected! I think I come back to it in the Historical Commentaries in Volume 4 "Reflections", this time for a mathematician reader (which completely changes the task of exposure).

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2. Walk through a work where the Child and the Mother

pictorial evocation and the cloud of association that it immediately arouses: the traditional notion of "space", everything as the closely related one of "variety" (of all kinds, and in particular that of "algebraic variety"), had taken, by the time I came around, such a stroke of oldness already, that it was just like if they were dead. . . 65. And I

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could say that it is with the appearance one after the other from the point of view of p. P56

schemes (and its offspring⁶⁶, plus ten thousand pages of foundations in the key) and then that of topos, a crisis-which-does-not-say-his-name was finally resolved.

In the image of now, it is not a kid, however, that we should speak, as a product of a sudden, but two. Two kids, moreover, who have between them an "air of family" irrefutable, even if they do not look like the old man. And again, if you look closely, you could say that the toddler Schemes would act as a "link of kinship" between the late Father Space (aka Varieties-in-All-Kinds) and the toddler Topos⁶⁷.

2.20. Look at the neighbors opposite

The situation seems to me very similar to that which appeared at the beginning of this century, with the appearance of the relativity theory of Einstein. There was a conceptual cul-de-sac, even more flagrant, that materialized

sudden **contradiction**, which seemed irresolvable. As of right, the new idea that was going to put order in chaos was an idea of a childlike simplicity. The remarkable thing (and consistent with a most repetitive scenario. . .) is that among all those brilliant, distinguished, prestigious people who were on the teeth suddenly, to try to "save the furniture", nobody thought about it, to this idea. It had to be an unknown young man, fresh out (if it is) from the benches of the student lecture halls, which comes from (perhaps a bit embarrassed by his own audacity ...) to explain to his illustrious elders what to do to "save the phenomena": there was more to separate the space of 68 times! Technically everything was together so for that

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this idea hatches and is welcomed. And it is to the honor of the elders of Einstein, that they knew in p. P57

effect to welcome the new idea, without too much mortification. This is a sign that it was still a great time. . .

From a mathematical point of view, Einstein's new idea was commonplace. From the point of view of our design

Physical space cons, it was a profound change, and a "change of scenery" suddenly. The first

65 This statement (which seem conclusive to some) is to be taken with a "grain of salt". It is neither more nor less valid that the one (which I take back to my account below) that the "Newtonian model" of mechanics (terrestrial or celestial) was "moribund" at the beginning of this century, when Einstein came to the rescue. It's a fact that still today, in most the "current" situations in physics, the Newtonian model is perfectly adequate, and it would be madness (view the margin error admitted in the measurements made) to go for relativistic models. Similarly, in many situations in the old familiar notions of "space" and "variety" remain perfectly adequate, without nilpotent elements, topos or "moderate structures". But in both cases, for a growing number of contexts involved in cutting-edge research, the old conceptual frameworks have become unable to express the same situations the most "common".

66 (To the mathematician) In this "offspring", I account in particular the formal patterns, "multiplicities" in all genres (and in particular, the schematic or formal multiplicities), finally the so-called "rigid-analytic" spaces (introduced by Tate, following a "master of work" provided by me, inspired by the new concept of topos, at the same time as that of formal scheme). This list is by no means exhaustive. . .

67 There is a need elsewhere, these two toddlers, to add a third youngest, appeared in less clement weather:

it's the marmot Moderate space. As I pointed out elsewhere, he was not entitled to a birth certificate, and it is in the total illegality that I have nevertheless included among the twelve "master-themes" that I had the honor to introduce in mathematical.

68 It's a little short, of course, as a description of the idea of Einstein. At the technical level, it was necessary to highlight structure put on the new space-time (it was however already "in the air", with the theory of Maxwell and the ideas of Lorenz). The not essential here was not technical, but "**philosophical**": to realize that the concept of simultaneity for distant events had no experimental reality. That's it, the "childish finding", the "but the Emperor is naked!", which made us cross this famous imperious and invisible circle which limits a Universe".

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2.20. Look at the neighbors opposite

mutation of the genre, since the mathematical model of the physical space released by Euclid there was 2400 years, and taken as such for the needs of mechanics by all physicists and astronomers since antiquity (including Newton), to describe terrestrial and stellar mechanical phenomena.

This initial idea of Einstein was then much further developed, incarnating in a mathematical model. more subtle, richer and more flexible, with the help of the rich arsenal of mathematical concepts already existing 69. With the "theory of general relativity," the idea broadens into a wide world **view** physical, embracing in one look the subatomic world of the infinitely small, the solar system, the Milky Way and distant galaxies, and the path of electromagnetic waves in a space-time curved at each point by the material therein 70. This is the second and last time in history of cosmology and physics (following the first great synthesis of Newton three centuries ago), a vast unifying vision, in the language of a mathematical model, of all physical phenomena in the Universe.

This Einstein view of the physical universe has, in fact, been overwhelmed by events.

"The set of physical phenomena" to be reported has had time to expand, since beginnings of the century! There appeared a multitude of physical theories, to account for each,

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more p. P58

or less success, of a limited package of facts, in the immense shambles of all the "observed facts". And we are still waiting for the daring boy, who will find playing the new key (if there is one ...), the "model-cake "dreamed, who is willing to" walk "to save all the phenomena at once... 71

69 This is especially the concept of "Riemann variety", and tensor calculus on such a variety.

70 One of the most striking features that distinguishes this model of Euclidean model (or Newtonian) space and time, and also the first model of Einstein ("Relativity") is that the **global topological form** of spacetime remains indeterminate, instead of being imperatively prescribed by the very nature of the model. The question of what is this

global form, seems to me (as a mathematician) one of the most fascinating in cosmology.

71 is called "unitary theory" such hypothetical theory would happen to "unify" and reconciling the many theories some of which have been discussed. I feel that the fundamental thinking that is waiting to be undertaken will have to be placed on two different levels.

◦ 1) Reflection of Nature "philosophical" about the very notion of "mathematical model" for a portion of reality. Since the success of Newtonian theory, it has become an unspoken axiom of physics that **there is** a mathematical model (or even a single model, or "**the**" model) to express the physical reality perfectly, without "detachment" or burr. This consensus, which has been law for more than two centuries, is like a sort of fossil remnant of the living vision of a Pythagoras that "All is number". Perhaps this is the new "invisible circle", which replaced the old circles metaphysics to limit the Universe of the physicist (whereas the race of the "philosophers of nature" seems definitively extinguished, supplanted hand-by-hand by computers. . .). If we want to stop there for just a moment, he It is quite clear, however, that the validity of this consensus is not obvious. There are even very serious philosophical reasons, which leads to doubting it a priori, or at least to predicting its validity with very strict limits. This would be the moment or never submit this axiom to close criticism, and perhaps even to "demonstrate", beyond all possible doubt, that it is **unfounded**: there is no single rigorous mathematical model reflecting all phenomena so-called "physical" listed so far.

Once satisfactorily identified the very notion of "mathematical model", and that of the "validity" of such a model (in the limit of such "margins of error" admitted in the measurements made), the question of a "unitary theory" or at least that of an "optimum model" (in a sense to be specified) will finally be clearly posed. At the same time, we will undoubtedly a clearer idea also of the degree of arbitrariness which is attached (by necessity, perhaps) to the choice of such a model.

◦ 2) It is **after** such a reflection only, it seems to me that the "technical" issue to reach an explicit model, more satisfactory than its predecessors, makes all sense. It would be the moment then, perhaps, to emerge from a second axiom of the physicist, going back to antiquity, and deeply rooted in our way of perceiving space itself: that of the **continuous nature** of space and time (or space-time), the "place" so that the "phenomena take place physical".

It must have been fifteen or twenty years ago, flipping through the modest volume constituting the complete work of Riemann, I had

was struck by a remark from him "by the way". He pointed out that the ultimate structure of space might well be "discrete", and that the "continuous" representations that we make of them constitute perhaps a simplification (excessive perhaps, in the long run ...) of a more complex reality; that for the human mind, "the continuum" was easier to grasp than "the discontinuous", and that it serves us, therefore, as an "approximation" to apprehend the discontinuous. This is a remark of a surprising penetration into the mouth of a mathematician, at a time when the Euclidean model of physical space

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The comparison between my contribution to the mathematics of my time, and that of Einstein to physics, p. P59

was imposed on me for two reasons: one, the other work is accomplished thanks to a **mutation conception we have of the "space"** (in the mathematical sense in one case, in the physical sense the other) ; and one and the other takes the form of a **unifying vision**, embracing a wide variety of phenomena and situations that until then appeared as separate from each other. I see a **kinship obvious mind** between his work and mine 72.

This relationship seems to me in no way contradicted by a difference of "**substance**" obvious. As I have already implied earlier, the Einsteinian mutation concerns the notion of physical space, whereas Einstein draws on the arsenal of already known mathematical concepts, without ever needing to expand it, or even to upset. His contribution was to identify, among the known mathematical structures of his time, those that were best able to 73 serve as "models" in the world of physical phenomena, rather place of the moribund model bequeathed by its predecessors. In this sense, his work has been that of a **physicist**, and beyond that of a "**natural philosopher**" in the sense understood by Newton and his

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contemporaries.

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This "philosophical" dimension is absent from my mathematical work, where I have never been ask me about the possible relations between the "ideal" conceptual constructions, taking place in the universe of mathematical things, and the phenomena that take place in the physical universe (same, lived events taking place in the psyche). My work was that of a **mathematician**, is deliberately diverting from the question of "applications" (to other sciences), or "motivations" and psychic roots of my work. Of a mathematician, in addition, carried by his very particular genius to expand the arsenal of notions at the very base of his art. That how I was brought without even to see and play, to upset the most fundamental notion of all for the surveyor:

space (and the "variety"), that is our conception of **place** even where there are geometric beings.

The new notion of space (as a kind of "generalized space" but where the points that are supposed to form "space" have more or less disappeared) in no way resembles the notion by Einstein in physics (by no means confusing, for the mathematician). The comparison is needed against with **quantum mechanics** discovered by **Schrödinger** ⁷⁴. In this new mechanics, the "point" "traditional" material disappears, to be replaced by a kind of "probabilistic cloud", more or less dense from one region of space to another, depending on the "probability" that the point is in that had never been questioned before; in the strictly logical sense, it is rather the discontinuity which has traditionally served as a mode of technical approach to the continuum.

The developments in mathematics of the last decades have also shown a much more intimate symbiosis between continuous and discontinuous structures, which was not imagined in the first half of this century. Still, find a "satisfactory" model (or, if necessary, a set of such models, "connecting" as satisfactorily as possible ...), whether it is "continuous", "discreet" or "mixed" in nature - such work will surely bring into play a great deal of conceptual imagination, and a flair consumed to apprehend and update new-type mathematical structures. This kind of imagination or "flair" seems to me rare, not only among physicists (where Einstein and Schrödinger seem to have been among the few exceptions), but even among mathematicians (and here I speak with full knowledge of cause).

To summarize, I foresee that the expected renewal (if it still has to come ...) will rather come from a mathematician in the soul, well informed of the great problems of physics, as of a physicist. But above all, it will require a man with "the philosophy to "grasp the crux of the problem." This is by no means technical in nature, but a problem fundamental of "philosophy of nature".

⁷² I do not pretend to be familiar with the work of Einstein. In fact, I have not read any of his works, and do not know his ideas only by hearsay and very roughly. Yet I feel I discern "the forest", although I never had to do the effort to scan any of his trees. . .

⁷³ For comments on the term "moribund", see previous footnote page (note page 55).

⁷⁴ I understand (by echoes that came back to me from all sides) it is generally considered that there was in this century three "revolutions" or great upheavals in physics: Einstein©theory, the discovery of radio activity by the Curia, and the introduction of quantum mechanics by Schrödinger.

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2.21. "The unique" - or the gift of loneliness

region. We feel, in this new perspective, a "mutation" even deeper in our ways of to conceive of mechanical phenomena, as in that embodied by Einstein©model - a mutation which does not consist in simply replacing a rather narrow mathematical model with the entournures, by a other similar but trimmed wider or better adjusted. This time, the new model looks so little like good old traditional models, that even the great mathematician specialist of mechanics had to feel suddenly distressed, even lost (or outraged ...). Moving from Newton©mechanics to Einstein©mechanics must be a little, for the mathematician, as to go from the good old Provencal dialect to the latest Parisian slang. On the other hand, moving to quantum mechanics, I imagine, is going from French to Chinese. And these "probabilistic clouds", replacing the reassuring material particles of yesteryear, remind me of the elusive "open neighborhoods" which

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populate the topos, such evanescent ghosts to surround p. P61

Imaginary "points", to which still hangs against all and against all imagination recalcitrant. . .

2.21. "The unique" - or the gift of loneliness

This brief excursion to the "neighbors opposite", the physicists, can serve as a reference point for a reader who (like most people) does not know anything about mathematicians, but surely heard talk of Einstein and his famous "fourth dimension", or even quantum mechanics.

After all, even if it was not intended by the inventors that their discoveries would materialize in Hiroshima, and later in both military as well as (so-called) "peaceful" atomic bidding, the fact is that discovery in physics has a tangible and almost immediate impact on the world of men in general. The impact of mathematical discovery, and especially in so-called "pure" mathematics (ie, without motivation in view of "applications") is less direct, and certainly more difficult to define. I did not know about example, that my contributions to mathematics have "served" anything, to build the least gear let©say. I have no merit that it is so, for sure, but that does not prevent that it reassures me. from that there are applications, we can be sure that it is the military (and after them, the police) who are the first to seize it - and in the case of industry (even the so-called "peaceful" industry), it is not always so better. . .

For my own guidance, or for that of a mathematician reader, it would be better to try to situate my work with "landmarks" in the history of mathematics itself, rather than to look for analogies elsewhere. I thought about it these last days, within the limits of my knowledge vague history in question ⁷⁵. During the "Walk" already, I had the opportunity to discuss a "line" of mathematicians, of a temperament in which I recognize myself: Galois, Riemann, Hilbert. If I was

better aware of the history of my art, there are chances that I would find

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extend more this line p. P62

far into the past, or perhaps to insert some other names that I know only by hearsay.

The thing that struck me was that I do not remember knowing, if only by allusion to friends or colleagues better versed in history than me, a mathematician besides me who brought a multiplicity of innovative ideas, not more or less disjointed from each other, but as parts of a vast unifying vision (as was the case for Newton and Einstein in physics and cosmology,

75 Since I was a kid now, I never get too hung up on the story (or geography matter). (In the fifth part of Harvests and Sowing (written only in part), I have the opportunity "by the way" to detect what seems to me the deepest reason of this partial "block" against history - a block that is being absorbed, I believe, in recent years.)

The mathematical teaching received by my elders, in the "bourbaki circle", was not to fix things - occasional historical references have been more than rare.

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and for Darwin and Pasteur in biology). I only knew of two "moments" in history

of mathematics, where a new vision of vast scope was born. One of these moments is that of the

birth of mathematics, as a science in the sense we understand it today, 2500 years ago,

in ancient Greece. The other is, above all, that of the birth of infinitesimal and integral calculus, at the

seventh century, period marked by the names of Newton, Leibnitz, Descartes and others. As far as I

know, the vision born in one or the other moment was not the work of one, but the collective work of a time.

Of course, between the time of Pythagoras and Euclid and the beginning of the seventeenth, mathematics had had the time to change its face, and likewise between that of the "Calculus of the infinitesimals" created by the mathematicians of the seventeenth century, and the middle of the present nineteenth. But as far as I know,

the profound changes that occurred during these two periods, one of over two thousand years and the other of three centuries, never materialized or condensed into a new vision expressed in

76 a given work in a similar way to what occurred in physics and cosmology with large

synthesis; of Newton, then of Einstein, in two crucial moments of their history.

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It would seem that as a servant of a vast unifying vision born in me, I am "unique in

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my kind "in the history of mathematics from the beginning to the present day, sorry to look like

to sing more than it seems allowed! To my own relief, however, I believe I discern a kind of

Brother potential (and providential!). I already had the occasion to mention it, as the first in the lineage

my "temperament brothers": it is **Evariste Galois**. In his short life and meteoric 77, I believe discern

the beginning of a great vision - precisely that of the "nuptials of number and greatness", in a vision

geometric new. I mention elsewhere in Crops and Seeds 78 how it two years ago, appeared in

me this sudden intuition: that in the mathematical work that at that moment exerted on me the fascination

the most powerful, I was "taking over the legacy of Galois". This intuition, rarely mentioned since,

yet had time to mature in silence. The retrospective reflection on my work that I pursue since

three weeks will surely have contributed to it. The most direct filiation I think I recognize now

with a mathematician of the past, is that which connects me to Evariste Galois. Rightly or wrongly, it seems to me

that vision that I developed during fifteen years of my life, and which continued to mature in

me and get rich during the sixteen years since I left the mathematical scene - that this

76 Hours after writing this, I am struck that I have not thought by the vast synthesis of mathematical contem-

which the attempt is made to present Mr. Bourbaki©(collective) treaty. (There will still be plenty of questions about the Bourbaki group

in the first part of Harvests and Seeds.) This seems to me to have two reasons.

On the one hand, this synthesis is limited to a sort of "putting in order" of a vast set of ideas and results already known, without bringing any innovative idea of its growth. If there is a new idea, it would be that of a precise mathematical definition of the

concept of "structure", which has been a valuable thread throughout the entire treaty. But this idea seems to me to be assimilated

rather to that of an intelligent and imaginative lexicographer, than to an element of renewal of a language, giving an apprehension

renewed reality (here, that of mathematical things).

On the other hand, since the 1950s, the idea of structure has been overtaken by events, with the sudden influx of "categorical" methods in some of the most dynamic parts of mathematics, such as topology or geometry

algebraic. (Thus, the notion of "topos" refuses to enter the "bourbakic bag" of structures, decidedly

nures!) In deciding, with full knowledge of the facts, certainly, not to engage in this "galley", Bourbaki has thereby

renounced its original ambition, which was to provide the foundation and the basic language for the whole of mathematics

Contemporary.

He has, on the other hand, fixed a language and, at the same time, a certain style of writing and approaching mathematics.

This style

was originally the (very partial) reflection of a certain spirit, living and direct heritage of Hilbert. During the fifties and sixty, this style has come to dominate - for the better and (especially) for the worse. For twenty years, he ended up to become a rigid "canon" of a "rigor" of pure facade, whose spirit that once animated it seems disappeared without return.

77 Evariste Galois (1811-1832) died in a duel at the age of twenty-one years. There are, I believe, several biographies of him. I read as a young man a fictionalized biography, written by the physicist Infeld, who had struck me a lot at the time.

78 See "The legacy of Galois" (ReS I, Section 7).

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2.21. "The unique" - or the gift of loneliness

vision is also one Galois could not help but develop ⁷⁹ if he had been in

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the neighborhood at p. P64

my place, and without that early death comes abruptly cut short a magnificent momentum.

There is another reason, surely, that helps to give me that feeling of "essential relationship"

- a relationship that can not be reduced to only "mathematical temperament" or to significant aspects of artwork. Between his life and mine, I also feel a kinship destinies. Certainly Galois died stupidly, at the age of twenty-one years, while I myself, on my seventy years, and determined to make old bones.

This, however, prevents that Evariste Galois remained in his lifetime, like me a century and a half

Later, a " **marginal** " in the formal mathematical world. For Galois, it might seem a

superficial glance that this marginality was "accidental", he simply did not have time

even "win" by his innovative ideas and his work. In my case, my marginality, while

the first three years of my life mathematician, was due to my ignorance (perhaps deliberate...) of

the very existence of a world of mathematicians, which I would have to confront me; and since leaving

mathematical scene, there are sixteen, it is the consequence of a deliberate choice. It is this choice, surely,

which provoked retaliatory a "collective will without flaws" to erase all traces of mathematics

my name, and with him the vision as I made myself servant.

But beyond these accidental differences, I believe discern this "marginality" common cause,

I essential meaning. This cause, I do not see it in historical circumstances, nor in particularism

authorities of "temperament" and "character" (which are probably as different from him to me they can

being of a person to another), and even less true in "gifts" (obviously prodigious home

Galois, and comparatively modest home). If there is one "essential relationship", I see a level

more humble, more elemental.

