

THE CANAL AND THE WORKSHOPS

*From Processual Ontology
to the Gestures of the Craft*

David Bories

Tried by the Flow — A Processual Ontology of the Datum, continuity volume
The Canal and the Workshops — From Processual Ontology to the Gestures of the Craft

Conceived and directed by David Bories — Albi, France.

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Part I — The Concept at Work

Reminder and orientation

Note on the translation — This translation re-fixes the source text without displacing its substance. A few terms of the corpus have no obvious equivalent in English; the choices made, and how they are to be read, are set out in the section “Translation choices” at the end of the volume. This translation is not frozen: it will evolve with readers’ feedback and with the improvement of the means of translation. The French version is authoritative.

*Text written in May 2026. This part sets out stable conceptual reference points; it contains few dated elements. The concepts it recalls come from the trilogy *Tried by the Flow* and do not go stale. Only the illustrations used along the way are contingent and revisable.*

Chapter 1 — Reminder of the Foundations of the Trilogy

Why Begin with a Reminder

This book is a toolkit. But a tool is of no use if one has forgotten what it serves to do. Before breaking the processual grid down into gestures — historical, sectoral, operational, political —, one must hold it clearly in view. This first chapter teaches nothing new to anyone who has read the trilogy. It reformulates its reference points, in a language freed from the demonstrative machinery, so that one can come back to it at a glance while reading.

The trilogy *Tried by the Flow* followed the datum through three moments: its making, its circulation, its reception. The first tome, *The River and the Canal*, said how the datum is born; the second, *From Spring to Torrent*, how it travels; the third, *The Trace or the Datum*, how it arrives — or does not arrive — at someone. These three moments are not three distinct subjects: they are the three phases of one and the same thing. One understands making only by knowing that the datum made is, most often,

meant to circulate; one understands circulation only by knowing that it aims at a reading; and reading, in its turn, refers back to what was made and transmitted. Everything this book then proposes presupposes these three phases held together.

The reminder that follows goes through them in order. It is deliberately condensed. For each concept, it will be indicated which tome it comes from, so that the reader can, if they wish, go back to the source.

First Phase — Making (Tome 1)

Everything starts from a reversal. Common usage pictures the datum as an object that would pre-exist its collection: there would be, somewhere in the world, data waiting to be picked up. The first tome showed that this image is false. There are not, in the real, data that wait. There is a **flow of the real** — what happens, permanently, at all scales, indifferent to humans, which no one has dug and no one stops. And there are phenomena that become data only by being drawn — this is the observational route; a datum can also be institutional or derived.

Drawing is building a **flow of observation**: a flow that humans erect from the flow of the real, through the cadenced accumulation of drawings, according to criteria they have chosen and with an intention of their own. The flow of observation is faithful to the flow of the real relative to the criteria that defined it, without ever being a total replica of it. It is the central link of the ontology on its observational route: the datum is the elementary grain of a flow of observation. One does not pick a datum; one digs a canal in the river, and the datum is the water one draws from it.

Producing a datum requires two operations that the speed of modern apparatuses has merged, but that remain logically distinct. The first is the **act of inscription**: arresting a value, deciding that at this instant this continuous magnitude is worth such a quantity — making a cut in a flowing that of itself contains no break. The second is **fixation**: setting the arrested value durably on a medium.

From these two operations are born the **two times of the datum**, and with them the resolution of a paradox. A datum is frozen — once inscribed, it no longer changes — and yet it ages. How can a frozen thing age? Because it has not one time but two. In the **time of inscription**, it is eternal: the value inscribed remains what it is. In the **time of the real**, it ages: the real from which it was extracted goes on flowing, and the datum represents less and less faithfully a world that is moving away. These two times do not contradict each other, for they do not measure the same thing.

From this follows **freshness** — the proximity between the instant of the act and the present of the real — and its harshest law: freshness can never be recovered. The act of inscription is unique, dated, not repeatable. To have a fresh datum, there is only one means: performing a new act, now, on the present real. This new act does not refresh the old datum; it creates

another one, alongside it. **Lapse** is the moving-away of the time of the real, as the flow goes on flowing; it is not a uniform law, but a relation — **validity for a use**, which depends on the object aimed at, the question asked, the instant and the accepted tolerance.

The first tome set out still other reference points that this book will use. The **observational optimum**: each flow of observation has its own point of balance between the benefit one derives from drawing and its cost, below which one under-draws and beyond which one over-draws. The **loop**: some flows of observation transform the real they observe, so that observation is reflected in its object. The **systemic leap**: it happens that a change of technical regime does not merely move a cursor, but reconfigures the very nature of the relation to the datum. The **two deaths** of the datum, finally: lapse, which affects its representative validity without touching its existence, and disappearance, which makes the datum cease to exist — whether the medium degrades, the format becomes illegible for want of a machine to read it, or the datum is made permanently inaccessible. These two deaths are independent and call for different kinds of care. One will remember that disappearance is not only the physical destruction of the medium: it is any extinction of the datum as datum. The third tome will come back to it with a neighbouring but distinct case — the dead datum, where the medium survives intact but where no one any longer, anywhere, can interpret what it carries.

Beneath all this, two pillars that the first tome dug down to bedrock. The datum does not stand on its own: it stands on the **legibility of the real** — the flow, as it flows, leaves marks; it keeps a trace of itself, and that is what makes it drawable — and on the **existence of a reader** — the flow has produced, through its own flowing, a being capable of reading these marks. The datum is born at the exact meeting of these two pillars. And the **trace** is not the datum: the trace is the mark that the real leaves of itself, prior to any reading; it becomes a datum only through an act of inscription. One will remember this point, for the third phase will come back to it.

Second Phase — Circulation (Tome 2)

Humans do not make their data to keep them to themselves. The word says it: *donnée* comes from *datum*, what is given — given to someone, for a later occasion. A datum inscribed and never transmitted exists, constituted, but remains solitary, like water that does not flow; circulation is a frequent regime of the datum, not its universal destination. The second tome starts from there and derives from it a thesis twin to that of the first: **the datum navigates because it is fixed**. Far from being opposed, fixity and the journey condition each other — one transports only what holds.

Setting a datum in movement requires, here again, a gesture: the **act of exchange**, the second founding gesture after the act of inscription. And this gesture triggers a movement whose nature is less simple than it seems.

Transport is not the movement of a thing from one point to another. It is a **relation between two movements**: that of the datum towards the reader, and that of the reader towards the datum. Transport is accomplished when the datum's share is done and the reader's share is made practicable — not when the datum has simply “arrived” somewhere. This definition, which may seem abstract, is decisive for practice: it forbids believing that a datum “made available” is, by that fact alone, transmitted. As long as the reader cannot accomplish their share, the relation is impeded, and transport has not taken place.