I felt such kinship in rare occasions in my life. It is also that I feel

"near" another mathematician again, and that was my eldest: **Claude Chevalley** ⁸⁰ . The link I mean

is that a certain "naive" or "innocence", which I have had occasion

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to speak. It is expressed by p. P65

a propensity (often not appreciated by the surroundings) to look at things with his own eyes, rather than

Through patented glasses, courtesy of some more or less large group of people, invested

authority for one reason or another.

This "propensity" or this interior attitude, is not the privilege of a mature, but that of

childhood. It is a gift received at birth, along with life - a humble and awesome gift. A donation

often buried deep, that some have retained so slightly, or maybe find. . .

One can also call **the solitude of donation** .

⁷⁹ I am convinced also that Galois would have gone much further than I have been. On the one hand because of his gifts entirely

exceptional (I have not received shares, as for me). On the other hand because it is likely that he would not like

me, allowed to distract most of his energy for endless painstaking formatting tasks as and

extent, this is already more or less for granted. . .

⁸⁰ I speak of Claude Chevalley here and there in Crops and Seeds, especially in the "Meet Claude section

Chevalley - or freedom and good feelings" (ReS I, Section 11), and the note "Farewell to Claude Chevalley" (ReS III footnote 100).

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3. A N LETTER

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May 1985

3.1. The letter thousand pages

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The text that I make you reach here, typed and printed in a limited number of copies by the care of my p. L1 university, is nevertheless neither a reprint nor a preprint. His name, Crops and Seeds, the announcement well clearly enough. I send it to you as I would send a long letter - a letter all that was personal, more. If I send it to you, instead of just me that you care knowledge one day (if you@ curious) in some volume in bookstores (if any publisher foolish enough to run the adventure...), it is because I address myself to you more than others. More than once in writing it I thought of you - I must say that it makes more than a year that I write this letter, putting me whole. It is a gift that I worry, and I took carefully writing to give what I had (at any moment) better to offer. I do not know if the gift will be hosted - your answer (or your non-response...) I will know. . .

At the same time as you, I am sending Crops and Seeds to all my colleagues, friends and (ex-) students in the mathematical world, which I have been closely related at any time, or contained in my thinking one way or another, namely, or not. There are chances that you are figures, and if you read with
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3. U DO LETTER

your heart and not only with the eyes and head, surely you will recognize you even when you are not named. I am also sending Crops and Seeds few other friends yet, scientific or not.

This "letter of introduction" that you are now reading, which you announced you and present a "letter of thousand pages" (to start...), will serve also to Foreword. This is not written yet when of this writing. Crops and Seeds is also in five games (not counting an introduction "Drawers"). I send you here the parts I (Fatuité and Renewal), II (The Burial (1) - or the dress of Emperor of China), and IV (The Burial (3) - or the Four Operations) 1. They are those which it seemed they related to you specifically. Part III (L Burial (2) - or the Key of Yin and Yang) is probably the most personal part of my testimony, and that at the same time, even more than
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others, seems to me to have a value "universal", beyond the specific circumstances surrounding its
p. L2

birth. I refer to this part here and there in Part IV (The Four Operations), which may be yet read independently and even (largely) independent of the three preceding parts 2 (*).

If reading what I sent you here encourages you to answer (as is my wish), and if it gives you also want to read the missing part, let me know. I am happy for you to send it to bit your answer makes me feel that your interest beyond that of a superficial curiosity.

3.2. Birth of Crops and Seeds (retrospective - Flash)

In this pre-letter, I would like to tell you a few pages (if possible) of what it is about in Crops and Seeds - tell you more detailed manner than said the only subtitle: "Reflections and testimony of a past mathematician" (mine past, you shall have guessed ...). There are many things in Crops and Seeds and each other will no doubt see many different things:

a **trip** to the discovery of a past; a **meditation** on the existence; a **picture** of **manners** of a medium and a time (or sliding table insidious and relentless from one period to another...); a **survey** (Almost police at times, and other bordering the cloak and dagger novel in the shallows mathematical megalopolis. . .); extensive **mathematical wandering** (which will sow more than one...); a treaty applied psychoanalysis practice (or, alternatively, a book of "**psychoanalysis fiction**"); one of panegyric the **knowledge of itself**; "**My confession**"; a **newspaper** close; a psychology of **discovery** and **creation**; an **indictment** (ruthless, as it should be...) or a **settling of accounts** in "the beautiful mathematical world "(and without gifts...). What is certain is that at no time I did bored by writing, while I learned and saw all the colors. If you leave your important tasks time to read,

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I doubt you@ bored reading it. Unless force you, who knows. . .

p. L3

Obviously, it is not directed only to mathematicians. It is also true that at times it is open mathematicians more than the others. In this pre-letter to the "letter Crops and Seeds" I would summarize and highlight especially precisely what you may concern especially as mathematical I I set aside the colleagues who are in my thoughts in one way or another, but I do not know personally. I will only send them "The Four Operations" (which relates more particularly), along with the "booklet O "consisting of the letter, and in the Introduction to Crops and Seeds (more detailed table of contents of all four first portions).

2 (*) In general, you can see that each "section" (in Fatuité and Renewal) or each "note" (in a any of the following three parts of crops and Seeds) has its unit and its own autonomy. It can be read independent pendently of the rest, as we can find interest and pleasure in watching a hand, a foot, a finger or toe or Another large or small portion of the entire body, without forgetting that this is a part of all, and that is what all only (which remains in the unspoken) which gives it meaning.

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3.2. Birth of Crops and Seeds (retrospective - Flash)

ticien. The more natural to do that will tell you just how I came, leading to another, to write one after four or five "pavement" which discussed.

As you know, I left "the great world" math in 1970, following a capital story military in my home institution (the IHES) After years of activism and anti-militarist eco style "cultural revolution", which you@ probably had some echo here and there, I disappear practically traffic, lost in God provincial university knows where. Rumor that I pass my time to keep sheep and drill wells. The truth is that apart from many other occupations, I would bravely, like everyone else, to my classes at college (that was my original little livelihood, and it still is today). It even happened to me here and there, for a few days or weeks or few months to redo math zinc strand - I have boxes full with my scribbles, I have to be the only one to decipher. But it was on very different things, at first glance at least, this I had done in time. Between 1955 and 1970 my favorite theme was cohomology, and more Specifically, the cohomology of varieties of all kinds (algebraic, in particular). I considered having done enough in that direction so that others are doing without me, and for that matter of the math, it was time to drive change. . .

In 1976 appeared in my life a new passion as strong as had once been my passion mathematical tick, and also closely related to it. It is the passion for what I called "meditation" (since must be names to things). This name, as would any other name here, can not fail to arouse the innumerable misunderstandings. As in mathematics, this is a work of discovery. I speak to about it here and there in Crops and Seeds. Still, that apparently there was enough take care for the rest of my days. And more than once, in fact, I have grown that mathematics was the past and now, I was not going to take care that more serious things - I was going to "meditate".

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Yet I ended up going to the obvious (there are four) that mathematical passion was not p. L4 off either. And even without knowing how and to my own surprise, I who (for nearly fifteen years) was no longer thinking publish a line of my life math, I saw myself suddenly embarked on writing a math book that obviously did not finish and that was to have volumes and volumes; and As I was there, I was going to swing that I thought I had to say math in a series (infinite?) books to be called "Reflections Mathematics" and speak no more.

That was two years ago, the spring of 1983. I was then already too busy to write (Volume 1) "At the Fields of Pursuit ", which also had to be Volume 1 of" Reflections "(mathematics) to ask me questions about what happened to me. Nine months later, as it should be, this first volume was completed as saying there were only introduced to write, read it all, annotations - and the impression. . .

The volume in question is still not finished by now - he has not moved a muscle since a

year and a half. The introduction was left writing has surpassed twelve hundred pages (typed) when this is over real thing there will be fourteen hundred well. You will have guessed that said "introduction" is other than Crops and Seeds. At last, it is supposed to form the volumes 1 and 2 plus portion of the volume 3 of the famous "series" provided. This suddenly changed its name and be called "Reflections" (For short, not necessarily mathematical). The rest of the volume 3 will consist primarily of mathematical texts, now burning more to me than the fields of proceedings. It can wait next year for annotations, indexes, plus, of course, an introduction. . .

End of the first act!

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3. U DO LETTER

3.3. The death of the boss - sites abandoned

It is time, I feel, to give some explanations why I left so abruptly in a world which, apparently, I had felt at home for more than twenty years of my life; why I had the idea strange "return" (as a ghost...) when we had well passed me during these fifteen years; and why finally an introduction to mathematical work of six or seven hundred pages reached by to twelve (or fourteen) cents. And here, too, going into the thick of it, I probably annoy you (Sorry!), Or even be angry. For no doubt that, like me once, you love to see "rose" the middle which you belong, where you have your place, your name and everything. I know what it is. . . And there going to squeak a little. . .

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I speak here and there in Crops and Seeds of episode I left without much dwell. This "start"

p. L5

it appears rather as an important watershed in my life mathematician - is compared to "point" that constantly lie the events of my life mathematician as "before" and "after". It took a **clash** of great strength to tear myself away from an environment where I was strongly rooted, and a "trajectory" sharply drawn. That shock came through confrontation, in an environment in which I was strongly identified in some form of corruption on which hitherto I had chosen to close their eyes (refraining simply not to participate). Looking back, I realize that beyond the event, there was Yet a deeper forces at work in me. It was an intense **need for inner renewal** .

Such a renewal could be accomplished and continue in the warm atmosphere of scientific incubator a luxury institution. Behind me twenty years of intense creativity and mathematical investment mathematical disproportionate - and at the same time also, twenty years of spiritual stagnation in "isolation". . . Without realizing it, I was choking - it the sea air that I needed! My departure" providential marked the sudden end of a long stagnation, and a first step towards a balancing of deep forces in my being folded and screwed into a state of intense imbalance, frozen ... The start was, truly a **new beginning** - the first step on a new journey. . .

As I said, my mathematical passion was not extinct so far, it has found expression in reflections that have remained sporadic in ways quite different from those that I had plotted "before". As for **the work** that I left behind me, the "before", as that published in black and white that the more important perhaps, who had not yet found the way of writing or published text - it could well seem, and it seemed to me, in fact, she had separated from me. Before last year, with Crops and Seeds, the idea had never occurred to me to "ask" so slightly on the scattered echoes me that come back here and there. I knew that everything I had done in math, particularly in my period

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"geometric" from 1955 to 1970, were things that **had to** be made - and the things that I

p. L6

views and interviews, were things that **had to** occur, it **was necessary to** pull the open. And also, that the work I had done, and that I had made do was work well done, work where I was put me whole. I had put all my strength and all my love, and (so it seemed to me) it was now self - a lively and vigorous thing - who did not need that I materne. From that side, I left the spirit perfectly quiet. I had no doubt that these written and unwritten things I left, I let in good hands, who would know that they ensure déployent, they grow and multiply according to their own nature alive and strong things.

In these five years of intense mathematical work, had hatched, matured and grew in me a broad **vision**

This is the unqualified cooperation, "establishment" in mind, of all scientists of all countries with military aircraft, as a convenient source of funding, prestige and power. This question is barely touched in Incidentally, once or twice in Crops and Seeds, for example in the note "Respect" the April 2 (n ° 179 pages 1221-1223).

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3.3. The death of the boss - sites abandoned

unifying, incarnating himself in a few **key ideas** simple. The vision was that of a "geometry arithmetical métique" synthesis of topology, geometry (algebraic and analytic), and arithmetic, which I found a first embryo in the Weil conjectures. It was she who was my main source of inspiration in these years, which to me are those especially where I cleared the main ideas of this geometry new, and where I fashioned some of these key tools. This vision and these key ideas are Devel- bare to me like second nature. (And having ceased all contact with them for nearly fifteen years, I now see that this "second nature" is still alive in me!) They were for me so simple, and so obvious, it was obvious that "everyone" had assimilated and endorses gradually as the same time as me. It is only recently, in the last months, that I realized that neither the vision nor the few "key ideas" that had been my constant guide, only found spelled out in any published text, except at most between the lines. Above all, this vision I had grown communicate, and these key ideas which are, still today, twenty years after reaching full maturity, ignored by all. It@me, the worker, and the servant of those things I had the privilege to discover who am also the only one in which they are still alive. Such a tool and another that I had shaped, is used here and there to "break" a problem deemed difficult, as it would force a safe. apparently solid tool. But I know him another "force" although that of a crowbar. It is part of a Whole, as a member

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is part of the body - p. L7

an All which it is derived, which gives it meaning and from which it draws strength and life. You can use a bone (if large) to fracture a skull, it@a done thing. But that is not his real function, its reason for being. And I see these scattered tools seized some and the others, like bones, carefully skinned and cleaned, they would have torn from a body - a living body they would pretend to ignore. . . What I am saying in terms carefully considered, after much thought, had to be seen by me little pretty and diffusely, over the years, at the unformulated who still seeks to take shape in thought and conscious images, and the clearly articulated speech, I had decided that this past, basically, only concerned me. The echoes that reached me from time, while they were filtered, were yet eloquent, provided me to dwell a little. I grew myself a worker among others, bustling about five or six "yards" ⁴ in full swing - a more experienced worker might, the elder who formerly had worked only in those places, for many years, before there comes a relief welcome ; the eldest, either, but at bottom no different from others. And now, the same party, it was like a Masonry company that would bankrupt, following the unexpected death of the boss: overnight, in other words, the yards were deserted. The "workers" have left, each carrying under his arm the pocket odds he thought he use his home. The body was gone, and there was no reason now he continues to work to tire. . .

This is, again, a formulation which is decanted for reflection and investigation is continuing on more a year. But surely it was a thing perceived "somewhere" already in the first years after my departure. Putting aside the work of Deligne on the absolute values of the eigenvalues of Frobenius (the "Prestige issue" as I understood lately. . .) - when I happened from time to time to meet one of my old relatives, with whom I had worked on the same sites, and I asked him and so. . . ? ", It was always the same eloquent gesture, arms in the air

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as if to ask pardon. . . Visibly p. L8

ment, all were busy with more important things than those who held my heart - and obviously, Also, while all were busy with busy and airs, not much was being done. The essential

⁴ I speak about these "sites" deserted, and finally passes the review, the following notes "The sorry yards" (n ° s 176 @ 178), of it three months ago. A year before, and before the discovery of the burial, there was already talk in the first note which I resume contact with my work and the fate that was his, in the note "My orphans" (n ° 46).

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had disappeared - a **unit** that gave meaning to the subtasks, and **heat** also, I think. He stayed a scattering of spare tasks of a whole, each in his corner brooding his little nest egg, or making grow somehow.

Even as I wanted to defend myself, it pained me to glimpse sure that everything stopped short; not to hear or patterns, or topos or six operations or coefficients Rham or those of Hodge, neither the "mysterious functor" that would link them in the same range, around De Rham coefficients, the coefficients l-adic for all primes, or crystals (if not to learn that they are still the same) or "standard conjectures" and others I had clear and that, obviously, represent crucial issues. Even the extensive work foundations

started with Algebraic Geometry elements (with the tireless support of Dieudonné), he would almost enough to continue the momentum already achieved, was left behind: everyone content to settle in the walls and in furniture that another had patiently assembled, installed and bricks. The workers party, it would occur to anyone to roll up his sleeves and turn to hand trowel to construct many buildings that remained to build the **houses**, good to live for oneself and for all. . .

I could not help but still, again, to chain with fully conscious images, which are clear and are reassembled by virtue of a process of reflection. But there is no doubt to me that these pictures-there must already be present in one form or another, in the deep layers of my being. I had already felt the insidious reality of a **burial** of my work along with my person, who came to me suddenly, with irrefutable strength and with that same name, "The Burial", April 19 last year. On the conscious level, against, I would hardly thought offend me nor to grieve. After all, "close" once or not, it only looked at the person, what he chose to take his time. If what had seemed to motivate or inspire once only inspired him more, that was his business, not mine. If the same thing seemed to happen, with a perfect set, all my ex-students without exception, it was still there the case of each of them separately and

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I had other fish to fry than to seek

p. L9

what sense it could have, and that all! As for the things I had left, and to which a link deep and ignored continued to connect - even though they were obviously abandoned on sorry these sites, I knew very well, they were not of those who fear "injury time" or fluctuations modes. If they were yet entered the common heritage (as he had me Yet once seemed), it may fail to take root sooner or later, in ten years or a hundred, mattered little to the bottom. . .

3.4. A burial wind. . .

Yet it pleased me throughout these years of evading the diffuse perception of a large burial scale, it did not fail to remember stubbornly to my good memory, in other faces and less innocuous than that of a mere disaffection for work. I learned little by little, I would strongly say how, several concepts that were part of the forgotten vision, were not only fallen into disuse, but became, in a beautiful world, subject to scorn condescending. This has been the case, in particular, the crucial unifying concept of topos, in the heart of the new geometry - the same one that provides common geometric intuition topology, algebraic geometry and arithmetic - it also allowed me to identify both the cohomological tool spreads and -adic that the main ideas (more or less forgotten since, it is true...) of the crystalline cohomology. As a matter of fact,

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3.4. A burial wind. . .

it was my same name, over the years, which insidiously mysteriously became subject of derision - as a synonym of muddy bombinages to infinity (such as those on the famous "topos", precisely, and these "Reasons" which he drew down your ears and that nobody had ever seen. . .), Hair cutting four thousand pages in length, and bloated and gigantic chatter about that, anyway, everyone already knew forever and without having waited ... A little about these tones there, but muted, by innuendo, with all the delicacy that is required "among people of high flying and exquisite company".

During the discussion continued in Crops and Seeds, I think I hit the nail on the forces deep at work in each other behind these songs of derision and condescension to a work whose scope, life and breath, escape them. I also discovered (besides the features my special person that marked my work and my destiny) secret " **catalyst** " that prompted

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these forces to manifest in this form the casual contempt before the eloquent signs of creativity p. L10 intact; Grand Officiant for Funerals, in short, in this Burial muffled by derision and contempt. strange thing is that, of all that was closest to me - as the only who has assimilated a day and endorsed a vision, full of life and strength intense. But I am anticipating. . . In truth, these "discreet derision flashes" returning here and there, did not reach me off measured. They remained somewhat anonymous until a three or four more years. I saw certainly a sign of the sobering times, but do not put me in because really, and aroused in I fear nor worry. One thing against that touched me more directly, were the signs of taking distance from myself, from here and there from many of my old friends in the mathematical world, friends which (notwithstanding my departure from a world that was common to us) I continued to feel connected by bonds of sympathy, in addition to those created by a shared passion and a some common past. Again, if every time I have been pained, I am myself yet hardly stopped, and the thought never occurred to me (as far as I remember) to make a comparison between these three

series of signs: the abandoned sites (and the forgotten vision), the "mockery of wind", and taking away the number of those who were friends. I wrote to each of them, and I have not received a response from any. This was not uncommon elsewhere, now that the letters I wrote to old friends or students on things who held my heart, remain unanswered. New times, new habits - what could I do? I have confined myself to refrain from writing them yet. And yet (if you are one of those) this letter that I am writing, it will be the exception - a word that is offered to you again - to you to see if you welcome this time, or farms you there again. . .

The first signs of a shift away from some old friends over my person back, if I am not mistaken, in 1976. It was also the year where it began to appear another "series" signs still, he remains to speak, before returning to Crops and Seeds. Rather, the latter two signs series appeared together then. Right now as I write, it appears to me that they are in fact inseparable, these are basically two aspects or "faces" several of the same reality, barging in that year lived in my own field. For the area I was going to speak now, there is a "plea" systematic,

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discreet and unanswerable reserved by p. L11

Consensus flawless " 5 to some students-and-assimilated to a **close** in 1970 who, through their work, their style 5 This "consensus flawless" is mentioned sporadically here and there in Fatuité and Renewal, and eventually became the subject of a detailed testimony and reflection in the next section, The Burial (1), with the "Procession X" or "The Van Funeral "trained" note coffins "(n o s 93-96) and the note" The Gravedigger - or the whole Congregation "This closes. this part of Crops and Seeds, and is also a first result of this "second wind" of reflection.

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work and inspiration, clearly bore the mark of my influence. It is perhaps this occasion also that, for the first time I have seen this "discreet derision breath" who, through them, was a certain style and a certain **approach** of mathematics - a style and vision that (according to a consensus was apparently already become so universal in the mathematical establishment) **had not Instead of being** .