Where transport concerns the elementary datum, **propagation** concerns the aggregate: the way whole flows spread, overlap, feed other flows. And transport has properties that are not neutral. Its **fidelity**: what arrives can be altered on the way. Its **temporality**: transporting takes time, and during this time the datum goes on ageing in the time of the real. Its strangest power, finally: transport **multiplies**. Making a datum travel is making a medium that carries it travel — or producing a copy elsewhere, that is, having it carried by a second medium without ceasing to have it carried by the first. The datum is not its medium: the medium is a rival good — this volume, that tablet, one cannot have it in two places at once —, but the fact it carries is not. In the dominant case, that of the copy, transporting a datum therefore does not move it; it duplicates it — and the copy, a new occurrence, carries the same fact as the original. A datum is not ceded like a thing passing from hand to hand; **it is shared like a fact**. Whoever transmits it is not dispossessed of it. This point is nothing specific to digital technology: the scribe who copied a text, the printer who ran off a thousand copies already multiplied the carriers of the same fact, on as many new media. Digital technology did not invent multiplication; it made it almost instantaneous and almost free, which changed its scale, not its nature. And this point, technical in appearance, founds on its own a large part of the political dimension: one cannot reason about the ownership of the fact carried as about that of the medium that carries it. This non-rivalry is ontological: it prejudices no legal regime, and rights over the medium, over the database, over the secret or over the person are each regulated in their own order.

The second tome also named a case that misleads intuition: **stable sources**. Some data seem motionless — the position of a star, the depth of a harbour. They are not: their real flows, but slowly, so slowly that with regard to our uses the datum seems not to age. Stability is not a property of the datum; it is a **ratio of speeds** between the flowing of the real and the rhythm of our needs. One “navigates in place” as long as this ratio holds — and it degrades as soon as one of the two speeds races.

This is precisely what defines the **torrent**. One would be tempted to oppose two flows: the flow of the real, natural and pure, and the torrent of data, artificial. This opposition is false, and correcting it is decisive: there is only one real that flows. The torrent is not a second flow alongside the first; it is a **regime** of this single real — the regime of the **real-marked-**

by-us, the one in which the cadence, extent, precision and speed of circulation of our drawings have reached such a point that we permanently tend hundreds of millions of flows of observation. The torrent is a wealth and a threat at once: an unprecedented power of reading the real, and a throughput that can submerge.

It swells through **self-amplification**: accelerated circulation produces data that call for other data, and the loop digs its own bed. Faced with this, the second tome opens a thread that the third will take up — **collective wisdom**. The point must be held with an exactness that makes it a reference point and not a stance. Abstaining from drawing, or from circulating, is an act that engages: abstention is not neutral. But — and this is the nuance that the tome establishes with care — abstention becomes a distinct position, one that can be weighed, only where the choice is *exposed*, made visible and deliberated collectively. It is a finding about the structure of collective choice, descriptive and valid at all times. It is not a recommendation to abstain, nor the endorsement of one model rather than another. We shall come back to it, for the confusion between finding and prescription is the main shoal of the political dimension.

The tome ends on a threshold: the moment when throughput, through sheer abundance, produces more data than any gaze can follow. This is **over-throughput** relative to the reader's window. Circulation has done everything it could do; there remains a share it cannot accomplish in anyone's place. This share is the object of the third phase.

Third Phase — Reception (Tome 3)

The third tome starts from the edge of the reader, where the second stopped. Its thesis, twin of the other two: **without reading, nothing is actualized**. The first tome had shown the outward journey — the real deposits traces, and an act of inscription, by surveying one of them, constitutes it as a datum. The third shows that a datum that no one reads remains constituted — not actualized, or mute for this reader; it falls back to the state of trace only in the limit case of the dead datum, when no reader any longer, anywhere, can interpret it. The passage from the constituted datum to the actualized datum occurs only in the act of reading, and only there.

This act requires, like the other two, to be named precisely. The **act of reading** is shorter than the act of inscription. Where inscribing mobilized perceiving, distinguishing, interpreting, aiming and inscribing, reading mobilizes only the first three gestures — **perceiving, distinguishing, deciphering** — and stops there. It does not aim; it does not inscribe: that would be producing a new datum, not reading the one that is there. One more clarification: the act of reading applies only to inscribed conventions — to what has been deposited by an act of inscription, even one delegated to an instrument. It does not apply to the raw traces of the real, which belong to another regime, that of the primary legibility set out by the first

tome.

The one who reads is a **situated reader**. They are not a point without thickness, a gaze from nowhere. They have a position, means, a code, a finite attention — a bounded **window**. No reading is from nowhere. And this window is finite before a throughput that is not: this is over-throughput seen from the reader. The machine itself, when it “reads”, does not escape this condition: it occupies a situated position of handling or processing, with its own bounds, and is an actual reader only if a meaning is actualized for it. The third tome takes care not to settle too quickly the asymmetry between human reading and automatic reading; it sets it out as an asymmetry to be examined, not as a sharp boundary. This point will govern the whole of chapter 10.

When a datum is not read, it may be so for three distinct reasons — the **three paths**, three ways of not actualizing —, and distinguishing them is crucial, for they do not call for the same answer. **Incapacity**: the reader *cannot* read, for want of code, of means, of access. The datum is mute for them, perhaps alive for another. This path calls for a means — learning, or having recourse to a referent who reads for one; it is remediable. **Disinterest**: the reader *could* read — they have the code, the means, the access — but does not; over-throughput turns them away; the datum passes before them; they see it without reading it. This path calls not for a means but for a relation: the attention one grants or refuses, the probity of whoever decides that this is worth reading and that that can pass. **Rapid lapse**, finally: the datum did not *wait* to be read; its freshness was so brief that, past the first instant, its utility is almost nil, and it passes into lapse before the question of reading it even arises. This path calls for no answer from the reader: it is a fact of the datum, not a failing of whoever did not read it. **Not all unread data are failures**. Rapid lapse is the normal fate of a large share of data; confusing it with a failing would be an error of diagnosis heavy with practical consequences.

Two neighbouring states must be held here without confusing them, for practice will meet them constantly. The **mute datum** is relative and reversible: mute for this reader here, for want of means, it remains legible for another, or for the same reader later. The one they could read and let pass, for want of attention, is not mute but neglected. The **dead datum** is the limit case where no reader any longer, anywhere, can interpret it: the interpretation is no longer only hidden in another; it is universally lost. Only the inscription on the medium remains. The dead datum joins disappearance — the second death of the first tome — not through a failure of the medium, which may subsist intact, but through the universal loss of interpretation. Mute: one can still come back to it. Dead: only a trace remains.

Faced with over-throughput, the reader is not helpless, but no route saves them entirely. The third tome names **three postures**, each with its cost. **Framing**: moving or narrowing one’s window, choosing deliberately what one looks at and what one lets pass. **Delegating**: inheriting the situation

of another reader, or the position of handling or processing that a machine occupies, which reads or processes in our place, accepting that one then inherits its window and its bounds. **Accepting**: consenting with lucidity to being swept along, for the part one can neither frame nor delegate without remainder. These three postures are not exclusive; they combine, and their combination engages the **probity of the reader** — the minimal ethics of whoever knows what they read, what they do not read, and what they delegate of their reading.