Again, it was clearly perceived at the unconscious level thing. She finished well in the same year yet to win in my conscious attention, even after an absurd scenario (illustrating the impossibility to publish a visibly brilliant thesis) was repeated five times in a row, with the burlesque obstinacy a circus gag. Thinking back now, I realize that a certain reality "made me sign" then with kindly insistence, while I pretended to turn a deaf ear, "Hey, look at gawk, watch a little what happens there right under your nose, it concerns you, but yes. . . ! ". I am shaking a little, I watched (the space of a moment), half dazed and distracted half: "Oh yes, well, a bit strange, although it seems wants someone there, something that@hard to pass decidedly, and with a set as perfect yet, it@even hard to believe my word. "

It was even to the point somewhat believable, I am eager to forget and the gag, and the circus. It is true I had plenty of other interesting occupations. That did not stop the circus to remember my good memories in the years yet - either in shades gag now, but in those a secret delight in humiliating, or that of the fist hard blow in mouth full; it is close to that distinguished between people and the punch here takes most distinguished forms also, necessarily, but equally effective, left to the creativity of distinguished people in question. . .

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The episode I felt like "a punch in mouth full" (another) is in October

p. L12

1981 6 . This time, and for the first time since reached me insistent signs of a mind nou-veal, I was suffering - more highly probably that if it was me it had hit, rather than another cash, I had an affection. It was a little figure of student, and it was more of a mathematician remarkably talented, and who had to make beautiful things - but this is a detail, after all. It was not a detail, by cons is that three of my students "before" then were directly fixed to a deed by the person concerned (and not without reason) as a humiliation and an affront. Two other of my former students had already had the opportunity to treat condescendingly in plush sending people walk a traîne-Learned 7 . Another student was also still suit three years later (and in style "kick fist in the mouth "again.) - but that I did not know yet of course What interpellait me then was more than enough. It was as if my past mathematician, never looked suddenly taunting me one, hideous grin by the person in five among those who were my students become important characters, powerful and disdainful. . .

It was then when ever ask, to probe the meaning of what interpellait me with a sudden such violence. But somewhere in me it was decided (but never the thing has got to be told...) That what happened "before" did not concern me at the bottom, there was no place me to dwell; if it seemed

Now call me in a voice I did not recognize too well - the time of contempt - there had decidedly maldonne. And yet, I was tied with anguish for days and possibly weeks, not only take note. (This is the last year alone by writing Crops and Seeds me returns on this episode, I ended up taking knowledge of this anxiety had been taken under qu@pparue control immediately.) Instead of making the finding and to sound the way I am restless, I have written to 6 This episode is recounted in the note "Coffin 3 - or jacobians too much on" (n ° 95), including 404-406 pages. 7 This is discussed in passing in the note cited in the previous footnote page. 80

3.5. The trip

right and left, "the letters that were necessary." Interested parties even bother to answer me, of letters evasive and it goes without saying that entered does nothing in the background. The waves have calmed down and everything is

back in order. I hardly had to think again before last year. This time, however, he remained as injury, or

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as a painful splinter, rather, that avoids touching; a thorn that **keeps** p. L13 this injury just waiting to close. . .

It was there, surely the most painful experience and the most painful I@e experienced in my life mathematician - when I was able to see (not yet consent to really **take notice** what my eyes were seeing) "as student or former companion that I liked, taking pleasure in crushing discreetly ment as another that I love and in whom he recognizes me. "She then marked more strongly, surely, that Yet the crazy enough discoveries I made last year, and (to a superficial glance) can everything else seem incredible. . . It is true that this experience had resonate more others in the same tones but less violent, and instantly had a little "past to the ace."

This makes me remember, too, that that year 1981 was also one of a drastic turning point in my relationship alone among the former students with whom I am kept in regular contact after my departure hand, and also that for fifteen years had been one of "privileged partner" for me, the mathematical level. This is the year where indeed "signs of disdain assignment" that were apparent rus for some years now s "are suddenly so brutal facts" so I stopped all communication mathematics with him. It was a few months before the episode-kick-punch sometimes. In hindsight the coincidence seems startling, but I do not think I did then any rapprochement. It was stored in of "traps" separated; lockers, which someone, moreover, said they do not really firing at accordingly - the cause was heard!

And that reminds me, too, that in June of that year 1981 yet, had already held a bright **Symposium** , memorable in more ways than one - a conference that will have deserved to make history (or in what remains ...) under the indelible name "Symposium Pervert". I met him (or rather, he tumbled over!) May 2 last year, two weeks after the discovery (April 19) of the Enter-surely in the flesh - and I realized immediately that I had come across " **the Apotheosis** ." The apotheosis a funeral, certainly, but also, an **apothecosis** of the **contempt** of which, for over two thousand years our science there was tacit and immutable foundation of ethics of the mathematician: namely, that rule elementary, not to present as his own ideas and results taken another. And taking note the moment

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This remarkable coincidence in time between two events that seem to na- p. L14 ture and reach very different, I am seized of view be here the deep and clear link between the **respect** of the **person** , and the basic ethical rules of an art or a science, that make his other exercise but a "rat race" and all those who are known to excel and give them tone, something other than a "mafia" unscrupulous. But again I anticipate. . .

3.5. The trip

I think I@e pretty much toured there, the context in which is placed my "back to math" and led to another, writing and Crops Seeds. This is the end of March last year, in the latest Section Fatuité and Renewal ("The weight of the past" (n ° 50)), I finally think to wonder about the reasons and the meaning of this unexpected return. In terms of "reasons", the highest of all surely was the impression, diffuse and compelling at the same time, these strong and vigorous things I had grown

8 It is about this episode in the note "Two turning points" (n ° 66).

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3. U DO LETTER

formerly assigned between loving hands - it@in a tomb cut the benefits of wind, rain and

the sun they have languished during the fifteen years I had lost sight of " 9 . I can understand, little little and with never before today I had thought to tell me, that it would be none other than me who would finally jump these rotten planks, holding prisoners living things do, not to rot in closed coffins, but to thrive outdoors. And these tunes compunction false and insidious mockery around these coffins padded and bloated (like the late deceased, no doubt ...) have had also "eventually awaken in me a combative fiber that was somewhat dormant in the last decade "and the desire to get into the fray... 10 .

Thus, there are two years than was originally planned as a quick survey of a few days or weeks to break everything, from one of these "sites" left behind, became a great mathematical soap in N volumes, inserting in the popular new series "Reflections" ("Mathematics", waiting to prune this unnecessary qualifier). The moment also where I knew I was writing a math book for publication, I also knew I would join, and more introduction of a "mathematical" more or less in line with the practices, another "introductory"

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more
p. L15

more personal. I felt it was important that I explain my "return", which was way back in **the middle** , but the "back" only to intense mathematical investment and publication of mathematical texts from my pen, indefinitely. Also, I wanted to explain about the spirit in which I am now writing maths, very different in some respects from the spirit of my writings before I left - mind "diary" of a journey of discovery. Besides there were other things I had on the heart, related to them of course, but I felt more still essential. It was understood to me that I was going to take my time to say what I had to say. These things, still diffuse, were inseparable for me that went sense to have these volumes I was about to write, and "Reflections" in which they would fit. There was no question of the slip away in a hurry, as apologizing to abuse the precious time of a busy reader. If there were things in "In the Fields of Pursuit" he was good for him and for all, it takes knowledge, They were precisely those that I reserved to say in this introduction. If twenty or thirty pages there should be enough to say, I would put forty or fifty, that©no problem - besides I obligeais person to read me. . .

Thus was born Crops and Seeds. I wrote the first pages of the planned introduction in the month June 1983 to a low point in writing the first volume of The Fields of Pursuit. Then I have given that in February last year, when my volume was virtually complete for several months 11 . I reckoned that this introduction would be an opportunity to enlighten me on two or three things that remained a tad blurry in my mind. But I had no suspicion that it was going to be, as the volume I had just written a **journey of discovery** ; a journey into a different world even richer and of larger dimensions than the one I was going to explore in the volume and written in those were to follow. It©the days, weeks and months, without much to me to realize what was happening, that continued this new journey, the discovery of a past (stubbornly eluded for over three decades. . .) And myself and links that connect me to the past; at

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Discovery also some of
p. L16

those who were close to me in the mathematical world, and I have so little known; and finally even in the 9 Quote from the note "The melody in the tomb - or sufficiency" (n ° 167), page 826.

10 See "The weight of the past" (Section n ° 50), especially p. 137. (**).

11 In the tempsj@vais had a good month to think about "structural surface" for a pseudo-straight system, obtained in terms the set of all possible "relative positions" of a pseudo-right with respect to such a system. I also wrote "The Outline of a Program" which will be included in Volume 3 of Reflections.

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3.6. The shadow side - or creation and contempt

stride and, moreover, a journey of mathematical discovery, while for the first time in fifteen Twenty years or 12 , I was taking leisure return to some of the questions I had left, burning at the time I left. I can say, in short, these are **three** voyages of discovery, closely intertwined, that I continue in the pages of Crops and Seeds. And none of the three is completed with the end point, the page twelve hundred and some. The echoes, already, that will collect my testimony (till and including the echo by silence. . .) Will be part of the "suite" of travel. As for his eventual journey surely is one of them that are never completed - even if it is the day of our death. . .

And here I am finally back to the starting point: tell you in advance, if possible, "of what it is about" in Crops and Seeds. But it is also true that without having even tried, the previous pages you already have said more or less. It will be more interesting, perhaps, to keep going and **telling** , rather than "announce".

June 1985

3.6. The shadow side - or creation and contempt

The preceding pages were written in favor of a short "hollow point" last month. In the meantime, I finally finished putting the final touches to the "Four Operations" (the fourth part of Crops and Seeds) - it still remains for me to end this letter or "pre-letter" (which she also pretended to take prohibitive dimensions. . .) So that everything is finally ready for the strike and for duplication. I could not believe Moreover, in force for almost a year and a half I am "about to finish" those famous notes! In putting myself in this "introduction" of a bit unusual nature for mathematical work in the month of in February last year (and already the year before, in June), there was (I think) three kinds of things especially on which I had so wanted to express myself. First, I wanted to explain my intentions returning to a mathematical activity, and the spirit in which I had written the first volume of "A Continuation of the Champs "(I had just finished state), and the spirit

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also where I intended p. L17
continue a journey of exploration and wider mathematical discovery yet, with "Reflections".

It would be more for me now to introduce meticulous and foundations to the nines for some new mathematical universe in labor. It would be "log books" instead, where the work is continue from day to day, without anything to hide and as it goes **really**, with its failures and its forages, its insistent flashbacks and also his sudden leaps forward - work drawn forward irresistibly day after day (and notwithstanding the countless incidents and contingencies), as by an invisible thread - by some elusive vision, tenacious and safe. A working groping often, especially in these "sensitive time" where outcrops, barely perceptible, some intuition still nameless and faceless; or from some new travel, the call and the pursuit of some first ideas and intuitions often elusive and reluctant to let enter into the mesh of language, whereas it is precisely the right language to enter with delicacy that often is lacking. This is such a language, before anything else, it is then to to condense out of apparent nothingness impalpable mist. This is still only approached before only to be glimpsed, much less "seen" and touched the finger gradually settles the imponderable is emerges from his coat and gray mists to take shape and flesh and weight. . .

It is that part of the work, poor appearance if not (many times) half-assed, which is 12 In the fifties and sixties, I had often suppressed my urge to throw myself to the pursuit of such juicy issues and burning, cornered as I was by endless foundations spots, nobody would have known or wanted to continue my place, and person after my departure had not the heart to continue. . .

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also the most difficult part and the most important - where it truly, something new is its appearance, the effect of intense attention, a concern, a respect for this fragile thing, infinitely delicate, about to be born. This is the creative part of all - that of the design and a slow gestation in the warm darkness of the feeder matrix, from the invisible dual gamete original, becoming shapeless embryos and turning over days and months, by an obscure work intense, invisible and apparently in a new being in the flesh.

This is also the "dark", the "yin" or " **female** " work of discovery. The complementary aspects mentary, the "clarity" or "yang" or " **male** " is akin rather to work with hammers or mass on a sharp chisel or a corner of good tempered steel. (Tools already ready for use, and efficiency that has already proven ...) The one and the other aspect is its purpose and function,

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inseparable symbiosis with each other - or rather, these are **the wife** and **the husband** of the couple insepara-
p. L18

luble the two original cosmic forces, whose embrace constantly renewed constantly resurrected obscure labors creators of the conception, gestation and birth - the birth of **the child**, of the new thing.

The second thing I felt the need to express myself in my famous "introduction" personal tional and "philosophical" in a mathematical text was about the nature of creative work precisely I had been already has, for years, that nature was generally ignored, obscured by shots to all comers and repressions and ancestral fears. How much it is so, I found out after only gradually over days and months, while during the reflection and the "investigation" continued in Crops and Seeds. This is from the "kick" of this reflection, Over the next few pages dated June 1983 I was first struck by the scope of this fact seemingly innocuous, yet stunning, provided only that it stops so slightly: this part "creator of all" which I have mentioned in the work of discovery, **practically shines nowhere** in the texts or speeches that are supposed to present such work (or at least its most fruit tangible); be it textbooks and other educational texts or articles and original papers, or and oral presentations during the seminars etc. There is, for thousands of years it would seem, from the beginning

even mathematics and other arts and sciences, a kind of "conspiracy of silence" around these " **Unspeakable toil** " that will herald the emergence of any new idea, big or small, from renew our knowledge of a portion of this world, in perpetual creation, where we live. In short, it seems that the repression of the knowledge of this aspect or that stage, the all crucial in any work of discovery (and in creative work in general); is so effective point so much internalized by those who even know yet such work first hand, often would swear that even they have eradicated all traces of their conscious memory. A bit like a puritanical society to the death, a woman would have wiped her memory, in relation to each of these children she makes a point of nose and wipe, the time of the embrace (suffered against the heart) which made him conceive the long months of pregnancy (experienced as an impropriety), and the long hours delivery (endured as an unsavory ordeal, finally followed by an issue).

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This comparison may seem exaggerated, and she may be indeed, if I apply what I

p. L19

today reminded of the spirit that I have experienced in the mathematical middle of which I was myself part there are still twenty. But during my reflection in Crops and Seeds I came to realize, and vividly in these last few months especially (with writing "Four Operations"), there has been since leaving the mathematical scene astounding **degradation** in mind that today is law in circles I had known, and (to me it seems, to a large extent at least) in the world

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3.7. Respect and fortitude

mathematics in general ¹³. It is even possible, both in my particular mathematical personality by conditions surrounding my departure, that it acted as a catalyst in evolution that was already in the making ¹⁴ - a development that I did nothing then able to perceive (not more than any other colleagues and friends, with the exception perhaps of Claude Chevalley). The appearance of this degradation I am thinking especially here (which is just **an** appearance among many other ¹⁵) is the **tacit contempt** when it **derision** unequivocally against this (in mathematics, in this case) is not apparent not pure work of the hammer on the anvil or the chisel - the contempt of the most difficult creative processes (and

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often slightest appearance); all that is **inspiring**, **dream**, **vision** (so powerful and fertile p. L20 They are), and even (to the limit) of any idea, so clearly designed and formulated as it: all that is written and **published** in black and white, in the form of statements hardcore, répertoriabiles and listed, ripe for the "data banks" rushed into the inexhaustible memories of our mégaordinateurs.

There has been (to use an expression of CL Siegel ¹⁶) a special "**flattening**", a "**shrink**" mathematical thinking, stripped of an essential dimension of all its "shadow side" of the catchment "female". It is true that an ancestral tradition, then pouring the work of discovery remained in a largely obscured, person (as saying) not **talking** ever - but the living contact with the sources deep dreams that feed the great visions and great designs, had never (to my knowledge) been lost. It seems that now we are already entered a **period of dessè-****mation**, where the source is, not certainly dried up, but she had the access is condemned by the verdict without Call General scorn and retaliation derision.

Here we are approaching the moment he appears, which will be eradicated in each not only the **memory** of all work close to the source, the work "feminine" (ridiculed as "muddy", "soft", "inconsistent" - or at the opposite end as "trivial", "enfantillages", "bombinage". . .), But where it will also be extirpated same work and its fruits: one in which are designed, to develop and originate concepts and new visions. This is also the time where the exercise of our art will be reduced to barren and empty exhibitions "weight and dumbbell "brain, the bidding prowess to" crack "the problems in the Contest (" difficulty proverbial ") - the time of an enlarged" surpermacho "feverish, sterile, taking over more than three creative renewal centuries.

3.7. Respect and fortitude

But again I digress, anticipating that the reflection taught me. I was on a double About clearly present in me since before the beginning of it: the purpose of a "declaration of in- ¹³ This deterioration will also not limited to only "mathematical world". There is also the across scientific life, and beyond even the latter, in the contemporary world globally. A primer finding and thinking in this direction is in the note "The muscle and guts" which opens the reflection on the yin and yang (note ^o 106). ¹⁴ It is the evolution discussed in note cited in the previous footnote b. p. Links between it and the Burial (my person and my work) are emerging and are discussed in the notes "The Funeral of Yin (yin yang bury (4))" "The providential circumstance - or Apotheose" "The disavowal (1) - or recall" "The disavowal (2) - or metamorphosis" (n ^o s 124, 151, 152, 153). Also the latest ratings (in RS IV) "Unnecessary details" (n ^o 171 (v), part (c) "Things that resemble nothing - or drying ") and " The Family Album "(n ^o 173, part c." The one among all - or acquiescence "). ¹⁵ The aspect that is most often the center of attention in Crops and Seeds, especially in the two parts

"Investigation" (RS II or "The Chinese Emperor's robe" and SR IV or "The Four Operations"), and he also, perhaps, me as "stunned" is the degradation of professional ethics, speaking by looting, a débinage and scheming without shamelessly practiced among some of the most prestigious and the most brilliant mathematicians of the time, and this (in a very largely) in full view of everyone. For some other more delicate aspects, and also directly related to that one, I refer to note cited above (n ° 173 part c.) "Things that look like nothing - or drying out."

16 This phrase is quoted and commented in the note just cited in the previous footnote b. p.

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trying ", and (closely related to it, as it just appeared) that to speak about: the nature creative work. Yet there were still about a third less clear at this surely conscious, but meeting a need

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deeper and more essential. He was aroused by these "arrests"

p. L21

sometimes disconcerting, managing my past mathematician by the voice of those who had been my students or my friends (or at least, many of them). In the epidermis, this need was expressed by a desire to "off my chest," said a few "unpleasant truths". But more deeply, surely, there was the need **to know** , finally, with a past that I had chosen previously to evade.

It is this need then, first of all, from what Crops and Seeds. This long reflection was my "answer" daily, this knowledge instinct in me, and constantly renewed without questioning that had me the outside world, the "mathematical world" I left without thought of return. Aside from all first pages of "Fatuité and Renewal", those which form the first two chapters ("Work and discovery "and" The Dream and the Dreamer "), and from the chapter that chains" Birth of fear "(p. 18), with a "testimony" which was not planned in the program, this is what needs to know my past and fully assume that (I think) was the main force used in the writing of Crops and Seeds.

The arrest that came from the world of mathematicians, and that came at me with a force all new in Crops and Seeds (especially during the "investigation" continued in parts II and IV) were taken immediately mask sufficiency, when it was the disdain ("gently dosed"), of derision or contempt, whether vis-à-vis me (sometimes) or (mostly) vis-à-vis those who dared to inspire me (without knowing, of course, of what awaited them) and were "classified" as having partly related to me by some tacit and relentless decree. And again I see here the link "obvious" and deep ", between the **respect** (or disrespect) to the person of another; one for the act of creation and for some of its most delicate and the most essential fruit; and finally, respect for the rules more obvious scientific ethics: those that are rooted in a basic respect for self and others and I can be tempted to call the "**rules of decency** " in the exercise of our art. These are all aspects, surely an elementary and essential "**respect of itself** ." If I try, in one pithy formula, to stock of what was taught Crops and Seeds about a world that was mine, a world which I identified myself for more than twenty years of my life, I would say:

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it is a world that has **lost** the

p. L22

compliance 17 .

This was a thing already strongly felt, if made, from the years prior. She made that will confirm and clarify, always unexpectedly, sometimes staggering, throughout Crops and Seeds. It is clearly apparent from the moment where already a kind of reflection "philosophical" and general suddenly becomes a personal testimony (in "The welcome stranger" (n ° 9, p. 18) opening Chapter cited "Birth of fear").

This perception, however not on the tone of bitter recrimination or bitter, but (by logic Internal writing and the different attitude that it raises) to that of a **question** : what was my own part in this deterioration, this loss of respect I see today? This is the in-main interrogation which passes through and carries the first part of Crop Seeds and, until she finally resolves into a clear determination and unequivocal 18 . Previously, this degradation was me 17 Again, this is a formulation that does not apply only to certain limited areas, where I had ample opportunity to see the something closely, but it seems to summarize some degradation throughout the world today. (Compare Note b. p. The page 19.) In the more limited framework of the balance sheet of an "investigation" continued in Crops and Seeds, this

formulation appears in the note of April 2, "Respect" (n ° 179).

18 In the sections "Sport mathematical" and "No more riding" (n ° s 40, 41).

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3.8. "My family" - or connivance

appeared as "fallen from heaven" suddenly, inexplicably, all the more outrageous, intolerable. the During the discussion, I discovered that she had continued insidiously, without anyone surely do the detected around him or itself, throughout the fifties and sixties, **including my own person** .

The finding of this humble fact obvious surely and without color, mark the first turning point crucial in the testimony, and immediate qualitative change ¹⁹ . This was a first essential I had to learn about my past mathematician and myself. This knowledge of a **share responsibility** incumbent on me in the general degradation (more or less following the acute knowledge moments of reflection) remained as a background note and a reminder, all in Crops and Seeds. It has been so, especially at times when my reflection

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took on the appearance of a survey on p. L23

disgraces and the iniquities of an era. Along with the desire to understand, to curiosity so that animates and carries forward any real work of discovery is this humble knowledge (again forgotten resurfacing the road and still, where least expected. . .) That preserved my testimony ever turn (I think) to the sterile recrimination about the ingratitude of the world, even the "reckoning" with some of those who were my students or friends (or both). This absence of complacency vis-à-vis myself also gave me that inner calm, or the fortitude, that have preserved myself traps vis-à-vis complacency of others, or even just as a false "discretion". All I thought have to say, at one time or another reflection, either on me or some of my colleagues, ex-students or friends, or a medium, or a time, I said, without ever having to hustle my reticence. For them, it was enough every time I examine them closely, so they vanish without trace.

3.8. "My family" - or connivance

It is not my intention in this letter to review all the "highlights" (or all "moments sensitive ") in writing Crops and Seeds, or in any of its stages ²⁰ . Suffice it to say that there was, in this work, four stages or four clearly marked "breaths" - as the breaths a breath, or like the waves in a wave train arose, I do not know how, these vast silent masses still and moving, without limits and without name, an unknown sea without background that is **me** or rather, a much broader and deeper than sea "me" whether and it feeds. These "winds" or the "waves" have materialized in the four parts of crops and Seeds written now. Each wave came without my having called nor in the least expected and at any moment I could not tell where she was going to carry me or when it would end. And when she had end and a new wave already had his suite for a while yet I still believed in me end of a roll (which would also be at the end of ends, the end of Crops and Seeds!), while I was yet already lifted and carried to another blast one and the same broad movement. It is only with hindsight that

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it is clear and that is unequivocally reveals a **structure** in what was experienced as p. L24 and act as a movement.

And surely, this movement did not end with my final point (just temporary!) To crops and Se-
19 The next day, the witness deepens into a meditation on myself and keep that special quality in weeks until the end of the "first breath" Crops and Seeds (with the "weight of the past", n ° 50).

20 You can find a short retrospective-balance of all the first three parts of Crops and Seeds in both note groups "Evening fruit" (n ° s 179-182) and "Discovery of a past" (n ° 183-186).

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mesh, and will end either with the end point to this letter to you, which is one of the "time" of this movement. And it is not born in one day in June 1983 and February 1984, when I sat in front of my typewriter to write (or regain) a certain introduction to a mathematical structure. he was born (or rather, it is reborn...), day or meditation appeared in my life. . .

But again I digress, letting me wear (and go ...) by the images and associations born of now, instead of wisely stand over a "about" the expected. My purpose today was to continue with the story, so brief it may be, the "discovery of the burial" in the month of April, at a time when two weeks ago I thought I had finished Crops and Seeds - how are me tumbled over cascade, in the space of three or four weeks ago, one of the discoveries larger and more amazing than the other - so big and so crazy that even for months yet, I had the greatest evil "to believe the evidence of my healthy schools", to free myself of an insidious **disbelief** before the evidence ²¹ . This secret and tenacious incredulity has finally dissipate in the month of October

(Six months after the discovery of the "Burial in all its splendor"), following the visit of home My friend and former student (occult, it is true) Pierre Deligne 22 . For the first time, I saw myself then faced in Burial either through **texts** , talking to me (admittedly in eloquent terms!) of débinage, looting and killing of a work, and the burial (in the person absent master) of a certain style and a certain approach to mathematics - but in a way that both direct and tangible under familiar features and a familiar voice, the intonations affable and ingenuous. The burial was there before I finally "in the flesh", in these busy and insignificant traits that I recognized well now, but for the first time I looked with new eyes, new attention. Here then deploy in front of

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me that is, in my reflection in previous months, was revealed as the Great Leader

p. L25

my solemn Funerals, like "Priest chasuble" along the main architect and main "beneficiary" of an "operation" unprecedented occult heir of a work delivered to the derision and looting. . .

The meeting room for the debut of the "third wave" in Crops and Seeds, when I had to engage in the long meditation on the yin and yang, in pursuit of an elusive and tenacious Association ideas. At the time, this short episode leaves only a trace of an echo of a few lines, passing. He scores Yet an important moment, the fruits will become apparent until months later.

There was a second such moment of confrontation with "The Burial of flesh and bones." It was there ten days ago, and had just restart again, "last minute", an investigation that there was no end of leave unceasingly This time it was a simple phone call to Jean-Pierre Serre 23 . This conversation "with sticks broken "has confirmed strikingly and even beyond all expectation, that (a few days just before) I had to explain at length 24 , and my body almost reluctantly, about the role played by Serre in my burial and a "secret acquiescence" in him what was happening "right under his nose, "he does not mine to see anything or feel anything.

Again, just like the conversation was all that there is "cool" and friendly, and obviously these friendly provisions Serre to me are also all there was sincere and genuine. it

Nevertheless this time I really saw, or "touch" would I want to write, that "acquiescence"

I had to finally admit to me; "Secret" probably (as I wrote above) but above

21 I try to express this difficulty, for the story "The Emperor of China the dress" in the note of the same name (n ° 77 ©) and there back again in the note "The accomplishment - or the moment of truth" (n ° 163).

22 I make the story of this visit in the note that I just mentioned (in the previous footnote b. P.).

23 This is, in almost exactly a footnote citation "The Gravedigger - or the whole Congregation" (n ° 97, page 417).

24 In part c. ("The one among all - or acquiescence") of the same note (n ° 173).

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3.8. "My family" - or connivance

quick as I could then see no possibility of doubt. Acquiescence quick and unqualified that is buried what is to be buried, and that wherever this is desirable and what that any means, a real paternity (that Serre knows firsthand) and undesirable, to be replaced a dummy paternity and welcome. . . 25 .

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This was a striking confirmation of an intuition appeared p. L26

previous year already, when I wrote 26 :

"Seen in this light 27 , the main officiate Deligne it appear as that which would have shaped fashion like the deep forces that determine his life and deeds, but rather as **the instrument** all designated (in its role of "legitimate heir" 28) a **willingness collective** coherence without faults, focusing on the impossible task to clear my name and My personal style of contemporary mathematics. "

If Deligne occurred to me then as the "instrument" all designated (along with the first and principal "beneficiary") of a "collective will of an absolute coherence", Greenhouse strikes me now as **the incarnation** of that collective will, and as the **guarantor** of its acquiescence without reservation; a acquiescence to all the innumerable scams and shenanigans and even to the extensive "operations" of collective mystification and shameless appropriation, as long as they contribute to this "impossible task" vis-a-vis my modest and deceased, or vis-à-vis some other 29 who dared to réclamer me and make figure, against all odds, the "successor Grothendieck".

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It is a paradoxical and disconcerting aspects, among many others in the Funeral, that celui- p. L27

This is the work primarily, if not exclusively, of those who were my friends or my students, in a world I had never known my enemies. It is for this reason above all, I believe, and crops Seeds concerns you more than another, and that this letter I am writing you is intended as a **interpellation** in turn. Because if you are a mathematician, and if you are one of those who were my students, or who were my

friends, you are probably no stranger to the burial, whether by act or by collusion, and not least by tone vis-à-vis silence me about a thing which takes place before not your door. And if (for Extraordinary) you welcome my humble words and the testimony they bear thee, rather than stay in-closed behind your closed doors and send these unwelcome messengers, you will learn then perhaps it who was buried by all and with your participation (active or tacit acquiescence), not only the work of another, fruit and living testimony of love for mathematics streets; but at a level yet more secret than this funeral (which never says his name...) and deeper, it is a living part and essential to your own being, your original power of knowing, loving and creating, that you liked to bury by your own hands in the person of another.

25 This is, in almost exactly a footnote citation "The Gravedigger - or the whole Congregation" (n ° 97, page 417).

26 This quote is from the same note (see note b. Previous p.), On the same page 417.

27 "In the light" this deliberate, he had just been speaking to eliminate at all costs "unwanted fatherhood" (or, "Intolerable" to use the expression used in the note cited).

28 This role of "heir" Deligne is a role both occult (while not published online Deligne can be suspected he may have learned something through my mouth), and at the same time clearly felt and accepted by all. This is one of Typical aspects of the double game of Deligne and his "style" particular, he knew playing masterfully on this ambiguity, and cash benefits of this heir tacit role while disavowing the late master and taking the direction of operations of wide-scale funeral.

29 I am thinking **Zoghman Mebkhout**, referred for the first time in the Introduction, 6 ("The Burial"), then in Note "My orphans" (n ° 46) and notes (written later, after the discovery of the Burial) "Failure of a education (2) - or create and conceit "and" a sense of injustice and helplessness "(n ° s 44 ©44)". I find the iniquitous retraction operation and ownership of the pioneering work of Mebkhout over the eleven notes forming the Cortère VII Burial, "The Conference - or beam Mebkhout and Perversité" (n ° s 75-80). A survey and a more detailed story this (fourth and last) "operation" as the most extensive part of the survey "The four operations" under the name was necessary " **Apotheosis** " (Notes n ° s 171 (i) 171).

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Of all my students, Deligne had occupied a place well apart, on which I lay at length During the reflection 30 . It was, by far, the "closer", as the only (student or not) to have assimilated intimately and endorsed 31 a broad vision that was born and raised in me a long time before we meet. And among all my friends share with me a passion for mathematics was Greenhouse, which was simultaneously made a bit of an elder, who was the closest (by far also) like that (especially) who for a decade had played in my work a unique role of "détona-tor" for some of my major investments, and for

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Most major key ideas that inspired

p. L28

my mathematical thinking in the fifties and sixties, until my departure. This very special relationship that both had in my person is not unrelated, of course, with the means exceptional one and the other, who assured them also exceptional influence over the mathematical ners of their generation, and those that followed. Apart from these common features, temperaments and ways to Serre and Deligne also seem as dissimilar as possible, the antipodes from each other in many ways.

Anyway, if there were mathematicians who, in one way or another, were "close" to my person and my work (and, what is more known for such), it is Serre and Deligne: one, an elder and a source of inspiration in my work during a crucial period of gestation of a vision; the other, the most gifted student of mine, for which I was my turn (and stayed, Burial or not...) the principal (and secret...) inspiration 32 . If a Burial was initiated in the aftermath of my departure (Now "death" in due form), and materialized in an endless procession of big "operations" and small to serve the same purpose, it could be done with the conjugate and closely bound contest the one and the other, the former elder and former student (see former "disciple"): one taking the discrete direction efficient operations, while sounding the rallying some of my students 33 , bad massacre **Father** (under the grotesque and ridiculous effigy of a bloated and bombinante **super nana**); and the other giving a "fire green "unqualified, unconditional and unlimited in pursuit of the (four) operations (for débinages, carnage, butchering and sharing of inexhaustible remains. . .).

3.9. Counting

As I have already hinted earlier, I had to overcome considerable internal resistance, or rather to be absorbed by a patient work, meticulous, tenacious, to achieve separate me from some familiar images, firmly established, with considerable inertia, which for decades had taken me (as in everyone, and to you too, surely) instead of direct perception and nuanced reality - namely, that of a mathematical world, which I continue to be joined

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a past and a work. One of the most deeply rooted of these images or preconceptions,

p. L29

is that it seems impossible from the outset that a scientist of international reputation, even a man who became a great mathematician can afford (if only in exceptional cases, and even less as an expensive

30 See above, on this, the group of the seventeen notes "My friend Peter" (n ° s 60-71) in SR II.

31 This "broad vision" that Deligne has indeed "intimately assimilated and endorses" had exerted a powerful fascination him, and continues to fascinate despite himself, while a driving force pushes the same time to destroy, to burst its fundamental unity and seize the scattered pieces. So his occult antagonism vis-à-vis a master denied and "deceased" is the expression of a division in his being, which profoundly affected his work after I left - work that remained far below quite prodigious means I had known him.

32 See on this subject the previous note b. p.

33 This is, precisely, the five other students who have chosen as the main theme (as Deligne) of the one cohomology of varieties.

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3.9. Counting

habit. . .) Small or large scams; or if it fails (for old habit again) to soak it hand himself, he can nevertheless welcome with open arms such operations "(defying all sense decency at times) "mounted by another, and where, for one reason or another, it is benefiting. This inertia of mind was such a home, it there less than two months, after a long reflection which had already continued for a whole year, I finally glimpse shyly Serre also that maybe it was something to do in this Burial - something that now appears to me as evidence, even apart from the eloquent conversation I had with him lately.

As with all members of the "middle Bourbaki" that greeted me kindly when I started, and especially in his case, it was for me a kind of "taboo" tacit around him.

He represented the epitome of a certain "elegance" - a style which in no way limited to the form but also includes a rigorous, scrupulous honesty.

Before I discovered the burial on April 19 last year, the idea would not come to me, even dream, one of those who had been my students is capable of dishonesty in the exercise of his profession, whether vis-à-vis myself or anyone else; and that is the most brilliant of them, that also had been closest to me, that such an assumption would have seemed to me the most absurd! Yet from the moment already my departure and throughout the following years and until today, I had ample opportunity to realize how his relationship with me was divided. More than once, too, I saw user (For the pleasure, would have said) power to discourage and humiliate, when the occasion was propitious. I was deeply affected each time (plus, no doubt, that I would not have me admit...). They were there well enough eloquent signs of a profound disruption, which (I had had ample opportunity to see) was by no means limited to his person, even in the more limited circle of those who had been my students. Such a disruption, the loss of respect for the person of another, no less blatant and less deep, as manifested by what is called a "professional dishonesty." Nevertheless the

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discovery of such dishonesty came to me as a complete surprise and a shock.

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In the weeks that followed this stunning revelation, followed by a "cascade" of other the same water, I also made gradually account that a scheming among some of my students ³⁴, had already begun in the years prior to my departure. This was particularly evident, precisely among the brightest of them - that, after my departure, which set the tone and (as I wrote sometimes) "took the discreet and efficient management of operations." Looking back nearly twenty years, scheming I will now appear as obvious, he "was palpable." If I then chose to overlook what happening, all in pursuit of the "white whale" in a world "where everything is order and beauty" (as he liked to imagine myself), I now find that I did not know then assume responsibility my responsibility, vis-à-vis students learning at my touch a job I love; a profession that is something else more than just knowledge, or the development of a "flair". By vis-à-vis complacency of bright students, he enjoyed it (automatically decree) to deal in "separate beings" and above suspicion, I contributed my part then ³⁵ to the outbreak of corruption (unprecedented, to me it seems) I see spread today in the world and among the beings who were dear to me.

Certainly, for their immense inertia, it took an intense and sustained work to separate myself from what was commonly called the "illusions" (not without some regret intonation...), and I would call rather

34 See previous footnote b. p.

35 This "contribution" - there appears notably in the note "Being apart" (n ° 67) and two notes in "The Ascension" and "L" ambiguity "(n ° s 63) and again (in a somewhat different light) at the end of the note "The eviction (n ° 169). Another type of "contribution" appears in "Fatuité and Renewal", with attitudes of complacency vis-à-vis young

mathematicians less brilliantly endowed. This awareness of responsibility in a general degradation culminates in "Sport mathematical" (n ° 40).

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made ideas; on myself, on a medium to which I had identified myself once, on people I loved and maybe I still love - me "separate" these ideas, or rather, **let me come off** . This was a job, yes, but never a struggle - a job that brought me, among many other things price, sad moments sometimes, but never a moment of regret or bitterness. Bitterness One way to avoid

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knowledge, to evade the message of an experience; to maintain a certain

p. L31

tenacious illusions about oneself at the expense of another "illusion" (negative, sort of) on the world and on others.

This is without bitterness or regret that I see coming off of me one by one, as much weight bulky or overwhelming, these ready-made ideas that had been me "dear", by old habit and because they were by the "forever". They had become, for sure, like second nature. But This "second nature" is not "me." In separate myself piece by piece is not a tear or even frustration, one that would have stripped things that for him the price. Counting" I speak just as the reward and the fruit of **labor** . His sign is immediate relief and beneficent, a **liberation** welcome.

3.10. Four waves in motion

As fair, this letter does not look anything like what I had planned for me putting. I was thinking mainly there to make a small "topo" on Burial: this happened in broad, tu will believe or not (I myself have struggled to believe...), but that it though, no doubt, even that that you like it or not, black on white publications such as book or periodical, such a date such a page, you have only watch - besides everything is unscrewed from the menu in Crops and Seeds; See "Four Operations" such notes - take it or leave it! And if you rather abstain to read me, of others will do well in your place. . .

Finally there was nothing of it - yet this letter is already at Cape thirty pages, while

I was planning five or six in all and for all. Without even I have it on purpose, these are the essential things

I was led to say, the pages, while this "bag" I had been so looking forward to empty (well there

Obviously for once, the first pages!) it is still not unpacked! It does not even tickle me

in the fingers, envy dissipated along the way. I understood that this was not the place. . .

Actually, Part IV of Crops and Seeds (and longest of all) with name "The Burial

(3) "or" The Four Operations "comes from a" note "originally scheduled as" a little history "precisely to summarize in outline what was revealed to me the investigation to surprise (and breezed) of the year last, continued in Part II ("The Burial (1)" or "The dress of the Emperor of China"). I was thinking there would be for a "note" of five or ten pages, not more. Eventually leading to another, it did start the investigation, there were nearly four hundred pages - nearly double

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the part I was supposed

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summarize or take stock! It is therefore still missing a little rundown in question, whereas in les six hundred pages of Crops and Seeds are devoted to the investigation of the Burial. It a little silly, That is true. But there will be time to add it to a third party in the Introduction (which is more than ten or twenty pages close), before entrusting my notes to a printer.

The five parts of Crops and Seeds (the last is not over yet, and never will be probably not before a few months) are alternating (three) vagues- "meditation" and (two) vagues- "investigation". There is like a reflection in miniature of my life for the last nine years, which consisted alternating, too, of "waves" that arose two passions that now dominate my life, passion meditation and mathematical passion. And truth be told, the two parties (or "waves") of crops and

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3.10. Four waves in motion

Seeds that I just described to name the cookie cutter "investigation" are those who are just arisen directly from my roots in my past mathematician, driven by mathematical passion

Me and the egotistic attachments that are rooted in it.

The first wave, "Fatuité and Renewal," is a first encounter with my past mathematically cian, leading to a meditation on my present, I just find the roots in the past.