The Three Phases Held Together

One can now condense the essential into one sentence per phase. The datum is **made** by an act that inscribes it and fixes it — on its observational route, a drawing from the real — and from then on it ages (Tome 1). It **circulates** through an act that sets it in movement — and this movement multiplies its carriers, shares it like a fact on as many media as one wants, without dispossessing whoever transmits it (Tome 2). It is **received** through an act that reads it — and without this reading it remains, constituted but not actualized (Tome 3). Three acts, three phases, a single datum.

This tripartition is not a convenient classification: it is the structure of the whole book. Each chapter that follows works one or more of these phases through in a concrete field. The historical atlas will test the three phases on pre-digital apparatuses. The sectoral studies will go through the three phases, sector by sector, in one and the same grid. The toolbox will propose, for each phase, objects that can be handled. The political dimension will unfold above all on the second phase, circulation, where the questions of sharing, ownership and the commons lodge. And the chapter on the LLM will stand at the junction of the first and third phases — a systemic leap in making that is replayed in reception.

The next chapter takes this structure and makes it a grid of reading that can be handled: a small number of questions, applicable to any datum encountered, that take the reader from the three abstract phases to a reflex of examination.

Chapter 2 — Reading the Datum as a Flow: General Grid across the Three Phases

From the Concept to the Reflex

The previous chapter recalled the grid. This one makes it handleable. For knowing the concepts is not enough: faced with a figure, a table, an indicator, a graph, one must be able to *react* — ask oneself, quickly and in the right order, the questions that count. The object of this chapter is to

build this reflex: a general grid, valid for any datum encountered, that goes through the three phases without forgetting anything essential.

This grid is not a norm. It does not say what to conclude; it says what to *question*. It is a trigger of questioning, faithful to the principle of tooling of the book: a tool opens a question; a rule dispenses with thinking. Two practitioners applying this grid to the same datum will not necessarily reach the same judgement — and that is normal, for each use has its own optimum and each reader their own window. What they will have in common is not having omitted a decisive question.

The grid is organized into three families of questions, one per phase. One can go through it in full for a thorough examination, or activate only one family according to what is at stake. But the order has a meaning: one cannot question the reception of a datum well without first having situated its making and its circulation.

First Family — Questioning Making

These questions reconstitute the canal. Faced with a datum, they ask: where does it come from, who dug it, and according to what choices?

The first thing to reconstitute is the **flow of the real** from which the datum is taken. What fragment of the world is it? A population, a market, the air of a city, the body of a patient? This question seems trivial; it is not. Confusing the datum with the real it describes is the first shoal that the whole trilogy works to dispel. A datum is never the real; when it comes from observation, it is a drawing made from it, according to criteria; instituted or derived, it proceeds from an act under a rule or from a calculation on other data.

Next comes the **flow of observation**: who dug this canal, and with what intention? Every datum carries the mark of whoever constituted it and of the aim they pursued. Intention is not a defect to be corrected — it is constitutive of the flow of observation, which does not exist without criteria, and no criteria without an aim. The question is therefore not “is this datum neutral?” (none is) but “what intention presided over its making, and is this intention compatible with my use?”.

One then questions the **criteria**: the cadence of drawing, its scope, the instrument used, the implicit units and norms. An unexamined criterion is a possible bias. And one adds the question of the **undrawn**: what was *not* captured, and could be relevant? The undrawn is often more instructive than the drawn, for it reveals the blind spots of the upstream intention. Where no instrument was placed, nothing will ever be seen — and one will wrongly conclude that there was nothing to see.

Two questions of making concern, finally, time and the loop. The **functional age**: when did the drawing take place, and is the datum still valid for the intended use, given the speed at which its real changes? A datum does not display its lapse; nothing on its surface says how long ago

the real left it. And the **loop**: does this flow of observation modify what it observes? A score that changes the behaviour it measures, a measurement that triggers an action that alters what is measured — so many loops whose ignorance distorts interpretation.

Second Family — Questioning Circulation

A datum encountered has almost always travelled before reaching us. These questions go back over this journey.

The master question is that of the **chain**. Can one follow transport back to the source? Between the initial drawing and the datum I have before my eyes, how many hands, copies, reprocessings? The second tome showed that transport can alter fidelity; each link is a point where the datum may have been truncated, cropped, badly copied. A datum whose chain cannot be followed back to the source is a datum of which one does not know what it underwent on the way.

One then questions the **temporality of transport**: how long did the datum take to arrive, and how much did it age during this trip? A datum fresh at the source may be stale on arrival, if transport was slow with regard to the speed of its real. And one does not forget **multiplication**: was this datum shared like a fact — duplicated identically in multiple places — or does one hold the only copy? The answer changes the way of reasoning about its reliability, its ownership, its diffusion: one does not secure a shared fact as one guards a unique object.

One particular question deserves to be asked separately: does the datum belong to a **stable source**? If its real flows slowly, it can seem motionless and reliable for a long time. But this stability is a ratio of speeds, never an acquired property: one must check that the real observed has not, since the drawing, changed its rhythm. A source stable for a long time can cease to be so when its real races.

Third Family — Questioning Reception

The previous questions concerned the datum. These concern the reader — that is, most often, ourselves. They are the easiest to forget, because one readily questions what one reads, rarely the conditions in which one reads it.

The first is that of the **window**. Do I have the means and the time to really read this datum, or is it going to submerge me? A datum one does not have the capacity to examine — for want of a code to decipher it, for want of attention available in the throughput — is not read, whatever one believes. Recognizing this makes it possible to choose a posture rather than undergo: **framing** (narrowing what one examines in order to read it well), **delegating** (relying on a capable reader, taking on the fact that one inherits their window), or **accepting** (consenting with lucidity to not

being able to read everything). The worst option is the fourth, unwritten one: believing one has read what one has merely seen pass.

The second question diagnoses, if the datum is not read, *why* it is not — according to the three paths. Is it **incapacity** (I lack the code, the means, the access — a remediable path, which calls for learning or for recourse to a referent)? **Disinterest** (I could, but the throughput turns me away — a path that calls not for a means but for a decision of attention)? Or **rapid lapse** (the datum did not wait; its freshness was too brief — a path that calls for no answer, for there is no failing there)? This diagnosis avoids the most costly error in practice: treating as a failure a datum that was not meant to be read, or conversely letting pass as normal a non-reading that was, for its part, a real failing.

The last question is that of **probity**. For my precise use, is this datum suited — or unsuited? And if I am about to transmit it in my turn, or to found a decision on it, am I able to answer for what I have understood of it? The probity of the reader is not a decorative virtue: it is the condition for the actualization of the datum, which takes place only in reading, to happen in awareness rather than blindly.

The Grid at a Glance

The eleven questions can be summed up, grouped by phase. They are not read as a procedure to be run through mechanically, but as an aide-memoire to draw on according to what is at stake.

Making (Tome 1)

1. From what flow of the real is this datum taken — or from what act, from what data? (*do not confuse the datum and the real*)
2. Who dug this flow of observation, with what intention?
3. What are the criteria — cadence, scope, instrument, units, implicit norms?
4. What was not drawn, and could be relevant?
5. What is the functional age of the datum, given the speed of its real?
6. Is the flow in a loop — does it modify what it observes?