Without this having been the least premeditated, of course, this part establishes the "basic tone" for the entire suite Crops and Seeds, it is like an inner preparation, providential and essential for as-summarize the discovery of the "Burial in all its splendor" which closely follows, in the second wave, "The Burial (1) - or the dress of the Emperor of China." More than an "investigation", indeed, is indeed the history of this discovery daily, its impact on my being, my efforts to deal to thereby tumbled over me without warning, to get to the place incredible in terms of my experience, what eventually became familiar to me, make it intelligible somehow. This movement leads to a first interim result in the note "The Gravedigger - or the whole Congregation" (n ° 97) first attempt to discern an explanation and meaning in something that, for years and so now more acute than ever, taking on the appearance of a formidable challenge to common sense! This same second movement also leads to an "illness episode" ³⁶,

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forcing me to p. L33

absolute rest and ending more than three months all intellectual activity. This was at a time I thought I was again about to be completed Crops and Seeds (in the last task "Stewardship" closely. . .). Resuming normal activity towards the end of September last year, and preparing me to finally put the finishing touches to my notes remained in distress, I always believed in having two or three terminal add notes, including one concerning the "health-incident" in which I had just passed. In fact, from week to week and month to month, it still a thousand pages that came - more than double what was already written - and this time, it is clear that I still have not finished ³⁷! In fact, this long interruption, during which I almost lost contact with a substance that was all there a hot (and hot!) at the time of exit, I practically forced to return to this substance with new eyes, if I would limit myself to "close" stupidly the last end of a "program" with whom I had lost touch a living.

Thus was born the third wave in the vast movement known Crops and Seeds - long "Wave-meditation" on the theme of yin and yang, the slopes "shadow" and "light" in the dynamics of things and in human existence. Following the desire for a deeper understanding of the underlying forces at work in the Funeral, this meditation yet acquired early autonomy and unity own, and doing right away to what is most universal, such as to what is most intimately staff. It was during this meditation I discovered this thing (obvious indeed little we the question) in my spontaneous approach to the discovery of things, be it in mathematics or elsewhere, the "basic tone" is "yin", "female"; and also, and above that, contrary to what is going on Most often, I remained faithful to this original nature in me ³⁸, without the influence or to correct ³⁶ This episode is the subject of two notes "The incident - or the body and mind and" The trap - or facilitated and exhaustion "(n ° s 98, 99) opening the "Procession XI" named "The deceased (still not dead)."

³⁷ "Still not finished" - if only because it has yet to come part V, which is not complete at the time of writing these lines.

³⁸ This "faithful to my original nature" was by no means full elsewhere. For a long time it was limited to my work mathematics, while elsewhere, particularly in my relationships with others, I followed the general trend by developing and giving primacy to traits in me felt like "manly", and repressing the "feminine" traits. This is discussed so some length in the group notes "Story of a Life: a cycle in three movements" (n ° 107-110), which opens virtually the Key of Yin and Yang.

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conform to the dominant values in honor in the surrounding areas. This discovery appears to me 0

first as a mere curiosity. It is only gradually that nevertheless revealed as a key p. L34

essential for an understanding of the Burial. Moreover - and this is something that seems to me more reaching yet - I see now very clearly and without residue doubt this: if, with of no exceptional intellectual gifts, I have nevertheless constantly give my full measure my mathematical work, and produce a work and bring forth a broad vision, strong and fruitful, it is nothing but this loyalty I owe, in the absence of any concern to abide by the standards, whereby I surrender with total confidence in the original knowledge instinct, without prune or not to amputate in nothing that is its strength and its delicacy and undivided Nature. This is however not the creativity and its sources located in the center of attention in this meditation "The Burial (2) - or the Key of Yin and Yang", but rather "conflict", the lock status creativity, or dispersion of the creative energy by the clash in the psyche of antagonistic forces (mostly hidden). Aspects of **violence**, violence (apparently) "Free", "for fun" had puzzled me more than once in the Burial, and have resurrected a host of life situations Similar. The experience of this violence was in my life as the "hard core, irreducible to experi- Experience the conflict. "Never before have I myself faced with the tremendous mystery of existence and

the universality of violence in human life in general and mine in particular. It is that mystery that is at the center of attention throughout the second half (the slope "yin" or "decline") of the meditation on the yin and yang. It is during this part of meditation that gradually emerges a deeper vision of the meaning of the burial, and the forces that express it. This is also the part of Crops and Seeds has been most fruitful, it seems, at the knowledge of myself in putting me in touch with the issues and critical situations and making me feel just that character "nerve", which until last year still remained evaded.

Once at the end of this interminable "digression" on the yin and yang, I always stayed at little closely with my "two or three notes" to write again (plus one or two others, at most, one already had his name all found "The four operations." . . .), To be completed Crops and Seeds. We know the rest: these "few last notes" have come to the longest part of Crops and Seeds, nearly

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five hundred pages. This then is the "fourth wave" of the movement. It is also the p. L35

third and final part of the Burial, and I gave him the name "The Four Operations", which is notes also that of the group ("The four operations (on a relief)") which is the heart of this QUA trième breath of reflection. This, in Crops and Seeds, the "investigation" in the strictest sense of the term - with this grain of salt, however, that this investigation is not limited to pure "technical" appearance to appearance "Detective" in stock, but that thinking is moved foremost, as elsewhere in crops and Sowing, the desire to know and understand. The tone is more "muscular" certainly in the first part of the Burial, where I was still a little to rub my eyes and asked me if I was dreaming or what! This prevents the facts updated the pages often come to the point appointed to illustrate on the spot many things that were only touched upon in passing here and there, to be embodied in specific and vivid examples. It is in this part also the digressions mathematic play an important part, stimulated by a renewed contact (the survey necessities) with a substance that for fifteen years I had lost sight of. There is also, at the other end of the spectrum, stories from life misadventures My friend Zoghman Mebkhout (to which this part is dedicated), to hands of a "mafia" top flight and unscrupulous, he had no dreamed of embarking on the subject (certainly exciting, and apparently harmless) of the cohomology of varieties of all kinds. For a thread

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3.11. And movement structure

succinct driver through the intricate maze of notes, sub-notes, sub-notes. . . all that part "investigation", I refer you to the table of contents (notes 167 @ 176 7), and the first notes of the pack, "The detective - or life in pink" (No. ° . 167 @I, however, that this note, dated April 22, was then a little "overwhelmed" because, twists of twists, this survey I

believed then (almost) full-term, continued to zinc stranded for two more months.

The fourth blast was extended over four months in a row since mid-February until about the end of June. It is in this part of the discussion above, a "work room" meticulous and stubborn, that settled gradually over days and pages, a concrete, tangible contact with the reality of the Burial; I happen to me "familiar" with it, in fact, ever so slightly, notwithstanding the visceral reactions of refusal he had above-cited (and continues to arouse) in me, preventing a true plug-knowledge.

This long reflection takes his departure with a retrospective on the visit of Deligne (which was discussed already this

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letter), and it ends with reflection "last minute" about my relationship to Serre and on p. L36 the role of Serre in the Burial 39 . It was to have tacitly put Serre "harmless" in favor of this "Taboo" of which I have spoken, now seems the most serious flaw perhaps was left in my understanding of Burial, until last month yet - and it is this reflection "last minute" which suddenly seems to me the most important thing that I have made this "fourth breath" of Crops and Seeds for a less tenuous understanding, more substantial of the Burial and forces it express.

3.11. And movement structure

I think I finished a tour of the most important things I wanted to tell you about

Crops and Seeds, to make you already know "what it is" surely I have said more than enough to enable you to judge whether **you**, you consider that the letter of (over) a thousand pages that should follow "about you" or not - and as a result, if you go or not to continue your reading. In case it would be "yes", it seems useful even join some explanations (of a practical nature, in particular) about the **form** of crops and Sowing.

This form is a reflection and expression of a **mind**, I tried to "pass" in the pages foregoing. Compared to my previous publications, if a new quality which appears in Crops and Seeds, and also in "In the Fields of Pursuit" from which it came, this is probably the **spontaneity**.

Certainly, there are conductors son, and great questions, which give coherence and unity to all reflection. It nevertheless continues daily without "program" or "plan" prearranged, without the matter ever set me in advance "what was to be demonstrated". My purpose is not to demonstrate,

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but to **discover**, to penetrate further in an unknown substance to condense p. L37

which is still only approached suspicion, glimpsed. I can say without any exaggeration really, that

In this work, there is not a day or a night of reflection, which is held in the field

the "expected" in terms of ideas, images, associations that were present when I sat

39 In parts c, d, e, the note "Family Album" (n ° 173), the last is dated June 18 (there are exactly ten days).

There is a single note or notes portion of which the date is later (ie, "Five Theses for a massacre - or filial piety", n °

176 7, dated the following day June 19). You will notice that in this fourth part of Crops and Seeds or "party investigation"

Contrary to what happens to others, the notes often follow in a logical rather than chronological. So,

the last two notes of the Burial (forming the "De Profundis" final) are dated April 7, two and a half months before the

Note that I just mentioned. I note that even when outside the party "investigation" itself to the Burial (3)

(notes n ° s 167@176 7), forming the "fifth step" of the funeral ceremony (including the Key of Yin and Yang is the second)

the notes are followed in the order they were written, with rare exceptions.

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before the white sheet, to stubbornly pursue a "thread" tenacious, or to take another one

just appeared. Each time, which appears in thinking other than what I would have been able to predict,

had I ventured to try to describe in advance somehow what I thought I saw before me. The

Most often the reflection engages in entirely unexpected ways initially, to lead to

new landscapes, equally unexpected. But even though it would stick to a route more or less

provided, that reveals to me the trip as the hours differs as much from the image I was putting myself

on the way, a real landscape, with its cool shade and warm light games, delicate perspective

changing at the whim of not due hiker, and the innumerable sounds and these unnamed perfume worn by a

breeze danced herbs and sing the forests. . . - that such a living landscape, elusive, differs from

postcard, beautiful and successful, if "just" as it is.

It is the continued reflection of trafficking, during a day or a night, which is the undivided unity,

living and individual cell in some way; overall reflection (Crops and Seeds in

case). It is to each of these units (or the "notes" 40, forming

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melody. . .) That the body of a

p. L38

living organism is at each of its individual cells, of infinite variety, each fulfilling a

place and a function that belongs to her. Sometimes, however, even in a reflection of a continued

trafficking is perceived afterwards important hyphenation, who are distinguished several such units or messages,

therefore each receives its own name and thereby acquires an identity and own autonomy. In

other times by cons, thinking that was found cut short for one reason or another (chance

mostly), spontaneously prolongs the next day or two days later; or a reflection of continued

two or more consecutive days nevertheless appears, in retrospect, as if she had continued

in one shot; it seems that only the sleep need has forced us, against our will, to include

some hyphenation (somehow "physiological"), only marked by a lapidary date indication

40 Originally, writing Fatuité and Renewal, the name "note" was synonymous to me "annotation", playing the role

of a page of basic note. For typographical reasons of convenience, I preferred to reject these annotations at the end of the text

(Notes 1 to 44, pages 141 and 171). One reason for this was that some of these "notes" or "notes" extend

on one or more pages, and become longer as the text they are supposed to comment. As for "units"

undivided "first draft" of reflection, for lack of a better name I called then "sections" (less forbidding than

"Paragraphs"!).

This, and the structure of the text, changing with the next section, which initially was called "The Burial", and

became "The Burial (1)" (or "The dress of the Emperor of China"). This thinking chained to the double-note "My

Orphans "and" Denial of inheritance - or the price of a contradiction" (Notes n ° s 46, 47, pages 177, 192), coming annotation

the ultimate "in" Crops and Seeds (or rather, of what would be his Part I or Fatuité and Renewal), "The

weight of a past" (n ° 50, p. 131). Subsequently, are added to it other annotations in the same section (notes n ° s 44 @nd

50) and others note annotations coming in to "My orphans," who in turn gave to birth new notes

annotantes; besides, this time genuine footnotes page, when provided annotations were (and remain, a

both black on white set) of modest dimensions. Thus, theoretically, all that part of Crops and Seeds (which was

then supposed to constitute the second and terminal part) appeared as a set of "notes" to the "section" "Weight of

past. "For the inertia acquired subdivision in" notes "(instead of" sections ") was still held in three parts

following, where I used together as a means of annotation for a "first draft" of reflection, as well footnote

page (when its size permits) that the subsequent note to which reference is made in the text.

Typographically, the "note" is distinguished from "section" (used in RS I as the basic unit of the "first throw" of the reflection) by a sign such as (1), (2), etc. (including the note number in brackets and "floating" in a widespread use for references to annotations), placed either at the beginning of the note, either as a reference to the place appropriate text which refers to it. The sections are designated by Arabic numerals 1 to 50 (excluding off-putting Exponents and, as I was brought in to use for notes, by the imperatives of a practical nature). That said, we can say that there is no essential difference between the function of the "sections" in the first part of Crops and Seeds and the "notes" in subsequent parts. The comments I make about this function in this part my letter ("Spontaneity and structure") applies to both "sections" of SR I, even though I use the common name "Notes."

For further details and conventions, especially regarding reading the contents of the Burial (1), I refer to the Introduction, 7 (Scheduling The Funeral), in particular pages xiv - xv.

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3.11. And movement structure

(Or even several) between such consecutive paragraphs of the "note" planned, which then distinguished as Such a unique name.

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Thus, each note of Crops and Seeds has its own individuality, a face and a function p. L39 distinguish it from any other. For each, I tried to express his own particularity by its **name**, supposed return or recall the essential, or at least something essential, what she "has to say." Each, I truly admit, before anything else, by name, and it is by this name as I call it, Each time thereafter I need assistance.

Often the name was presented to me spontaneously, even before I ever thought. It is his appearance unexpected that tells me, then, that this note then that I am still writing is about to be completed - she said what she had to say, the time to complete the paragraph I'm writing ... Often, the name appears just as spontaneously, by reading the notes from the day before or the day before, before continuing my thinking. Sometimes it changes somewhat in the days or weeks the onset of the new arrival note where it is enriched with a second name which I had not thought first. Many notes have a double name, expressing two different lights, sometimes Further, its message. The first double-names that will be presented to me from the beginning of "Fatuité and Renewal" is "Meeting with Claude Chevalley - or freedom and good feelings" (n ° 11).

Only twice have I already had a name in mind before starting a note - and both times, moreover, he was jostled by the events!

It was, in retrospect only, Reverse weeks or even months, that appears an **overall movement** and a **structure** in all notes following overnight. I tried to grab one and the other by various groups and sub-groups of notes, each with his own name, which gives it its existence clean and its function or message; much like the organs and member of the same body (for resume image sometimes), and such portions of its members. Thus, in the "All" Crops and Seeds ago has five "parts" of which I have already mentioned, each has a good structure to it: Fatuité and Renewal is grouped into eight "chapters" I to VIII 41, and all three portions

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the Burial (which they p. L40

also gradually emerged over the months. . .) Is formed of a long and statutory Procession twelve "Processions" I to XII. The last of these, or rather the " **Funeral Ceremony** " (that is his name) to what had routed (without too suspecting anything, surely...) the previous eleven processions, is truly gigantic dimensions, measurement of the Work she dedicates solemn Funerals: it encompasses substantially all of RS III (L Burial (2)) and all RS IV (L Burial (3)), with its nearly eight hundred pages and in the hundred and fifty notes (while initially, the famous ceremony was planned to comprise only two!). Driving with skill (and with his well-known modesty...) By the officiating in person, the ceremony continues in new "time" or separated liturgical acts, opened by **the Funeral Eulogy** (one would have suspected) and ending (as it should) in the **De Profundis** final. Two others among these "time", named one of " **The Key of Yin and Yang** ", the other " **The Four Operations** ", are each (by far) the largest part of the portion (III or IV) Crops Seeds and wherein it is inserted, and also gives its name to it.

Throughout Crops and Seeds, I took care (as the apple of my eye!) Of the table materials, revise the constantly to reflect the ever renewed influx of unexpected Notes 42 and 41 In Fatuité and Renewal, I refer occasionally to these chapters as "parts" Crops and Seeds, which must be confused, of course, with the five parties that have already been made, and only appeared subsequently.

42 These unexpected notes, there are particular ones "from a footnote page that has taken prohibitive dimensions tive. "Usually, I placed immediately after the note to which it relates, giving him the same number

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make him reflect as finely as I could to set the movement of reflection and structure delicate that comes to light. It is in Parts III and especially IV (which he just mentioned), "The Key" and "The Four Operations" that this structure is found to be the most complex and the most nested.

To keep the text the character of spontaneity and the unexpected aspects of reflection as continued and it was really lived, I did not want to precede the notes by name, while it each time only appeared after the fact only. It is why I

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advise you in the end

p. L41

read every note, to defer you to the table of contents to learn how the note is called; and also, on occasion, to appreciate at a glance how it fits in thinking already pursued, even in the yet to come. Otherwise you risk losing you without hope a set in indigestible and motley appearance of notes to the sometimes bizarre numbering, not say grunt ⁴³; like a traveler lost in a foreign city (oddly thrust there at the option of caprice generations and centuries ...) without a guide or just a plan to help guide them.

In the manuscript for printing, I plan to include over the names of "chapters" and other text groups of notes and sections, with the sole exclusion of ratings (or sections) themselves. But even then the occasional use of the contents seems to me indispensable, not to get lost in a jumble of hundreds of notes, according to the single file-tail over a thousand pages. . .

3.12. Spontaneity and rigor

Spontaneity and discipline are the two sides "shadow" and "light" of the same undivided quality. It is from their nuptials, only, that is born this particular quality of a text, or be, we can try to mention a phrase like "quality of truth." If in my previous publications, spontaneity summer (if not absent, at least) to a minimum, I do not think by its late flowering in me, rigor became less either. Rather, the presence in itself of his girlfriend gives the yin rigor one dimension, a new fertility.

This rigor is exercised vis-à-vis itself, ensuring that the "tri" delicate that it must operate in the multitude of what happens in the field of consciousness, to settle there incessantly significant or most fortuitous or accessory, not thickens and congeals into censorship and automorphisms complacent. Only curiosity, thirst for knowledge in us awakens and stimulates such vigilance without heaviness, such vivacity, against the immense inertia, omnipresent, the "slopes (say) natural" carved by the preconceived ideas, expressions of our fears and our conditioning.

And this same rigor, the same careful attention also towards spontaneity as to what which takes aspects, to share it, again, these "slopes" everything is natural, of course, and distinguish

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what actually flows from the deep layers of the being, the original impulse of

p. L42

knowledge and action, bringing us to meet the world.

At writing, the rigor is characterized by a constant concern to identify as fine way, too faithful as possible, using the language, thoughts, feelings, perceptions, images, intuitions. . . it is to express, without simply a vague term or approximate where the thing to express is contoured clear-cut, or a term of a dummy accuracy (and thereby also deforming) to express

assigned an exponent or even as needed - avoiding the prohibitive task of having to renumber the same time all all subsequent notes already written! These notes, from a footnote page to another, are preceded in the table materials for the sign! (At least in the Burial (1)).

⁴³ For the purpose of such appearance numbering perhaps preposterous at times, I am referring to the previous note footnote to this endless letter.

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3.12. Spontaneity and rigor

thing that remains shrouded mists of what is still only approached. When we try to pick as in the moment, and only then, the unknown thing reveals its true nature, and until the full light of day perhaps, if done for the day and our desire makes him strip off its shade sails and mists. Our role is not to attempt to describe and fix what we do not and which escapes us, but to take notice humbly, passionately, the unknown and the mystery surround us on all sides.

This means that the role of writing is not to record the results of a search, but the process same results - the work of love and the works of our love for our Mother the World, the Unknown, who tirelessly calls us in it to even know of its inexhaustible Corps throughout

it where we are the mysterious ways of desire.

To make this process, flashbacks, that qualify, clarify, deepen and sometimes correct the "first throw" of writing, or a second or third part of the same process of the discovery. They are an essential part of the text and give it meaning. This is why the "notes" (Or "notes") placed at the end of Fatuité and renewal, and to which reference is made here and there in the fifty "sections" that constitute the "first draft" of the text, are an inseparable and essential part of it this. I urge you to see you there to progressively and at least the end of the reading of each section displaying one or more references to such "notes." It is the same for page footnotes in other parts of crops and Seeds, or references, in such a "note" (here constitute the "main text"), subsequent to such notes, which is therefore based on "return" on it, or annotation. This, with my Board not to get separated during reading the table of contents, the main recommendations reading I see to make.