Circulation (Tome 2)

7. Can the chain be followed back to the source — what may the datum have undergone on the way?
8. How long did transport take, and how much did the datum age during this trip?
9. Has the datum been duplicated, shared like a fact — or does one hold the only copy?
10. Does it belong to a stable source — and does this ratio of speeds still hold?

Reception (Tome 3)

11. Do I have the means and the time to read it — and, if not, is it incapacity, disinterest or rapid lapse? For my use, is it suited, and can I answer for what I understand of it?

This eleventh entry condenses several questions because, in practice, they arise in a single movement: recognizing one's window, diagnosing any non-reading, judging suitability to the use and engaging one's probity are the faces of one and the same gesture — the one by which a situated reader takes responsibility for what they read.

What the Grid Has Taught, and Its Limits

In applying it, one will have noticed that the three families do not weigh equally according to context. A scientific reference datum calls above all for the questions of making; a datum that has passed through many intermediaries calls first for those of circulation; a continuous flow of information, which submerges us, calls above all for those of reception. The grid is complete, but its use is selective: competence consists in knowing, faced with each datum, which family to call on first.

One limit must be named at once, for it governs the whole use of the grid. The grid helps to *ask* the right questions; it provides none of the answers. It does not say what functional age is acceptable, nor what upstream intention is legitimate, nor what posture to adopt in the face of over-throughput. These answers depend on context, on use, on the reader — and that is exactly why the book that follows works the grid through field by field rather than claiming to resolve it once and for all. The concept lights up the area where one must look; it does not make the chart of the reefs. The general grid is this lamp. The following chapters teach how to use it, where one really navigates.

End of Part I. The following parts work through the grid: the historical atlas (Part II), the sectoral studies (Part III), the LLM (Part IV), the toolbox (Part V), the economic and political forms (Part VI), and the methodological closing.

Part II — Historical Cases

Atlas of historical illustrations of processual ontology

Text written in May 2026. The cases treated are historical and do not go stale; the scholarly studies that shed light on them, on the other hand, evolve, and the conceptual comparisons proposed here remain of the order of revisable illustration.

Chapter 3 — Atlas of Historical Illustrations

Why Go Back Before the Digital

The digital moment has a weakness: it believes itself to have no lineage. Its tools present themselves as unprecedented, its challenges as unheard-of, its datum as a recent invention. This is an illusion, and it has a practical cost — it prevents one from seeing that today’s difficulties are, for the most part, old difficulties simply made massive again. Whoever believes their problem unprecedented solves it less well than whoever knows that it has been met before.

The historical cases gathered here function as **pure conceptual laboratories**. Without the technological seduction of the present — without sensors, without databases, without models —, the structure of the phenomenon appears bare. A parish priest who keeps his register of baptisms, a Babylonian astronomer who notes the position of a planet, a naturalist who fills a notebook: all build flows of observation, make choices of criteria, face lapse and transport. The concepts of the trilogy are at work in them, freed from the technical varnish that, in contemporary cases, often hides how they function.

These cases illustrate; they do not demonstrate. In keeping with the stance of the book, they are of the order of form: revisable, contingent, chosen for their teaching value. Only the concept is binding. And one caution is needed, which holds for the whole chapter: speaking of a “flow of observation” about the Babylonians, of “transport” about a portolan chart, of a “situated reader” about a parish register, is applying a modern grid

to apparatuses that did not think of themselves in this way. One does so deliberately, to reveal a structure — but knowing that one is projecting a grid, and that this grid does not exhaust what these apparatuses were for those who kept them.

A Uniform Grid of Treatment

Each case is examined according to an eight-point grid, so that comparison from one case to another remains possible. The first seven points belong above all to making; the eighth, activated only when the case lends itself to it, opens onto circulation and reception.

1. The apparatus, in fact: who, where, when, how.
2. The flow of observation built.
3. The criteria, and the intention that chose them.
4. Probity, cadence, the corpus.
5. Lapse and the two times, for long cases.
6. The social and political consequences of committing to memory.
7. A perspective specific to the case.
8. (*optional*) Circulation and reception: how the datum travelled, who read it, what it became for want of reading.

Eight cases are treated here, from the oldest to the most recent, with the eighth point activated for the four that call for it most clearly.

Case 1 — The Babylonian Astronomical Diaries

From the eighth to the first century before the common era, Mesopotamian observers kept, on clay tablets, a systematic survey of celestial phenomena: positions of the planets, eclipses, meteors, but also the level of the Euphrates, the prices of commodities, notable events. These *astronomical diaries* constitute the longest systematic flow of observation known from Antiquity — more than six centuries of continuity.

The **flow of observation** is exemplary in its continuity: a daily cadence, kept up by successive generations of observers, according to remarkably stable criteria. This stability came from the nature of the object. The sky is the typical case of the **stable sources** of the second tome: its real flows, but so slowly that at the human scale it seems motionless. A Babylonian astronomer could compare a planetary position with the one measured centuries earlier and treat them as commensurable — not because the sky did not change, but because it changed infinitely more slowly than the needs of prediction. One “navigates in place” over six centuries when the real observed is so slow.

The **criteria** were chosen with a precise intention: forecasting, for divinatory and calendrical purposes. One did not note everything in the sky; one noted what served to foretell and to regulate the calendar. The **undrawn** is instructive here: celestial phenomena without value as omens

did not enter the flow, not through blindness but through the absence of any intention to capture them.

Lapse did not threaten the individual datum — a position measured remained right forever in the time of inscription — but its value changed in nature over time. Fresh, it served prediction; old, it became the material of a centuries-long corpus whose value was no longer that of omens but cumulative. The Babylonian datum thus illustrates the distinction between the two times: eternal in the time of inscription, it changed use as the time of the real moved away, without ever becoming false.

Social consequence: this flow sustained a caste of specialists and a scribal institution, and its very long duration made possible the discovery of regularities — planetary periods, eclipse cycles — that no short observation would have allowed one to establish. The length of the corpus was not a by-product; it was the condition of the knowledge derived from it.

Case 2 — Parish Registers

From the Middle Ages to the French Revolution, parish priests kept a register of the baptisms, marriages and burials of their parish. This demographic flow of observation, institutional and decentralized, ended up covering entire territories over centuries.

The **flow of observation** is here socially situated down to its definition. Baptism marks the entry into the flow; burial, the exit. But these thresholds are religious conventions, not raw biological facts: the entry is not birth, it is baptism. Hence an **undrawn** heavy with meaning — newborns who died before baptism, people on the margins outside the parish, fugitives, non-Christians. What the register does not capture is not a technical omission: it is the exact negative of the intention that instituted it. Reading a parish register without seeing its undrawn is taking the baptized population for the real population.

The **inter-flow dynamics** are remarkable: parish registers cross-check with seigneurial, fiscal and notarial registers. Crossing these flows makes it possible to reconstitute what none gives alone — this is a propagation in the sense of the second tome, where distinct flows feed one another.

The eighth point is required here, for the fate of these registers illustrates the **constituted but not actualized datum** of the third tome. Kept at first for a living use — administrative, pastoral —, they underwent, as their real moved away, a **gentle lapse**: past the immediate use, they ceased to be read as current data. They did not die for all that. They became a historical corpus, reread centuries later by demographers and by the historians of the Annales school. This is a case of a **lapsed datum**, not of a mute datum nor of a dead datum: stale for current use, the register remained legible, and valid as a historical source for another reader, situated otherwise. The immediate non-reading was not a failure — it came from a lapse of use —, and the late rereading actualized it again, for another use. Not a trace

that was waiting: a datum that remained constituted, which a reader of another time actualized.

Case 3 — The Field Notebooks of Naturalists

In the eighteenth and nineteenth centuries, travelling naturalists — Humboldt crossing equinoctial America, Darwin on board the *Beagle* — kept field notebooks that are the paradigmatic case of the **idiosyncratic flow of observation**: one person, one notebook, criteria that evolve as experience accumulates.

Unlike the institutional flow of the registers or of the Babylonian diaries, the naturalist's notebook has no criteria fixed in advance by an institution. They form along the way. What seemed worth noting at the start of the journey no longer is at the end; the observer learns what must be observed by observing. The flow of observation is therefore built at the same time as the intention that guides it is built — a fine illustration of the idea that criteria and aim are inseparable, and that they can form jointly.

The question of **probity** is central and delicate here. A field notebook is a flow of observation that is hard to verify: the observer is often the only witness. Its value depends on the trust granted to their rigour — to their probity as annotator. The **referential neighbourhood** plays a large role here: a notebook is worth all the more as it interconnects with others, as it can be cross-checked, compared, situated in a network of concordant observations. Naturalist science was built on this interconnection of idiosyncratic flows.

Major consequence: these notebooks, long held to be private working media, have become monuments — reread, edited, scrutinized for what they reveal of the formation of a thought. Darwin's notebook is no longer read today for its zoological observations, largely superseded, but as a testimony to the elaboration of a theory. Here again, a change of reader has actualized again, for another use, notebooks that the lapse of the observations themselves had caused to stop being read.

Case 4 — The Roman Censuses

Under the Republic and then the Empire, Rome kept a periodic census — the *census* — for fiscal and military purposes: counting the citizens, assessing their property, founding taxation and conscription. Its cadence was multi-year, organized around the *lustrum* that separated two operations.

The Roman census is the classic case of the **loop**. The count determines taxation; taxation modifies the declarative behaviour of those counted, who have an interest in understating what they declare; and this understatement in turn alters the flow of observation. Observation transforms what it observes, because the observed know they are observed and that

observation has consequences for them. Every datum drawn under the eye of a stake — fiscal, here — carries the mark of this stake.

The multi-year cadence illustrates an arbitration of the **observational optimum** dictated by cost. Taking the census of an empire was expensive; it could not be done continuously. The interval between two *lustra* was the price of a compromise between desirable freshness and tolerable cost. Between two censuses, the datum aged — citizens were born, died, grew richer, grew poorer, without the flow following them. The optimum was not maximum freshness, economically out of reach, but the best compromise available.

Case 5 — Portolan Charts

From the thirteenth to the sixteenth century, Mediterranean sailors had charts — the portolans — of remarkable coastal precision, built not by a single authority but by the progressive accumulation of navigators' surveys. The portolan is the paradigmatic case of the **consolidated datum** through propagation, and the eighth point is central to it.

A portolan chart synthesizes dozens of individual flows of observation: each sailor who sailed along a coast, measured a distance, noted a heading, contributed a fragment. The chart is the datum of no particular observer; it is the consolidation of all of them. This is a **propagation** in the sense of the second tome: elementary flows aggregate into a flow of a higher level, more reliable than each of its contributors.

The portolan illustrates above all **multiplication** — this property of transport that shares the datum like a fact without dispossessing anyone of it. When a port improved its chart, the copy could spread to other ports without the first losing anything. Cartographic knowledge propagated by duplication, not by cession: each copy was as good as the original, and each port could at once receive and go on enriching — the corrected chart becoming a descendant of the one it had received. These **inter-entity dynamics** — each port improves the chart that the others use — are exactly what the second tome describes when it says that one does not transport a datum like an object, but shares it like a fact. The portolan shows that this property, which one believes specific to digital technology, is as old as the manuscript copy.

Case 6 — The Tables of the Accademia del Cimento

In the seventeenth century, the Florentine Accademia del Cimento produced one of the first systematic flows of thermometric observation, measuring temperatures with calibrated instruments. This case illustrates the **emergence of a systemic leap**.

Before the thermometer, one spoke of hot and cold in qualitative and relative terms: it is hotter than yesterday, the water is lukewarm. After it, one measures: the water is at so many degrees. This passage is not

a refinement of the same gesture — it is a change of regime. It brings forth a type of datum that did not exist, and it requires a new condition: **calibration**. For two entries to be comparable, the instruments must be calibrated against a shared reference. The Cimento stumbled on this requirement: without a universal scale, its entries remained hard to make commensurable with one another and with those from elsewhere.

The systemic leap of the thermometer thus shows that a new regime of making the datum never comes down to an instrument: it calls for the **invention of a common reference**, without which the data produced do not circulate — for want of being legible outside the place that produced them. The uncalibrated datum is mute for the distant reader: they perceive it, they distinguish it, but they cannot decipher it, for want of the shared code that the scale is. The leap in making is completed only with an agreement on reception.

Case 7 — The *Encyclopédie* of Diderot and d’Alembert

Between 1751 and 1772, the *Encyclopédie* constituted a vast organized corpus of knowledge: a system of classification, cross-references, distinct roles. This case is retained for a precise reason — it offers the historical anchor of the grid that will serve in chapter 10 on the LLM, and the eighth point is decisive in it.

The *Encyclopédie* implements a **structured consolidated datum** in the classical sense, with three roles still clearly separated. There are those who produce knowledge — the authors of articles. There are those who organize it and make it findable — the apparatus of classification, the cross-references, the overall architecture. And there are those who render and transmit it — the book itself as mediator between knowledge and the reader. Producer, organizer, renderer: three distinct functions, held by different instances, and this very distinction is what allows the reader to go back from an article to its source, to contest a classification, to judge a contributor.

It is exactly this separation that chapter 10 will see disappear in the systemic leap of the LLM, where the three functions merge into a single instance. The *Encyclopédie* is thus the historical term of comparison that makes legible what the contemporary fusion removes: not knowledge itself, but the separation of roles that guaranteed control over it. One will better measure what the LLM transforms by having first seen it function, separated, two and a half centuries earlier.