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One last question, practice, which will close (somewhat prosaically) this letter it is time to finish. p. L43
There was some "panic" at times, to prepare the various fascicles of Crops and Seeds for pulling the duplicated service to college, in time for the draw is done (if possible) before summer holidays. In a hurry, there is a sheet of notes footer last minute, to add Issue 2 (The Burial (1) - or the dress of the Emperor of China), which has "skipped". This was especially rectification of certain clerical errors, appeared recently only being written in Four Operations. There is one of these low-notes is more consistent than others, and I would like here. This is a note to the note "The victim - or both silences" (n ° 78 @page 304). This note, which I tried, among other things, determine my impressions (all subjective, of course) to about how my friend Zoghman Mebkhout "internalized" at that time the iniquitous spoliation which it was fresh, was felt by him as unfair to him, whereas I seemed almost to put "in the same boat" with spoilers. What is certain is that in this note, which does not claim not give anything but impressions related to a "moment" particular I has only one sound bell, leaving the unspoken (and as a matter of course, no doubt) some other sounds all as real (and less debatable perhaps). Still, that reflection on this delicate subject deepens significantly, one year apart, in the note "Roots and Solitude" (n ° 171). It has not provoked Reserves from Zoghman. Other thoughts on this subject can also be found in the two notes "Three milestones - or innocence," and "The dead pages" (n ° s 171 (x) and (xii)). These three notes are part of "The Apotheosis", which is part of the Four Operations devoted to the operation of ownership and misuse of the work of Zoghman Mebkhout.

It only remains for me to wish you good reading - and the pleasure of reading you in my turn!

Alexandre Grothendieck

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3. U DO LETTER

Epilogue in Postscript - or context and prerequisites of a debate

February 1986

3.13. The bottles spectrograph

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That@seven months concoctions that this letter was written, and nearly four months it is sent with the p. A44

"pad" that goes with it. And with a dedication of my hand in each 44 . As a "bottle in the sea", or rather, as a slew of such stray bottles, my message went to land and move up in the most remote corners of this mathematical microcosm that was familiar. And direct echoes and indirect returning in me over the days, weeks and months, I am unexpectedly as before a vast radiography mathematical community, which would be taken by a sprawling spectrograph, which my innocent "bottles" are many travelers antennas. So (noblesse oblige!), I who Yet no lack of something to do, that placed me in front of the new task to decipher the radio and accountability, as best I can, what I have read. It will be for the sixth (and last is promise!) part of Crops and Seeds. So it will crown if God willing, "the great sociological work of my old age. "For now, the first few comments.

To accommodate my very modest scale fleet, which seems to dominate by far, is the tone mid-mocking, half-surly, to the tune of "Here Grothendieck becomes paranoid in his old age," or " There is one who takes himself very seriously " - and voila I have had yet one letter this! style then 45 , plus two others in that of a cozy derision and delighted to itself 46 . Most of my recipients mathematicians, including among those who were my students responded with silence 47 - a silence tells me along.

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This prevents that I already had a voluminous correspondence. The vast majority of letters are in p. L45

shades of polished embarrassment which often friendly would be, for the sake of propriety. two or Three times I felt this embarrassment behind and as he sifted through the heat of a still alive feeling. Most often, when the embarrassment is not expressed by the protests of good feelings (on its own account, or that of others), it is through compliments - I© never have as received in my life! Sure the air of the "great mathematician", "beautiful pages" (creativity "and all that"...) "indisputable writer" and many more. For good measure, I even got a heartfelt compliment (and not ironically) the richness of my inner life. Needless to say, all those letters, my correspondent has custody to get to the heart of any matter, let alone to get involved personally; the tone is rather of that which would have been "requested to provide an opinion" (in the words of one of these letters) on a matter a little shady, and what is more, hypothetical or imaginary, and certainly not least, a case **that does not concern him personally** . When it© mine yet to touch it, to any of these questions, it© fingertip and keep it as far away from him as he can - whether in favor of good advice provided to me, or conservative contingent, or the commonplaces of use when it is not clear

44 There are a few exceptions, including especially the colleagues I do not know personally, and who received only fascicles 0 and 4 of the provisional draw, bonus for their active participation in my burial.

45 This letter comes from one of those who were my students, and in addition, one of my coenterrés.

46 On the part of two of my former colleagues in Bourbaki, and one of which is one of the elders who welcomed me with a warm well-veillance, when I started.

47 For a hundred and thirty-one shipments mathematicians, there was far fifty-three among the recipients who have given signs of life, were it only to acknowledge. Among them, there are six of my former students - I have not had any sign of life the other eight.

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3.14. Three feet in a dish

what to say, or otherwise. Some still have suggested that there may be things not very normal that happened - while taking care to leave in the largest wave of what and who it is. . .

I also had frankly warm echoes from fifteen or sixteen of my old and new friends. Some expressed an emotion, without inclination to want to hide or silence. These echoes, and other equally warm from me outside the mathematical community, have been my reward for a long and lonely job, made not only for myself, but for everyone. And among the few hundred and thirty colleagues who received my letter, there are three who responded in the full sense, by getting involved themselves, instead of merely a distant comment on events of the century. I received another such still echo a corresponding non-mathematician. They were real **replies** to my message. And that was also the best of my rewards.

3.14. Three feet in a dish

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Many of my colleagues and friends mathematicians hoped that Crops and Seeds opens p. L46 a broad **debate** in the mathematical community, the state of morals in that environment, ethics of mathematicien, and the meaning and purpose of his work. For now, the least we can say is that it does take not the way. As of now (and for the game rigor of words) the debate on everything Burial seem to be replaced automatically by the burial of a debate!

That does not stop, like it or not and despite the silence and apathy of the many, that a debate is well and truly open. It is unlikely to ever take the size of a real public debate, or even (God forbid!) the pump and the stiffness of the debate "official". Many are in any case those who already took the lead quickly, to close in their hearts even before having read, highlights the eternal and unchanging consensus that "all is for the best in the Brave New World "(mathematics, in this case). Maybe yet a questioning eventually come from the **outside** , gradually, by "witnesses" who are not part of the same medium, are not Prisoners of its group consensus, and therefore do not feel (even in their hearts) in question personally.

In almost all the echoes received, I see the same confusion about the two preliminary questions: **whereupon** door "debate" raised (at least tacitly) by Crops and Seeds; and which is adapted to take knowledge and pronounce it, or again, to form an opinion with full knowledge of the facts. To , I would like here well mark **three "benchmarks"** . This will not stop, of course, those who hold confusion to continue to maintain it. At least, for those who want to know what it is, Perhaps this can he help them not to be distracted by the sound effects in all directions (including same the best intentioned. . .).

a) Such sincere friends assure me that "everything will eventually work out" (or "all", I guess, means "things" that would inadvertently damaged ...) I just had to make my comeback, "intrude by new work ", give lectures etc. - and the other would do the rest generously be told." We was a bit unfair when even the sacred Grothendieck "and rectify discreetly and more or less conviction 48 (*);

even the pat his shoulder in a paternal air, giving it the "great p. L47 mathematician ", just to calm a nobody altogether respectable, which unfortunately pretends to get upset and make unwanted waves.

48 (*) I have had occasion to note already several such discrete signs, showing that we have taken note that the lion woke up. . .

3. U DO LETTER

It is not, as suggested by these friends, "concessions" or to let go. I have to Personally, no need compliments or even sincere admirers, and not to "Aliés" for "my" cause or for any reason whatsoever. It is not me that this, which leads me to wonder, or my work, that speaks for itself, were it to the deaf. If this debate also concerns, among others, myself and my work is just as **revealing** else, through the reality of a burial (of more telling effect).

If there is "someone" seems to me to inspire a sense of alarm, anxiety and urgency, is not my person, nor any of my "coenterrés". But there is a collective being, both elusive and very tangible, often talked about and that is careful not to ever consider, and which not " **the mathematical community** . "

In recent weeks, I finally see her as a person of flesh and bone, and whose the body would hit a deep gangrene. The best food, the most selected dishes, she turn into poison, which is spread and more entrenched evil. Yet there is an irresistible bulimia to binge again and still more as a way likely to deceive, about a bad she would not want to read at any price. Whatever one may say it is a waste -The the simplest same words have lost their meaning. They cease to be holders of a message, and no longer serve that trigger the clicks of fear and denial. . .

b) Most of my colleagues or old friends even willing, when they venture an opinion, surround themselves conservative contingent, like "if it were true it would be unacceptable in effect..." - History going back to bed happy in their beds. I had grown yet clear. . .

Looking back seven months, I can now state that **for almost all of the facts** reported and commented in Crops and Seeds, **their reality is not the subject of any controversy** . I will return away on a few exceptions, which will be also marked as such, each in its place, for all other facts, after writing the original version

Crops and Seeds, confrontation

p. L48

careful with some of the key concerned (ie pierre Deligne Jean-Pierre Serre and Luc Illusie) has eliminated the errors of detail, and reach an agreement unambiguous about material facts themselves 49 (*).

Thus, the debate bears no relationship to the facts, which is not at issue, but the question **if the practices and attitudes described by these facts should be considered and accepted as "normal" or not** .

This is practical in my testimony I call scandalous (perhaps wrongly...); as abuse of trust or power and as blatant dishonesty, reaching more than once dimension of the unjust and blatant. The pretty unimaginable that I had to learn again, after becoming aware of these facts (unthinkable there another fifteen years) is that a large majority among my fellow mathematicians, and even among those who were my students or friends, consider today these practices as normal and perfectly honorable.

c) There is a second way for many of my colleagues and old friends to maintain confusion.

It is on the air: "Sorry, but you are not expert in the field - do not ask us to take knowledge of facts, which we pass (providentially...) over the head. . . "

I say, on the contrary, to learn about key facts, there is no need to be "specialist" (sorry my turn!), or even know his multiplication table or the Pythagorean theorem.

49 (*) I am pleased to express my gratitude to all three, for the goodwill they have shown on this occasion, and gives them their good deed for total faith, for everything concerning issues of material facts.

3.14. Three feet in a dish

Not even having read "The Cid" or the Fables de la Fontaine. A ten year old normally developed is just as capable as the most renowned specialists (even better than he...) 50 (**).

Let me illustrate this point by just an example, the "first come" from the Burial 51 (***) .

There is no need to know the ins

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and outs of the multifaceted mathematical concept and very delicate p. L49

of "reason" or to only have his certificate of studies to learn about the following facts, and to make judgments about them.

1 °) Between 1963 and 1969 I introduced the concept of "reason"; and I developed around this concept a "Philosophy" and "theory", remained partially conjectural. Rightly or wrongly (no matter here), I consider the theory of motives like what I brought to deeper mathematical my time.

The extent and depth of "motivic yoga" is also now more challenged person

(After ten years of almost complete silence about it, soon after my departure from the mathematical scene).

2 °) In the first and only book (published in 1981), mainly devoted to the theory of motives (and where the name, introduced by me, in the title of the book), the only passage which could be suspected the reader that my modest person is linked in any way to any theory that might look like

that developed extensively in this book is on page 261. This passage (two lines

half) is to explain to the reader that the theory developed here has nothing to do with that of a man named Grothendieck (theory mentioned here for the first and last time, without further reference or precision).

3 °) There is a famous conjecture, called "Hodge conjecture" (no matter what she is talking about), which the validity implies that the so-called "other" memorandum theory developed in gloss volume is identical to (a very special case) that I had developed, in full view of everyone, almost twenty years before.

I could add a 4 °) as the most prestigious of the four signatories of the book was my student,

and that is none other than me he has learned over the years that he has brilliant ideas there as

if he find them at the moment 52 (*), and 5 °) that these two circumstances are common knowledge among knowledgeable people, but it is in vain to seek in literature written records attesting

said that brilliant author could

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have learned something through me 53 (*), and 6 °) the delicate question p. L50

arithmetic which (according to what was explained to me the main author in person) is the central problem of the book (and my name is pronounced), was released by me in the sixties, in the

Following the "yoga of reasons", and that it is by me that the author had knowledge; and I could stack

still 7 ° and 8 ° etc. (which I certainly does not lack to do in his place).

The foregoing enough about me, that is it. To learn about such facts and wear

judgment about them, there is no need of "skills" special - **not to that level "it**

happens". The faculty is at stake here, other than sound reason (devoted in principle to everyone) is that I would call the name **of decency feeling**.

The book in question is now one of the most cited mathematical literature, and his "author spring

cipal", one of the most prestigious mathematicians of the time. That said and seen, the thing now far

The most remarkable to me in this story is that no one among the countless readers

50 (***) Of course, this is not the intention of the ten year old I wrote Crops and Seeds, and I speak to him

choose a language that is familiar to him.

51 (***) This is the first "major operation" Burial I have discovered a April 19, 1984, where it is also

imposed on me the name "Burial". On this subject the two notes written on the same day, "Memories of a dream - or birth reasons", and "The Burial - or New Father" (Res III, n ° s 51, 52) There is also a complete reference book which it will be question.

52 (*) I do not hear that there is not in this book ideas, and even great ideas, due to the author or other co-authors.

But the whole problem of the book, and the conceptual context that gives it meaning, and how long including the delicate theory

X-categories (wrongly called "tannakiennes"), which technically is the heart of the book are my work.

53 (*) With the exception however of a line in a report from the pen of Serre, in 1977, which will be discussed in its place.

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3. U DO LETTER

this book, even among those who know firsthand what it is, and who were my students, or my friends - that **nobody has seen anything unusual**. There is no one in any case, until today

As I write these lines, which is made known to me to express on this prestigious book any

Subject 54 (**).

As for those among my colleagues and old friends, who have never held this book in their hands and

avail themselves of to plead incompetence, I tell them there is no need to be "specialist" to ask

the volume in the first mathematical library came, flip it and see for yourself what

is not disputed by anyone. . .

3.15. Gangrene - or the spirit of the time (1)

15. The "pattern operation" is only one of the four "major operations" in the same water, and among

a cloud of other smaller and in the same spirit. It is no longer the "big" of

collective mystification that

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flesh out my "table manners" of an era, and above all the most iniquitous.

p. L51

It consisted only plunder the rich flock to for its absence (or death...), And not future period (in general indifference) strangle for fun and under his eyes, the poor sheep. And into mathematical language entered now in common usage, the seemingly innocuous names books, concepts or statements cited at any time, are themselves already a hoax or sham ⁵⁵, and bear witness to the way the disgrace of an era.

If I think I have ever done useful work for the "mathematical community," is to have increased to the full daylight a number of inglorious facts which faisandaient in shadow. The kind of facts, surely everyone knew him every day or nearly so, from near or far. How much he is among them who took the time to stop it was only a moment to sniff the air and look?

He who has found himself exposed to the morgue of some and the dishonesty of others (or themselves) perhaps he flattered that this was a special misfortune, devoted to him. Confronting his experience my testimony, perhaps he feels that this "bad luck" is also a name he gave to a **spirit of time**, which weighs on him as he weighs all. And (who knows?) Maybe it[©]he encourage to get involved in debate, which concerns as much as it concerns me.

But if this "dirty laundry" that "I spread out into the open" does not raise anything but snicker joyless of each polished embarrassment of others, in the indifference of all, a situation that was disorder will become very clear. (For those at least who still cares to use his eyes.) The traditional consensus of good faith and decency ⁵⁶, in the relationship

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between mathematicians and in that of his mathematician

p. L52

art, would now things of the past, "outdated". Without any international association of mathematicians has yet to proclaim it solemnly, that would be yet heard something and now almost official: now **all shots are allowed**, without any reservation or limitation for "brotherhood by cooptation" of those who have power in the mathematical world. All ideas magouillages

54 (***) There was in all and for all two colleagues (including Zoghman Mebkhout) who have expressed to me such "reserves". Or one nor the other can not pass for "readers" of this book. They looked out of curiosity, just to realize. . .

55 I think here, especially at unusual abbreviation "SGA 4 1

2 "(useful mixed numbers!), Which is a double deception to him

one (and one of the most cited acronyms in contemporary mathematical literature), and the names "Verdier duality" or "dual Verdier," "" conjecture of Deligne-Grothendieck, "or finally" tannakiennes categories "(where Tannaka, for once, is not because, as it was never consulted. . .). It will issue more detailed manner in its place.

56 When I speak of these "consensus in good faith and decency," I do not mean they were never violated. But then even they were violated, it was good to "transgressions" that it was, and the consensus themselves do not stay less accepted.

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3.16. amends - or the spirit of the time (2)

to lead by the nose the apathetic reader who asks only believe, all paternity trafficking, and quotes cage between cronies and silence for those doomed to silence, and cronyism and falsification of all kinds and to the coarsest plagiarism in full view of everyone - **yes and amen to everything**, with blessing, by speech or by silence (when not with the active and eager) to all the "big names" and all the big and small bosses on the mathematical public. Yea and amen to "**New style**" who made fury! This was an art, here now, for assent (almost) unanimous, the Fair to confuse and grabs under the paternal eye of the leaders.

There was a time or the exercise of power, in the world of mathematicians, was limited by consenting plus unanimous and intangible expression of a collective sense of **decency**. These consensus and sense would now be obsolete and outdated things, certainly unworthy of the glorious era of computers, spatial cells and the neutron bomb.

It would be something gained and now sealed: power, for the brotherhood of those who have, is a **discretion**.

3.16. amends - or the spirit of the time (2)

16. In the letter, I said enough, I think, on the spirit in which I wrote Crops

Sowing and to make it clear that I do not pretend there to work as a historian. This is a testimony in good faith, for a experienced first hand, and to reflect on this experience. Testimony and reflection are available to all, including the historian, who can use it as a material among others. It is to him that it is therefore submitting this material to critical analysis, conformity the rigorous canons of his art.

It should, of course, to distinguish between the facts in the narrow sense (the "**facts gross**" or "material facts") and "assessment" or

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" **Interpretation** " of the facts, which gives them a **meaning** , which is not the same for p. L53 an observer (or a co-actor) and for another. Roughly speaking, one can say that the aspect of "witness" of Crops and Seeds to the facts, and that its "reflection" their interpretation, ie my job to give them meaning. Among the "facts" forming the testimony, I also ranks the "facts psychic " , including feelings, associations and images of all kinds that my testimony is reflection, that they take place in a more or less distant, or at the time of writing. In fact I describe and which I state in Crops and Seeds, I distinguish three kinds of **sources** . There are facts that restores my **memory** , more or less accurate, more or less of an opportunity blur to another, and sometimes distorted. To them, I can vouch for the provisions of truth when As I write, but not to the absence of any errors. On the contrary, I had the opportunity to meet some number, retail errors I noted in their place by footnotes subsequent page. There, on the other hand, **written documents** , including letters and especially scientific publications in due form, which I refer to the occasion with any desirable accuracy. There is, finally, the **testimony of third parties** . Sometimes it comes in addition to my own memories, allowing me to revive them, clarify and sometimes correct. In some rare occasions (which I will come back later), this testimony brings me entirely new information in relation to those already known to me. When I happen to echo of such testimony, it does not mean I had the opportunity to verify the accuracy and the validity of the line, but simply that it is inserted sufficiently so ment plausible in the rich fabric of facts that were known to me firsthand to drive my conviction (A right or wrong...) That the evidence corresponded, essentially, to the truth.

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3. U DO LETTER

To a careful reader, I think there will be any difficulty at any time, to do "on the part of things "between the account of the facts and the interpretation thereof, and (in the first case) to discern, among the three sources that I have just described, which comes in.

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When I referred to the moment the testimony of a third person, which I made without echo p. L54

being able to "verify the correctness of the line", it is that of **Zoghman Mebkhout** , about the vast operation retraction about his work. Among the "material facts" which I state Crops and Seeds, the only ones to present controversial or, in my own judgment now require rectification, are some of the facts stated by the only witness to Mebkhout. For end this postscript, I would like to present here critical comments about the version of the "case Mebkhout "presented in the preliminary draw Crops and Seeds. Comments and corrections More detailed will be included, each one in its place, in the print edition (constituting the text final Crops and Seeds).

The "Mebkhout version of" I@e wanted me to interpret, seems to consist mainly in the two theses as follows:

1. Between 1972 and 1979, Mebkhout was only 57 , in the general indifference and drawing my work to develop the "philosophy of the 3-Modules", as a new theory of "coefficients cohomological "in my opinion.

2. There would have been a unanimous consensus, both in France and internationally, to retract his name and its role in this new theory, once its scope has begun to be recognized.

This version was heavily documented, firstly by publications Mebkhout quite convincing cantes, else seemed by many other authors publications (including, for those of **Acts** of Symposium Luminy June 1981), where the deliberate retraction can be no doubt. Finally, more circumstantial than Mebkhout subsequently provided me (and I am echoing in part "The Burial (3) - or the Four Operations"), not directly verifiable, consistent, however, fully with some general atmosphere, the reality could not do for me no doubt.