Case 8 — The Railway Timetable and the Telegraph

In the nineteenth century, the railway posed a problem of coordination without precedent: running numerous, heavy and fast trains on finite tracks — often single ones — that no one could any longer keep in sight. Two apparatuses answered it: the timetable, a printed datum that fixes

the future of train movements, then the telegraph, which for the first time made the datum travel faster than the real it describes. This is, half a century before the word took on its modern sense, coordination by the datum — and the eighth point of the grid is central to it.

The real to be observed presented a radical novelty: it was **faster than any existing messenger**. Until the railway, a piece of information travelled at best at the speed of a horse or a ship — that is, at the speed of the things it described, or hardly more. The train outdistanced every carrier: the datum about the train could travel only *in* the train. The position of a train, a datum whose **freshness** is counted in minutes, was therefore structurally stale for any distant reader. The nascent sector faced a flow of the real that the existing regimes of transport could no longer follow.

The first answer was the **timetable** — of which Bradshaw's guide, compiling from 1839 the tables of the British companies, became the emblem. The timetable is a datum of a singular kind, **institutional** rather than observational: it does not describe the real, it prescribes it. For want of being able to observe the trains on their way, one reverses the relation — one fixes their movements in advance, and the real is required to conform to the datum. This is the **loop** carried to its height: the inscription no longer reflects the observed, it commands it. The apparatus has a symmetrical greatness and weakness. Its greatness: it coordinates without observing, by the sole authority of a shared datum. Its weakness: it knows nothing of gaps. Let a train fall behind, and the whole system goes blind — the timetable goes on describing a real that no longer exists, and the collisions of the time-interval era paid the price of this blindness.

The **telegraph** then performs a **systemic leap**, and it is no trifle that it was born along the tracks — the first commercial lines of Cooke and Wheatstone, at the end of the 1830s, ran alongside the Great Western Railway. For the first time in history, the datum moves faster than the thing: **transport** — this relation between two movements that the second tome set out — comes apart from physical movement, and a train's position can reach its reader *before* it goes stale. The whole regime of coordination is changed by it: telegraphic block working makes the occupation of a section of track a datum with a brief validity window, transmitted and read in the very time of its freshness; the control of train movements by telegraphic orders, developed in the 1850s, makes it possible to take back control when the real departs from the timetable. The prescribed datum and the observed datum now work together — the one fixes the plan, the other closes the gap.

As at the Cimento, the leap was completed only with a **common reference** — and it was necessary, here, to calibrate time itself. Timetables that each town read in its local solar time were incommensurable with one another; the British companies adopted from the 1840s a single time, known as railway time, and it was the pressure of the railway that imposed time zones on the North American continent in 1883. Standard time was not born of an astronomical need but of a need of circulation: for data of movement to be combined, all readers had to share the code that makes

them decipherable.

Circulation and reception, finally, give the case its most lasting lesson. The reader of this system — the signalman, the dispatcher — has a narrow window and counted time, and reads data whose lapse is almost immediate: a telegram read too late no longer describes the present of the network, and the stale datum is worse there than the absence of a datum, for it authorizes with assurance a real that has vanished. The probity of this reader — dating what they transmit, holding as valid only what is fresh — was, very early, a matter of human lives. Chapter 8 will find this structure intact in today's physical transportation: the sector where coordination by the datum took its modern form is also the one where freshness has never ceased to be the first criterion.

What the Atlas Has Shown

Eight apparatuses, from Babylonian clay to the nineteenth-century railway, and the same grid runs through them all. None had a sensor, a database, a model; all constituted data — by observation most often, sometimes by an act that institutes or by compilation —, made choices of criteria, faced lapse, transport and reading. The concepts of the trilogy were not born with digital technology: digital technology made them massive again, accelerated them, sometimes reconfigured them by systemic leap — but their structure was there, legible, as soon as a human being dug a canal in the river.

A limit, to finish, which is also a warning of method. These cases shed light; they dictate nothing. One cannot conclude from a parish register to a rule for contemporary databases, nor from a portolan to a policy of sharing. What the atlas offers is the recognition of a common structure under very distant forms — and therefore the assurance that present difficulties are not without precedent. That is a great deal, for whoever must decide today. It is not a chart of the reefs: it is the proof that others, before us, sailed the same waters.

End of Part II.

Part III — Sectoral Case Studies

Text written in May 2026. Sectors evolve and so do techniques; the overviews of the current state below carry their date and point out their zones of rapid lapse. The grid that organizes them, for its part, is stable.

Preliminary Note — The Standard Structure of the Sectoral Studies

Each sector is treated according to one and the same grid in eight sections, which follows the order of the three phases of the datum. This uniformity is deliberate: it makes it possible to compare two sectors by going through the same sections in each.

1. **The sector in brief.**
2. **The flow of the real observed** (*making*).
3. **The flows of observation kept up** (*making*).
4. **The observational optimum and the perils of making** (*making*).
5. **The circulation of the sector's data** (*circulation*).
6. **Reception: who reads, who does not read, what remains not actualized** (*reception*). This section refers to chapter 10 for the case of the LLM, without duplicating it.
7. **The political questions specific to the sector** — bridge towards Part VI.
8. **Leads for the data artisan (a craft yet to be created) in this sector.**

Six sectors are treated, chosen to cover the three phases and a diversity of stakes: air quality (clear optimum, teaching case), health (strong probity, ethics), security and justice (structural biases, loops, institutional unread), climate (long term, stable sources), physical transportation (rapid lapse, route loops, coordination of heterogeneous actors), and education (a case where reception is the central stake).

Chapter 4 — Urban Air Quality

The sector in brief. Air quality monitoring mobilizes networks of urban sensors, public agencies and, more and more, citizen apparatuses. The stake is one of health and of politics: informing, alerting, triggering restriction measures. It is a good way in, for the observational optimum is almost tangible there.

The flow of the real observed. The real is here the chemical composition of the air: nitrogen dioxide, fine particles, ozone, volatile organic compounds. This real has very varied speeds of its own: the concentration of particles can change within an hour, under the effect of traffic or wind, whereas seasonal averages evolve slowly. The sector therefore faces several time scales at once.

The flows of observation kept up. Reference measuring stations, few and costly, supply reliable and calibrated data. Micro-sensors, cheap and easy to multiply, supply a dense mesh but a less faithful one. Two flows of observation therefore coexist, built with distinct intentions: one aims at regulatory fidelity, the other at spatial coverage. Confusing them would be an error — their criteria differ.

The observational optimum and the perils of making. The arbitration is explicit: density of the mesh against cost of instrumentation against fidelity. Over-instrumenting with cheap sensors gives a dense but noisy map; under-instrumenting with reference stations gives a faithful map full of holes. The specific peril is **calibration drift**: a sensor that is not recalibrated produces data that silently move away from the real. Another peril, a characteristic **loop**: a measured peak triggers a traffic restriction, which modifies the real observed — observation acts on what it observes.

The circulation of the sector's data. Measurements circulate towards public platforms, aggregated indices, applications. **Propagation** is strong here: a station feeds regional and national indices, forecasting models. The risk in circulation lies in the loss of context: an aggregated index, transported far from its source, loses the record of the criteria that produced it. The user of an application that displays “good air quality” most often does not know which flow, at what fidelity, with what age, produced this verdict. For them, the chain cannot be followed back.