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I just read about several developments 58 that show it is necessary to qualify strongly p. L55

ment point 1 °) above. The isolation in which Mebkhout was 59 was indeed real, but it was relative isolation. There was in France the work of **JP Ramis** in the same subject (whose work Mebkhout not said a word to me), and especially, it appears that some important ideas developed and completed by Mebkhout and which he attributed authorship, could be due to Kashiwara 60 . So it makes invraisem- 57 Except for constructability Kashiwara theorem of 1975, whose importance in the theory is not contested.

But according to the version of Mebkhout this would be the only contribution of Kashiwara the theory being born. This

Version (inaccurate) was confirmed by the absence of other publications Kashiwara, where he would have at least alluded to some the key ideas.

58 I am grateful to Pierre Schapira and Christian Houzel for kindly drawn my attention to these facts, and the tendentiousness of my presentation Mebkhout-Kashiwara dispute.

59 This isolation came primarily from the indifference of my former students to the ideas and work of Mebkhout who pretended stubbornly to draw an "ancestor" doomed to oblivion by a unanimous consensus. . .

60 The most important of these ideas is that of the "match" (to use the new style jargon) called "Riemann-Hilbert" for 3-modules. The relevant conjecture was proved by Mebkhout and also (according to what I said Schapira) by Kashiwara (while Mebkhout assured me that his demonstration was the only published). The question of priority for
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3.16. amends - or the spirit of the time (2)

lar or questionable some of the episodes of the Kashiwara-Mebkhout dispute, as reported in the Version Mebkhout which I made the (too) faithful interpreter.

There is no doubt that at the "work room" as also by the design of some of ideas he has managed to finalize, Mebkhout has been a leading pioneer of the new theory 3-modules, perhaps **the** main pioneer; Only in any case that is invested body and soul This task then, the true scope still escaped him, as she escaped at all. And it is also true the retraction operation that took place around this work, culminating with the operation Symposium Luminy, remains for me one of the great misfortunes of the century in the mathematical world. But it would be wrong to claim (as I did it in good faith) that Mebkhout was alone in the task. By cons, it was the only to have the honesty and courage to make clear the importance of my ideas and my work in its work and the emergence of the new theory.

This is not the place in this postscript to get into more details on this case - I will do in its place, including the nature of comments to illuminate the psychological context of the "Version Mebkhout".

If the "litigation Mebkhout-Kashiwara" has for my interest is only to the extent where it illuminates the general mood of an era. And for me, down to the same deformations and forces who played for bring out the "Mebkhout Version" appears also, among other materials less questionable that I bring in "a record time", a "sign of the times" telling.

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I still have to make amends for lightness, presenting the Mebkhout-Kashiwara a dispute p. L56 table only considered the evidence and documents provided by Mebkhout and this, as if this version could not be any doubt. This version had a third person in one day ridiculous or obnoxious, more reason to be cautious. For my light and for this lack of healthy caution, I present here willingly to Mr. Kashiwara my sincerest apologies. demonstration is for me nebula, and waive spend the rest of my days to clarify. . .

As for the statement-sister in terms of 3^∞ modules, it does not seem to be any doubt that the day paternity and the idea for demonstration belongs to Mebkhout.
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4. Introduction

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4.1. (I) The five-leaf clover

4.1.1. 1. Dream and fulfillment

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There will be three years in July, I had an unusual dream. If I say "unusual" is then p. I a print that appeared only after the fact, looking back upon waking. The dream itself came to me as the most natural, the most obvious of the world, without fanfare - even to the point that awakening; I almost did not pay attention, push into oblivion without more to go to "order Day. "Since the day I was shipped off to reflect on my relationship to mathematics. It was the first time in my life that I took the trouble to go - and again, if I got into it at that time there, it was really that I was almost under duress! There was such strange things, not say violent, that had happened in the months and in previous years, kinds of explosions mathematical passion bursting into my life without warning, it was not really possible to continue not watching what was happening.

The dream I speak contained no script or action of any kind. It consisted of a single picture, still, but at the same time very lively. It was the head of a person seen in profile. You could see the looking from right to left. It was a mature man, beardless, crazy hair making around the head like a halo force. The impression especially that emanated from the head was that of a force youthful, joyful, which seemed to spring from the flexible and sturdy bow neck (we guessed more than is saw). The facial expression was more that of a mischievous urchin, delighted some blow he would come

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4. Introduction

or to meditate, that of the mature man, or one who would take the plate, ripe or not. They especially off an intense exhilaration, contained fusing in.. .

There was not a second person present, an "I" would have looked and beheld the other, including we only saw the head. But there was a strong perception of this head, which emanated from her. There had either person to feel impressions, comment on them, name them, or to paste a name Perceived person, designate it as "such". There was this very living thing, this man@head, and also living perception, intense this thing.

As for the clock, without deliberation, I remembered the dreams

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last night, the vision of the head

p. II

man did not appear on the numbers with special intensity, it does not push forward to yell at me or blow me, it@me you need to look at! When that dream appeared in the field my quick look at the dreams of the night in the warm stillness of the bed, I had of course this reflex of the mind awake to put a name to what was seen. I do not also have to look, it was enough that I ask the question to find out as soon as the head of a man who had been there in the dream was none other than my own. It is not bad that one, I thought then, you still have to do, to see yourself as in a dream that, as if it was another! This dream came there as if, while walking and the largest chance, I came across a four-leaf clover, or even five to amaze me in a moment as it should be, and continue my path as if nothing had happened.

That@how at least that it almost happened. Fortunately, as it happened to me many both in situations like this, I still gained and black on white consciousness noted that small incident "not bad", beginning a discussion that was supposed to continue the momentum from that of the Eve. Then one thing led to the discussion that day was limited to delve into the meaning of this dream without pretension, this unique image and message on myself it brought me.

This is not the place to dwell on what this meditation one day taught me and brought. Or rather, that this **dream** has taught me and brought, once I had put myself in the provisions of attention, listening which allowed me to receive what he had to say. A first immediate fruit of dreams and this listening was a sudden influx of new energy. That energy carried the lengthy meditation that has continued in the following months, against inner resistance stubborn, that I had to disassemble one by one by a patient and persistent work.

For five years I began to pay attention to some of the dreams that came to me, it was the first "dream messenger" who did not present under the appearances, recognizable now, such a dream, with impressive scenic resources and an exceptional view of intensity, sometimes overwhelming.

This was all that was "cool" with nothing to force attention, discretion itself - it was to take, or leave without stories.

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A few weeks ago came a messenger dream in the old style, the dramatic tune

p. III

and even wild, which put a sudden and immediate end to a long period of mathematical frenzy. The only relative apparent between the two dreams is that in one or the other there was an observer. By

a parable of a lapidary force that dream showed something was happening in my life, without I take the trouble to pay attention to it - something I took very great care to ignore, frankly. It is this dream that made me so understand the urgency of a process of reflection in which I engaged A few weeks later, and which then continued for nearly six months. I have occasion to speak as little bit in the last part of this reflection-testimony " **Crops and Seeds** " which opens this volume and gives it its name ¹ .

1 See in particular section 43, "The killjoy boss - or the pot to pressure."

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4.1. (I) The five-leaf clover

When I began this introduction by the evocation of that other dream, the image-viewing myself ("Traumgesicht meiner selbst" as I called it in my notes in German), it is because in these recent weeks the thought of that dream came back to me more than once, while meditating "on a past mathematician "was moving towards its end. In fact, in retrospect, three years have passed since that dream appear to me as years of settling and maturing towards fulfillment its simple, clear message. The dream showed me " **as I am** ." It was also clear that in my waking life I was not fully that the dream showed me - the weight and stiffness from far were (and still are) often obstacle that I am fully and just myself. During these years, while the thought of this dream was mine rarely Yet this dream had to act in a way. It was not as a kind of model or ideal to which I would have tried to look like, but as the gentle reminder of joyful simplicity "was me", manifested in many ways, and was called to break free of what was going to affect her and reach their potential. This dream was a delicate and vigorous link to the time between a present weighted yet in many weight from the past, and "tomorrow" so close that it now contains the seeds, a "tomorrow" that me now, and in me always surely. . .

Surely, though in recent weeks it rarely mentioned dream was well again now, is that a certain level which is not that of a

0 thought that probe and analysis, I had to "know" that the work I was p. IV making and lead to an end, work resumed and deepened this other work there three years was a further step towards the completion of the message on myself it brought me.

This is now for me the main direction of Crops and Seeds, this intense work of nearly two month. Only now it is over, I realize how important it was for me to do.

During this work, I have known many moments of joy, a joy often mischievous, blagueuse, exuberant. And there were also moments of sadness, and times when I was reliving frustrations or penalties that hit me painfully in recent years - but there was no one moment of bitterness. I leave this work to the complete satisfaction of one who knows he has conducted work to an end. There is something so "small" is it that I have avoided, or he would have given my heart to say and I would not have said, and at that moment I would leave the residue of dissatisfaction, of regret, if "small" They are.

In writing this testimony, it was clear to me that it will not please everyone. It is even well possible that I found way to dissatisfy everybody without exception. This was however not my purpose, nor to displease anyone. My purpose was simply to look at things simple and important things everyday, my past (and sometimes my present too) mathematician, finally to discover (better late than never!) and without doubt or reservation, they were and what they are; and on the way, say in simple words what I saw.

4.1.2. 2. The spirit of a trip

This reflection which eventually became "Crops and Seeds" began as an "introduction" to first volume (nearing completion) to " **In the Fields of Pursuit** ", the first mathematical work I intend to publication since 1970. I wrote the first few pages to a low point in June last year, and I took this thinking there is less than two months, to the point where I had left. I was aware that there were many things to look at and say, I was expecting an introduction relatively expanded, thirty or forty pages. Then, during the nearly two months that followed, until even now

0 As I write this new introduction to what was first an introduction, I thought each p. v

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4. Introduction

day it was when I was finishing this work, or it would be the next day or two at worst. As After a few weeks I began to approach the course of hundreds of pages, the introduction was

promoted "introductory chapter". After few weeks, when the dimensions of said "chapter" themselves located far exceed those of other chapters of the volume in preparation (all completed at the time of writing these lines except the last), I finally understood that his place was not in a math book that definitely this reflection and testimony would be cramped. Their true place was in a separate volume, which will Volume 1 of these " **Reflections Mathematics** " I intend to continue in the coming years on launched the Fields of Pursuit.

I would not say Crops and Seeds, the first volume in the series of Mathematical Reflections (Which will be followed by two or three volumes of Continued Fields, for starters) is a volume of "induction" to Reflections. Rather, I see this first volume as the foundation of what is to come, or rather, as one that gives the base note, **the spirit** in which I begin this new journey, I intend to continue in the coming years, and that will lead me I can not say where.

To complete these details on the main section of this volume, some indications of practical nature. The reader will not be surprised to find in the text Crops and Seeds of references the occasional "this volume" - understood, the first volume (Models of History) of the Continuation Champs, which I think still be writing the introduction. I did not want to "fix" these passages taking primarily to uphold the text spontaneity and authenticity of not only a testimony distant past, but on the same time of writing.

It is also for the same reason that my edits of the first draft of the text were confined to correct clumsiness of style or sometimes confused expression that hindered understanding of what wanted Express. These alterations may have led me to a clearer understanding or finer until writing the first jet. Modifications so little of it substantial for nuanced, the clear, supplementing or (sometimes) correct, are subject to a fifty **Notes** numbered, clustered at the end of reflection, and constitute more than a quarter of the text 2 . I refer by abbreviations as (1) etc. . . Among these notes, I have distinguished twenty who seemed of comparable importance (by length or substance) to that of any one of fifty "sections" or "sections" in which spontaneously reflection was organized. These longer notes were included in the table of contents, after the list of fifty sections. As expected, for some long notes, he found the need add one or more notes to the note. These are then included as a result of it, with the same type referrals, except rather short notes, which then appear on the same page in "low-notes" with references such as or.

I have had great pleasure in giving a name to each of the sections of the text, as well as each of the most balanced substantial - besides thereafter, it proved indispensable to find me. he goes probably say, these names were found afterwards, when in starting a section or Note a bit long I could not have said no to what would be the essential substance. It is the same let alone the names (such as "Labor and discovery", etc....) by which I designated the eight parts I to VIII in which I have grouped the aftermath cinquantés sections that make up the text.

For the content of these eight parts, I shall confine myself to very brief comments. The first two I (Labor and discovery) and II (Dream and the Dreamer) contain elements of a reflection on the work mathematics, and the general discovery work. My person is involved in a much

2 (May 28) It is here the text of the first part of Crops and Seeds, "Fatuité and Renewal". The second part was not written at the time of this writing.

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4.1. (I) The five-leaf clover

more episodic and less direct than in the following sections. These are they who primarily quality of evidence and meditation. Parts III to VI are mostly a reflection and testimony on my past mathematician "in the mathematical world," between 1948 and 1970. The motivation in this meditation was above all the desire to understand the past, in an effort to understand and assume a present in some sometimes disappointing or confusing aspects. Parts VII (The Child fun) and VIII (The solitary adventure) rather concern the evolution of my relationship to mathematics from 1970 to today, that is to say, since I left "the world mathematicians" never to return. I examines particular motivations, and strengths and circumstances that led me (to my own surprise) to take a mathematical activity "public" (by writing

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and by publishing Reflections Mathematics), p. VII after a gap of over thirteen years.

4.1.3. 3. Compass and luggage

I would have to say a word about two other texts which are with Crops and Seeds this volume of the same name.

The " **Sketch of a Program** " gives an outline of the main themes of mathematical thinking I have pursued over the past decade. I count at least develop some so slightly some in the coming years, in a series of informal discussions which I have already had occasion to speak, the "Reflections Mathematics". This sketch is the verbatim reproduction of a report that I wrote

January to support my application for a research position at CNRS. I have included in this volume, because obviously this program far exceeds the possibilities of my modest person, even if it were given to me to live another hundred years and I choose to use them to pursue as far as I can the topics in question.

The " **thematic Sketch** " was written in 1972 on the occasion of another application (for a position of vocational sor at the Collège de France). It contains a sketch by themes, what I considered then as my main mathematical contributions. This text is affected provisions in which it was written, a when my interest in mathematics was all that was marginal to say the least. also this sketch she is not much better than a dry and methodical enumeration (but fortunately not intended not to be exhaustive. . .). It does not seem driven by a vision or the breath of a desire - as if these things that I reviewed as a matter of conscience (and that were there indeed my arrangements) had never been touched by a living vision, not by a passion to take the day as they were still only approached behind their veils of mist and shadow. . .

If, however, I decided to include here the report uninspiring I fear, it is mainly to close the spout (Assuming that this is thing possible) to some high-flying colleagues and some fashion, that since I left a world that was common affect us look down on what they kindly call of "grothendieckeries". This, it seems, synonymous bombinage on too trivial things for a serious mathematician and

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tasteful consents to lose over them certainly valuable time. Maybe that "digest" p. VIII indigestible them there appear more "serious"! As for the texts from my pen a vision and a passion anime, they are not for those that mode maintains and justifies a sufficiency, making them insensitive to things that delight me. If I write for others than for myself, it©for those who do not find their time and person too valuable to continue without tiring the obvious things that nobody deigns to see, and to rejoice in the intimate beauty of each discovered things, distinguishing it from any another that we had known in her own beauty.

If I wanted to lie to each other all the texts that make up this volume, and

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roles in this journey in which there embarked with Reflections Mathematics, I could that reflection-witness Crops and Seeds reflects and describes **the spirit** in which I undertake this Travel and gives it meaning. The outline of a program described my sources of inspiration that set a **management** if not certainly a destination for this journey into the unknown, like a bit of a compass, or vigorous breadcrumb. The thematic outline finally reviewed quickly a **background** , acquired in my past mathematician before 1970, part of which at least will be useful and welcome in such or that stage of the journey (as my reflexes and topossique cohomological algebra are indispensable to me now in the Continuation of Fields). And the order in which these three texts follow, such as their respective lengths, reflect well (without deliberate on my part) the importance and the weight I their grants in this journey, the first step is nearing its end.

4.1.4. 4. A trip to the prosecution of obvious things

It would take me say a few more words on this detailed trip undertaken for a little over a year, Mathematics Reflections. Let me explain in some detail, in the first eight sections Crops and Seeds (ie in parts I and II of reflection) about **the spirit** in which I undertake this trip, which I think is apparent now in this first volume, as also in one that follows it (the Models of History, which is Volume 1 of the Continuation of fields), being completion. It seems to me unnecessary to dwell on it in this introduction.

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I can certainly predict what the travel undertaken, something that I will discover as and as he

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will continue. I do not have to present a planned route even in outline, and I doubt that he will release one soon. As I said before, the main themes that are likely inspire my thoughts are sketched more or less in the "Outline of a Program", the "text-compass". Among these themes, there is also the main theme of the Continuing field, that is to say, the "fields", which I hope well shop around (and stand there) during this year, two or maybe three volumes. the about this subject I am writing in the sketch: "This is like a debt which I acquit vis-à-vis... a scientific past where for fifteen years (between 1955 and 1970), the development of tools cohomological was the constant leitmotif in my work foundations of algebraic geometry. " It is there, among the planned topics, one that is rooted most strongly in my "past" scientific. It is also one that has remained present as a whole regret during these fifteen years, as the most glaring deficiency of all may be the work I had left to do when I left the mathematical scene, and none of my students or former friends no one cared to fill. For more Details on this work in progress, the interested reader is referred to the relevant section in the Sketch

a program, or the introduction (real this time) of the first volume being completed, the Fields pursuit.

As another legacy of my scientific past that is close to my heart, there is above all the notion of **reason**, which is still waiting to get out of the night she remained held, for a good fifteen years yet it has emerged. It is not excluded that I finally get to work on foundation that is needed here, so nobody better placed than me (by a younger age, as well as by tools and knowledge available to it) does decide to do so in the next few years.

I take this opportunity to point out that the fortune (or rather misfortune ...) the concept of reason and among a few other ones I learned the day and between all seem to me (in power) the more fruitful, are the subject of a retrospective reflection of some twenty pages, forming more

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long (and the latest) "notes" to Crops and Seeds ³. I afterwards divided this note in two parts

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("My orphans" and "Denial of inheritance - or the price of a contradiction"), plus three percent. X "subscores" who follow ⁴. This set of five consecutive notes is the only part of Crops and Seeds that are mentioned mathematical concepts other than by passing allusions. these notions get the opportunity to illustrate some contradictions within the world of mathematicians, who themselves reflect contradictions in the people themselves. I thought at one time to separate this sprawling note of the text from which it comes, to join the thematic outline. This would have the advantage of putting it into perspective, and to infuse some life to a text that looks a little too a catalog. I have yet failed to do, in order to preserve the authenticity of testimony méganote with this, whether I like it or not, is indeed part.

In what is said in Crops and Seeds on the provisions in which I discuss "Reflections", I here would add one thing on which I spoke already in one of the notes ("The snobbery young - or defenders of purity "), when I write: " My ambition mathematician my life, or rather my joy and passion, were constantly discovering the obvious things, and this is my only ambition as in this book "(A Pursuit of Fields). This is my only ambition also for this new journey that I continue for a year with Reflections. It has not been different in these Crops and Seeds that (for my readers at least, if it is found) open this trip.

4.1.5. 5. Welcome debt

I would like to conclude this introduction with a few words about the two signings in this volume "Crops and Seeds".

The dedication "to those who were my students, to whom I gave the best of myself - and also the worst" has was present in me at least since last summer, especially when I wrote the first four sections what was still supposed to be an introduction to a mathematical structure. That is, I knew, in fact some years ago, there was a "worse" to consider - and it was now the time or never ! (But I had no idea that this "worse" would eventually lead me through a meditation near two hundred pages.)

For cons, the dedication "to those who were my seniors" appeared along the way only, as the very name of this reflection

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(now also that of a volume). This has revealed the important role p. XI who was the mathematician them in my life, a role whose effects remain alive today. it probably appear quite clearly in the following pages - to make it unnecessary to dwell here to subject. These "elders", in order (approximate) appear in my life when I was twenty, are Henri Cartan, Claude Chevalley, André Weil, Jean-Pierre Serre, Laurent Schwartz, Jean Dieudonné, Roger Godement, Jean Delsarte. The newcomer ignoramus that I was kindly received by each of them, and then many of them gave me a lasting friendship and affection. I must also mention Jean Leray, whose warm welcome: during my first contact with the "world of mathematicians "(in 1948/49) was also a great encouragement. My reflection showed a debt of gratitude to each of these men "from another world and another destiny." That debt is not a weight. His discovery came as a joy, and made me lighter.

End March 1984

³ This double rating (n ° s 46, 47) and its sub-notes were included in the second part of "The Burial" Crops and Seeds, which constitutes a direct continuation.

⁴ It is the subscores n ° s 48, 49, 50 (footnote ° 48 @as added later).

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4.2. (II) An act of respect

(- May 4 -... June)

4.2.1. 6. The Burial

An unexpected event revived a reflection that was completed. He inaugurated a waterfall discovered large and small green over the past weeks, gradually revealing a situation that was remained unclear and by sharpening edges. This particular leads me to go out in detail and approfondie in events and situations that he had previously discussed only in passing or referring. So the "retrospective reflection of fifteen pages" on the vicissitudes of a work, which discussed previously (Introduction, 4) has assumed unexpected dimensions, is increasing by some Two hundred additional pages.

By force of circumstances and by the inner logic of reflection, I have come way to involve others as much as myself. Whoever is involved more than any other (except me) is a man which binds me a friendship of nearly twenty years. I wrote him (euphemistically 5) that he had "

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a little face

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student "in the early years of this affectionate friendship rooted in a passion, and long and in my heart of hearts I saw in him a kind of "legitimate heir" of what I thought can bring mathematics beyond a published work remained fragmentary. Many will who already have recognized: it is **Pierre Deligne** .

I do not apologize to go public with these notes, among others, a personal reflection on a personal relationship, and to involve and without consulting him. I consider it important and healthy for everyone, a situation long remained hidden and confused is finally brought to light and examined. In doing so, I bring a witness, admittedly subjective and does not claim to exhaust a delicate and complex situation, nor error-free. His first merit (like my previous publications, or those on which I work now) is to exist, available to those it may concern. My concern was neither of convince, nor to make me immune to error or doubt behind the only things called "patent". My concern is to be true, saying such things as I see or sense, every moment - as a means to deepen and understand.

The name "**The Burial**", for the set of all notes to the "weight of the past", was imposed with increasing force during the reflection 6 . I play the role of the early deceased in the funeral the company of some mathematicians (much younger) whose work comes after my "start" in 1970 and bears the mark of my influence, a certain style and a certain approach to mathematics. Foremost among these is my friend **Zoghman Mebkhout** , which took the heavy privilege to have at face all the handicaps of the treaty "student Grothendieck after 1970" without having provided the advantage of contact with me and my encouragement and my advice while he was "student" that my work through my writings. It was at the time (it haunts the world) I was already figure "Deceased" to the point that for a long time the idea of a meeting apparently did not show up, and an ongoing relationship (personal as mathematical as) has ended up tying last year.

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5 On the meaning of this "understatement"; see note "Being apart", n ° 57 ©

6 Towards the end of this reflection, another name appeared, expressing another striking appearance of a picture that was gradually revealed to me over the past five weeks. This is the name of a story, which I will go his place: "The dress of the Emperor of China." . .

7 By the end of this reflection, another name appeared, expressing another striking appearance of a picture that was

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That did not stop Mebkhout against the current of a tyrannical fashion and disdainful of his elders (which p. XIII were my students) and an almost complete isolation, to new and profound work, a synthesis unexpected school ideas Sato and mine. This work provides a new take on the cohomology analytic and algebraic varieties, and carries the promise of a major renewal in our understanding of this cohomology. No doubt this would be accomplished thing renewal now and for years, if Mebkhout had found with all those nominated for this home warm and wholehearted support they once received from me. At least since October 1980 ideas and work provided inspiration and the technical means of a spectacular restart the cohomology theory of algebraic varieties, finally out (besides the results of Deligne around Weil conjectures) of a long period of stagnation.

unbelievable yet true enough, his ideas and results in nearly four years used by "all"

(Just like mine), while his name remains studiously ignored by you and even those who know his work first hand and use it in an essential way in their work. I do not know whether to any other time mathematics has experienced such a disgrace, when some of the most influential or more prestigious among his followers lead by example, to general indifference, contempt of the rule more universally accepted in the ethics of mathematician business.

I see four men, with brilliant mathematicians means that have and are entitled to with me honors of the funeral by silence and disdain. And I see in all the contempt bite on beautiful passion that had animated.

Apart from these, I see especially two men placed either under the spotlight on the square Public mathematics, officiating at funerals and numerous company at the same time (in a more hidden meaning) are buried and their own hands, along with those they bury about to deliberate. I have already appointed one of them. The other is a former student and an old friend, **Jean-Louis Verdier**. After my "departure" from 1970, contact between him and me was not maintained, with a few hasty meetings at the professional level. That's why probably it

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is included in this reflection at p. XIV

through certain acts of his career, while possible motives for these acts, in his relationship to me, are not examined and escape me elsewhere entirely.

If there is a pressing question that came to me throughout the years, which was a deep motivation Crops and Seeds and followed me as throughout this reflection, it is the the part that comes to mind in the advent of a certain spirit and morals that make possible disgraces like I said, in a world that was mine and which I had identified during more than twenty years of my life of mathematician. The reflection made me discover by certain attitudes fatuity in me, speaking by tacit disdain for fellow of modest means, and a complacency myself and such brilliant mathematicians provided means, I have not been abroad in this spirit that I see spread today among the very people I had loved, and among those also which I taught a job that I loved; those I unloved and poorly taught and who now set the tone (when they do law) in this world that was dear to me and I left.

I feel a breath of wind sufficiency, cynicism and contempt. "It blows without worrying about" merit "or of "demerit", burning with his breath the lowly vocations as the most beautiful passions. . . ". I understood that this wind is the prolific harvest of indiscriminate and careless planting that I helped to sow. And if his breath back on me and what I had given to other hands, and those I love today gradually revealed to me over the past five weeks. This is the name of a story, which I will go his place: "The dress of the Emperor of China." . .

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who dared to claim or just learn from me, this is a **turn of events** which I have no reason to I complain, and that has much to teach me.

4.2.2. 7. The Scheduling Funerals

Under the name "The Burial", so I grouped in the table of contents the imposing main parade "Notes" related to this innocuous appearance section "The weight of the past" (S.50), giving everything meaning the name that immediately had imposed on me for this final section of the "first draft" of crops and Sowing.

In this long procession of notes with multiple relatives, those that accompany them during the four past weeks (notes (51) to (97)) 8 0

stand out as the only dated (April 19 to May 24) 9 . he

p. XV

seemed most natural to them in chronological order in which they succeed in thinking 10 , rather than in some other order said "logic"; or the order of the references to these notes in previous notes. To find this last order (not linear) of filiation between Notes

Participating I followed (in the table of contents) on each number to that of the note (from those that precede it) where it is first made reference to it 11 , or (if) by the number of that which it is an immediate continuation 12 . (The latter relationship is indicated in the text itself by

Reference symbol placed at the end of the first note, as (⇒ 47) placed at the end of the last line of the note (46), which refers to Note (47) continued.) Finally, some kind of clarification so little technical

to a note are grouped at the end of it in numbered subscores by consecutive indices

number of primitive note - as in the sub-ratings (46 1) to (46 9) Note (46) "My orphans".

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For some structure to the overall scheduling of the Burial and allow it to re-

p. XVI

know in the multitude of notes flock there, it seemed to me sitting up for the occasion to include in the procession some seriously suggestive subtitle, each preceding and leading a long procession or short

of consecutive notes linked by a common theme.

I was so pleased to see assemble one by one in a long solemn procession from honor my funeral, ten 13 processions - some humble, some impressive, some contrite and other secretly cheering, as it can not be otherwise on such occasions. Here advance: **the posthumous student** (that everyone makes a point of ignoring) the **orphans** (freshly exhumed for the occasion), the **Fashion** and **illustrious men** (I deserved it), the **reasons** (last born and exhumed last of all my

8 It still must be added footnote ° 104 of 12 May 1984. The notes n ° 98 and following (except the previous footnote ° 104) constitute the "third wind" of reflection, as of 22 September 1984. They are also dated.

9 In a series of consecutive notes written on the same day, only the first is dated. Other undated notes notes n ° s 44 to 50 (forming processions I, II, III). Notes n ° s 46, 47, 50 are of 30 or 31 March notes n ° s 44 ©48, 48©49 of the first half of April, finally footnote ° 44 "is dated (May 10).

10 I sometimes made a small amplitude inversion in this chronological order, for the benefit of an order "logic says," when he seemed that the overall impression of the process of reflection was not distorted. As exceptions, I point However, eleven ratings (whose number is preceded by the sign!) from notes b. p. Subsequent to a note and took prohibitive dimensions, and I have each placed after the note to which it relates (except footnote ° 98, is relating to n ° 47).

11 When the reference to a note (as (45)) is located in "The weight of the past" itself; is the number (50) the latter, **in brackets** , which is placed after that of the note, as in 46 (50).

12 The number of a note that is immediate continuation of a previous note (which numbers then follow) is preceded by * in the table of contents. * 47 Thus, 46 states that footnote ° 47 is a direct continuation of Note ° 46 (which is also not here that immediately preceding, which is footnote ° 46 9).

I finally **pointed out** in t. of m. the numbers of the notes which are not followed by another number, that is to say those represent a "new beginning" of reflection, do not insert in a particular place of reflection already done.

13 (29 September) In fact, there is finally twelve processions, by including the Funeral Van (x), and "The deceased (still dead)" (XI) which comes in extremis to sneak still in the procession. . .

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orphans), **my friend Pierre** modestly leading the largest processions, followed closely by **the Agreement Unanimous** notes (silently) and concertos by the **Colloquium** (said "Pervert") at full strength (if Departing from the posthumous student, aka the Student Unknown by funeral processions carrying flowers and interposed crowns); Finally, to close with dignity the imposing parade, here©yet to advance **the student** (no post hume let alone unknown) aka the **Boss** , followed by the busy band of my **students** (equipped force shovels and ropes) and finally **Van Funeral** (featuring four beautiful securely screwed oak coffins besides Gravedigger) ... ten processions finally at full strength (it was time) if carrying slowly to the **funeral ceremony** .

The highlight of the ceremony is the Eulogy Funeral, served with perfect tact by none other than my friend Peter in person presiding at the funeral in response to the wishes of all and to everyone©satisfaction. Ceremony ends in a final and definitive De Profundis (at least we hope), sung as a sincere action Thanksgiving by the late deceased himself, who unbeknownst to all survived his impressive funeral and leads took the seed, to its **complete satisfaction** - satisfaction which form the final grade and the final agreement Burial memorable.

4.2.3. 8. The end of a secret

During this final stage (hopefully) my reflection appeared the interest to join in "Appendix" the present volume 1 Reflections Mathematics

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two other texts, mathematical in nature, in addition to p. xvii three of which he previously discussed 14 .

The first is the reproduction of a **report** commented in two parts, which I had done in 1968 and 1969 on the work of P.Deligne (yet some still unpublished today), corresponding to an activity mathematics to IHES for three years 1965/67/68.

The other text is a sketch of a "**form of the six variances** ", bringing together the features common to a duality formalism (inspired by the duality of Poincaré and the Serre) that I had reached between 1956 and 1963 form was found to have a "universal" character of all duality situations cohomologic encountered so far. This formalism seems to have fallen into disuse with my departure from the scene mathematics, to the point that I know anyone (except me) has not taken the trouble to write out ONLY ment the list of basic operations, basic canonical isomorphisms which they lead, and essential compatibility between them.

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This sketch of a coherent form will be for me the obvious first step to this "vast array of in- p. xviii seems the **dream of reasons** , "which for more than fifteen years©awaits the bold mathematician who wishes well 14 Moreover, I think add to the Sketch Theme (see "Compass and baggage," Introduction, 3) a "comment" giving

some details about my contributions to the "themes" which are reviewed briefly, and also about influences that have played in the genesis of the major key ideas in my mathematical work. The retrospective of the past six weeks already shows (to my own surprise) a role of "detonator" Serre, for starting most of these ideas, as well as for some of the "great work" that I had asked, between 1955 and 1970. Finally, like other mathematical nature of the text (in the usual sense), and the only figure (incidentally) in the text not technical "Crops and Seeds", reports the sub-grade $n \circ 87$ in note "The Massacre" ($n \circ 87$), I explicitly with care it deserves a "discreet" variant (speculative) of Theorem familiar Riemann-Roch-Grothendieck in the context coherent. This conjecture was included (among many others) in the stated closing of the seminar SGA 5 1965/66 exposed of which only traces (nor many others) in the volume published eleven years later as the SGA 5. vicissitudes of the seminar crucial in the hands of some of my students, and links them with some "operation SGA4 1

2 "is gradually revealed during the reflection continued in notes \circ s 63 $\textcircled{67}$, 67 $\textcircled{68}$, 68 $\textcircled{84}$, 85, 85 $\textcircled{86}$, 87, 88.

As another note giving enough math comments expanded on the opportunity to reach a framework "topossique" common (wherever possible) the known cases where we have a duality formalism said "six operations", I also signals the sub-grade $n \circ 81$ 2 to the note "credit Thesis and comprehensive insurance $\textcircled{n} \circ 81$.

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brush. "Apparently, this mathematician will be other than myself. It is high time indeed that what was born and confided in privacy there nearly twenty years, not remain the privilege of a single but to be available to **all**, so last night the secret, and be born again in the full light of the day.

While it is true that only one, apart from me, had an intimate knowledge of this "yoga reasons" for having learned from my mouth as the days and years that preceded my departure. Of all the things mathematics that I had the privilege of discovering and bringing to light this reality appears to me the reasons yet as the most fascinating, the most full of mystery - in the heart of the profound identity between " geometry "and" arithmetic ". And the " yoga of reasons "which led me this long ignored reality perhaps the most powerful instrument of discovery that I have reached in this first period of my life mathematician.

But it is also true that this reality, and "yoga" that tries to identify the closest, had no way been kept secret from me. Absorbed by mandatory tasks of writing fundamentals (everyone since is happy to use such in its work every day), I have not taken few months required to prepare a comprehensive outline of all of the yoga patterns, and thus put available to all. I have not failed yet, in the years before my departure unexpected, to talk about chance encounters and who would listen, beginning with my students, who (except one of them) have forgotten as all have forgotten. If I spoke, it was not to place "inventions" who would bear my name, but to draw attention to a reality that is manifested at every step, as soon as is interested in cohomology of algebraic varieties and in particular, their "arithmetic" properties and relations between them different cohomology theories known to date. This reality is as tangible that once was one of the "infinitely small", perceived long before the onset of harsh language allow to apprehend in a perfect way and the "establishment". And to understand the reality of 0

reasons we

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Today \textcircled{e} not short of a flexible and adequate language nor a consummate experience in building mathematical theories that were missing from our predecessors.

If what I once shouted from the rooftops fell on deaf ears, and if the contemptuous silence of one collected echoing silence and lethargy of those who pretend to be interested in cohomology (And yet have eyes and hands like me...), I can not hold liable that one

one who chose to keep in his possession the "benefit" of what I had told him for all. Strength is that our time, whose unbridled scientific productivity rivals that invested in the arms or consumer goods, is very far from what "bold dynamism" of our predecessors the seventeenth century, which "did not go around the bush" to develop a calculation of infinitely small, undeterred by concern if this calculation was "speculative" or not; neither expect nor such Prestigious man among them deign to give them the green light to grab what everyone could see from his own eyes and felt firsthand.

4.2.4. 9. The stage and Actors

By its own internal structure and its particular theme, "The Burial" (which now form more half Harvests text and Seeds) is largely independent and logically the long reflection that precedes it. Yet it is a superficial independence. For me this thinking about a "funeral" gradually leaving unspoken the mist and sensed, is insé-comparable to that which preceded it, which it was formed and gives it meaning. begun as

4.2. (II) An act of respect

view, it has become without having planned or sought, a meditation on an important relationship in my life, leading me to turn to a reflection on the fate of this work in the hands of "those who were my students." Separate from this reflection that she spontaneously outcome seems to me a way to reduce it to a simple "Table manners" (or even, to a settling of accounts in the "beautiful world" mathematical). It is true that if it holds, the same reduction to a "table manners" can be made for crops and entire planting. Certainly morals that

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prevail at a time and in a given environment and contributing p. xx
to shape the lives of men who belong, are important and deserve to be described. It will be clear Yet for a careful reader of Crops and Seeds that my purpose is not to describe the manners, that is to say a certain **scene**, changing with time and from one place to another, on which our place is actions. This scene largely defines and delimits the **means** at the disposal of various forces in us, allowing them to express themselves. While the stage and the resources it provides (and the "rules of the game" it imposes) vary infinitely, the nature of the deep forces that we (the collective level) shape scenes and (at the person) talk about them seems to be the same from one medium or from one culture to another and from one era to another. If there is one thing in my life, except mathematics and out of love of women, which I have felt the mystery and attraction (late, it is true), it is the nature hidden some of these forces that have power to make us act to the "best" as in the "worst" to bury and to create.

4.2.5. 10. An act of respect

This thinking has ended up taking the name "The Burial" began as an **act of respect**. A respect for things that I had discovered, I saw condense and take shape in a void, which I was the first to experience the taste and vigor to which I gave a name to express and the knowledge I had of them, and my respect. To these things, I gave the best of myself. They have fed the force based in me, they grew and flourished, like branches multiple and vigorous springing from the same trunk living in the vigorous and multiple roots. These are alive and present things, not inventions we can do or not do - things closely solidarity in a living unit that is made of each and gives each its place and meaning, an origin and an end. I had left long ago and without any worry or regret, because I knew that what I left was healthy and strong and did not need me to grow and flourish again and multiply, according to his own nature. It was not a bag of money that I let that one could steal or a bunch tools that could rust or rot.

Yet over the years, when I thought I was far from a world that I had left, came back to me here and thence into my retirement as

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flushes insidious disregard and discrete derision designating such p. XXI
these things I knew strong and beautiful, who had their place and that no single function else could ever fill. I felt like orphans in a hostile world, a world sick of the disease contempt, their obsession with what is without armor. It is in these provisions has began this reflection, as an act vis-à-vis compliance with these things and therefore, vis-a-vis myself - as a reminder of a deep connection between these things and me: one who likes to assign a vis-a-vis disdain one of those things that were fed my love, it©me that he likes to be despised, and all that is from me.

And it is the same one who, knowing firsthand the link that connects me to this thing learned by none other than me, pretended to hold negligible or ignoring this link or claim (Was it tacitly and by omission) for or on behalf of others a "paternity" dummy. I see

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although clearly an act of contempt for a thing born of the worker as to the obscure and delicate work allowed this thing to be born, **and** for the worker, and above all (in a more hidden and more essential) for himself.

If my "back to math" should serve to make me remember this link and arouse in me the act respect to all - to those who affect to despise, and before the indifferent witnesses - this return will not have been useless.

It is true that I had really lost touch with the written and unwritten work (or at least not published) I had left. Beginning this reflection - I saw the branches distinctly enough without me too

However, remember that they were part of the same tree. Strangely enough, it was necessary that gradually unfolds in my eyes the picture of a **rampage** of what I had left, to find me in the direction of the living unit which was well dispersed and trashed. One won the ECU and the other a tool or two to rely or even to use it - but the unit that makes life and the true force of what I had left, she escaped to each and all. I know well that one yet felt deeply this unity and strength, and to background itself feels even today, and which likes to scatter the power within him to want to destroy this unity he felt in

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others through his work. In this living unity lies the beauty and

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the creative power of the work. Despite the devastation, I find them intact as if I had to leave - except that I have matured and now see with new eyes.

If something is yet sacked and mutilated, and defused of its original strength is in those forget the power that lies within themselves and who think their ransack something to thank you, as they cut only the creative power of what is available to them as it is available to all, but not to their thank you in person or authority.

So this reflection, and through it, this "return" unexpected, will also have me back in touch with forgotten beauty. It is to have fully felt the beauty that gives meaning to this act of respect awkwardly expressed in the note "My orphans" ¹⁵, and I just reiterate with full knowledge case here.

¹⁵ This note (n ° 46) is chronologically the first of all those in the Burial.

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