Reception. The final reader — a resident, a person with asthma, a parent — has a narrow window: they want a simple verdict, not a series of measurements. Reception is therefore almost always **delegated** to an index that summarizes. This delegation is legitimate, but it has a cost: the user inherits the window of whoever built the index, without knowing it. Many fine-grained data pass into **rapid lapse** without having been actualized — for the alert, a peak from three days ago no longer interests anyone — and this is the normal fate of these data, not a failure. The use of automatic forecasting models belongs to chapter 10.

The political questions specific to the sector. Who finances the mesh?

Who validates citizen sensors? Is access to the data public? Air quality is a typical case of a datum of common interest, where the political dimension (Part VI) arises clearly: a commons of environmental measurement.

Leads for the data artisan. In this sector, the artisan watches over calibration, knows how to distinguish the two flows (reference and mesh) and aggregates them only with full knowledge of the facts, and documents the age and fidelity of any index they transmit. Their probity lies in never letting a simple verdict hide the chain that produced it.

Chapter 5 — Hospital Health

The sector in brief. The hospital produces and consumes intense flows of observation on the bodies of patients: vital signs, examinations, medical history, clinical observations. The stake is vital in the literal sense, and the requirement of probity is at its maximum there.

The flow of the real observed. The real is the state of the patient, which has extremely varied speeds of its own: a heart rate changes in seconds, a laboratory work-up in hours, a past medical history is almost stable. One and the same patient is therefore the object of flows of observation with heterogeneous cadences.

The flows of observation kept up. Continuous monitoring in intensive care, one-off examinations, the medical history file, nursing and medical observations: so many distinct flows, kept up by different actors, with different intentions. The optimum is not the same from one department to another: intensive care requires a cadence and a density that outpatient consultation would not justify.

The observational optimum and the perils of making. The arbitration sets the fineness of monitoring against the cost — human, material, and to the patient's comfort. Over-monitoring tires the patient and drowns the caregiver under alerts. Under-monitoring lets deteriorations pass. The major peril is the **decision loop** of alert scores: a score that triggers an intervention modifies the state it was measuring. Another peril, the **undrawn**: what is not in the monitoring protocol is not seen, and one can wrongly conclude to the absence of what one did not look for.

The circulation of the sector's data. Inter-hospital sharing is a high-stakes **propagation**: a file that follows the patient from one establishment to another improves care, but each transport is a point of loss of fidelity and context. **Confidentiality** acts here as a **deliberate impediment of transport**: one voluntarily restricts circulation to protect the patient. It is a chosen limitation, which has a cost (the datum not shared may be missing where it would be useful) and a justification (the reader's share must remain impracticable for an undue reader). The sector shows that

not every transport is desirable, and that impediment can be an act of probity.

Reception. The reader is the caregiver, whose window is saturated. Clinical over-throughput is real: too many alerts kill the alert. The caregiver must permanently **frame** (decide what they monitor), **delegate** (to scores, to colleagues) and **accept** that they cannot read everything. The probity of the reader is here a question of life or death: answering for what one has read, and for what one has delegated, engages clinical responsibility. The use of automatic diagnostic-support models belongs to chapter 10.

The political questions specific to the sector. Ownership of the file, consent to sharing, medical confidentiality, research access to care data: health is a dense field of tensions between the utility of the flow and the protection of the person. Part VI comes back to it.

Leads for the data artisan. In care, the artisan holds probity as the first requirement: they know which flow they read, at what freshness, and they document what they transmit. They treat confidentiality not as an external constraint but as a criterion of making in its own right. And they are wary of loops, distinguishing what the score measures from what the score provokes.

Chapter 6 — Security and Justice

This chapter deals with politically charged ground. It keeps to the processual grid and refrains from taking any partisan position: it maps a structure, it does not plead.

The sector in brief. Police, justice and public security produce and exploit flows of observation on crime, offences, persons. The stake is heavy: these flows guide decisions that affect liberty.

The flow of the real observed. The real would be real criminality — the set of offences committed. But this real is, by nature, partly hidden: many offences are never reported. The sector faces from the outset a structural gap between the real and what can be drawn from it.

The flows of observation kept up. Police statistics measure *ascertained* offences, not *committed* offences. This is the paradigmatic case of **structural drawing bias**: one draws where one has already deployed means. Patrolling a neighbourhood leads to more offences being ascertained there, which justifies patrolling it more. The flow of observation measures in part the intensity of its own activity, not only the real it claims to describe.

The observational optimum and the perils of making. The dominant peril is the **loop**, particularly vicious here: predictive policing. A model that predicts crime where it has been ascertained sends means

there, which ascertain more of it there, which confirms the model. The loop closes on itself and takes itself for a truth. The **undrawn** is political here: domestic violence, long under-reported and under-drawn, or cyber-crime, poorly captured by apparatuses designed for street crime, are massively absent from the flows — not because they are rare, but because the instruments were not turned towards them.

The circulation of the sector's data. Statistics circulate towards public debate, political decisions, the allocation of means. **Propagation** is high-risk here: a figure of ascertained criminality, transported far from its source and its criteria, is read as a figure of real criminality. The loss of context in circulation transforms a measure of activity into a verdict on the world.

Reception. The institutional reader — decision-maker, elected official, citizen — reads these figures through a window that does not always distinguish the ascertained from the committed. This is a remarkable case of the **structural unread** in the sense of the third tome: certain realities (domestic violence yesterday, cybercrime today) are not read because the institutional reader's window does not distinguish them — disinterest that is not individual but organized by the form of the instruments. Recognizing this unread is already beginning to correct it. The use of predictive models belongs to chapter 10, where the situated position of handling or processing that they occupy is central.

The political questions specific to the sector. Transparency of public algorithms, the right to contest an automated decision, citizen audit of models: this sector is the most exposed of all to the questions of Part VI. Editorial caution is in order — one describes the structure of the bias, one does not name a culprit.

Leads for the data artisan. In this sector, the artisan systematically distinguishes ascertained criminality from real criminality, tracks down prediction loops, and names the undrawn as a datum in its own right. Their probity consists in refusing that a measure of activity be read as a verdict on the world.

Chapter 7 — Climate and Environment

The sector in brief. Climate science rests on flows of observation of very long duration and on reconstructions of the past. The stake is planetary, and the political dimension of the datum is explicit there.

The flow of the real observed. The real is the climate system, whose speeds of its own range from the daily meteorological event to centuries-long cycles. The climate datum is the typical case of long-run **stable sources**: mean temperatures, sea levels, atmospheric composition evolve

slowly at the human scale — but this ratio of speeds degrades as the real races, which is precisely the object of the sector's concern.

The flows of observation kept up. Networks of stations, satellites, buoys, long instrumental series. And, for the pre-instrumental past, **proxy reconstructions**: tree rings, ice cores, sediments. These proxies are a particularly interesting case with regard to the trilogy — they are **replayed data**, constituted today on traces of the past real by a retrospective drawing. The ice was not drawn as a datum when it formed; it became a datum when an observer, much later, knew how to draw it and inscribe its measurements — by an act of inscription, not by an act of reading. The temperature reconstructed from it is, for its part, a derived datum: estimated by a model from these measurements.

The observational optimum and the perils of making. The arbitration sets the spatio-temporal density of the network against the considerable cost of long-running apparatuses. The specific peril is the **heterogeneity of series**: joining instrumental series produced by different apparatuses over a century requires careful calibration, failing which one takes a break in instruments for a climate signal. The historical **undrawn** — poorly covered regions and periods — weighs on reconstruction.

The circulation of the sector's data. The climate datum circulates widely and feeds **models**, whose outputs are second-order derived data. The question of circulation is here also a question of access: who can consult, verify, recalculate? The fidelity of transport is crucial, for a climate datum badly copied or taken out of context feeds contestation. Traceability back to the source is here a stake of scientific as much as technical credibility.

Reception. Climate over-throughput is massive: no human reader reads the entirety of the series and models. **Delegation** to models and syntheses is inevitable and legitimate, provided it is acknowledged. The public reader, for their part, receives very framed syntheses, whose window they inherit. A share of the raw datum remains not actualized for want of reading — but constituted, preserved, archived, and therefore reopenable: a neglected datum rather than a dead one, intelligible for whoever takes the time to read it, and which another reader will be able to take up. The use of automatic models belongs to chapter 10.

The political questions specific to the sector. Who finances the long flows? Who validates them? To whom are they accessible? The climate datum is a worldwide scientific commons whose governance is a political stake of the first order. Part VI comes back to it.

Leads for the data artisan. For climate, the artisan takes care of the calibration of long series, documents proxy reconstructions as replayed data and not as direct measurements, and holds traceability back to the source as a requirement of credibility. Their probity consists in distinguishing the measurement from the model, and the replayed from the drawn.

Chapter 8 — Physical Transportation and Mobility

*Throughout the trilogy, “transport” designates the movement of the datum. This chapter deals with the movement of goods and persons, which it designates only by the full name **physical transportation**, or **mobility**. When the word “transport” appears alone, it is in the sense of the second tome.*

The sector in brief. The movement of goods and persons — freight, logistics, public transportation, road — is one of the oldest grounds of coordination by the datum: even before the word was in use, the railway timetable and the telegraph coordinated movements that no one could any longer keep in sight (the atlas of chapter 3 deals with this in case 8). The sector was a forerunner out of necessity: running numerous vehicles on finite infrastructures requires knowing, at every instant, where things are and what awaits them — the optimum of its functioning has, from the origin, been an optimum of coordination. The sector has two objects, which must be held together without confusing them: goods, which do not speak but are declared, and the person, who moves freely and whose position is captured.

The flow of the real observed. The real is here a mobile real: positions, speeds, loads, states of the infrastructure and of what circulates on it. Its speeds of its own are among the most contrasted of all sectors: the position of a vehicle changes in seconds, the state of traffic in minutes, an infrastructure in years. And the sector presents a particularity that the previous ones did not have to this degree: the observed moves while one observes it. The gap between the real and its drawing, constitutive of every datum of observation, widens there at the very speed of what one is following.

The flows of observation kept up. Four families of flows coexist, with distinct intentions. On-board flows: the instrumented vehicle draws on itself and on its environment — position, speed, state of charge. Infrastructure flows: counting loops, toll stations, sensors and cameras draw on what passes in front of them. Declarative flows: manifests, consignment notes, bookings, tickets — the contractual share of the sector, where the datum, instituted by the contract rather than observed, precedes the movement it announces. Platform flows, finally: the positions of telephones, captured for other ends and reused to estimate traffic. Each was designed for its own use — operating, invoicing, contracting, serving — and their aggregation inherits these divergent intentions.

The observational optimum and the perils of making. The arbitration sets the cadence of drawing against the cost of instrumentation and transmission: following each vehicle every second produces a throughput that no use justifies; following it every hour no longer serves traffic control. The

dominant peril is **rapid lapse** carried to its extreme: for traffic control, a position goes stale in seconds, a traffic estimate in minutes — the sector's datum is among the most perishable there are, and its normal fate is to pass into lapse almost as soon as it is produced, often without having been read, which is not a failure. The other peril is a characteristic **loop**: traffic information modifies traffic. The route recommended to everyone moves the congestion it claims to avoid; the published estimate acts on the real it was estimating. The **undrawn** has its own geography: non-instrumented modes — the pedestrian, the bicycle, informal freight, the last kilometre — are absent from the flows not because they are marginal, but because the instruments are not turned towards them.

The circulation of the sector's data. The mobility datum circulates between heterogeneous actors — transport operators, infrastructure managers, transport authorities, platforms — whose flows were not designed to fit together: interoperability is a permanent work there, made of conversions and semantic agreements, and each relay is a point of loss of fidelity and context. An average travel time, transported far from its source, no longer tells either its window of calculation or what it excluded. Above all, the sector is one of the rare ones where the transport ageing of the second tome remains perceptible despite instantaneity: the datum must reach a reader in movement before it goes stale, and the delay of the chain — drawing, consolidation, distribution — is measured against a validity counted in seconds. Finally, the position of a person is a datum about the person: restricting its circulation is, as in health, a deliberate impediment of transport — a chosen limitation, which protects.

Reception. Three readers with very unequal windows. The operator, at the traffic control post, has a saturated window: they **frame** (they choose what they monitor), **delegate** (to thresholds, alarms, syntheses) and **accept** that they will not read everything. The driver has the narrowest window of the corpus: mobile, occupied by driving itself — over-throughput there is a physical danger, for reading while moving is paid for in attention to the real. The traveller or the shipper, finally, wants only a verdict: an arrival time, a delivery status — a legitimate delegation, whose window they inherit without seeing it. A large share of the datum produced passes into rapid lapse without having been actualized, and that is its normal fate. As for on-board processing that acts without any human reading — driver assistance, automated driving —, it belongs to the background set out by the third tome: the machine occupies a situated position of handling or processing there, a delegated processing inserted into a chain whose imputability remains with the agents and the institutions that design this processing and employ its results. The use of models belongs to chapter 10.

The political questions specific to the sector. Mobility history is one of the most revealing there is: knowing where a person goes is knowing a great deal about them. Who holds these histories — private platforms, transport authorities, manufacturers? On what conditions do public au-

thorities access the flows of the platforms that in fact regulate their roads? The sovereignty of logistics flows — knowing what circulates on one's territory — joins the questions of Part VI.

Leads for the data artisan. In this sector, the artisan holds freshness as the first criterion: they date everything they transmit, and systematically distinguish the observed position from the estimated position, the predicted arrival from the ascertained arrival. They track down route loops — what the publication of an estimate does to the real estimated — and document what each aggregate has excluded. Their probity consists in never letting a prediction be read as an observation, nor an average hide the window that produced it.

Chapter 9 — Education and Learning

The sector in brief. Education produces flows of observation on pupils, and it is also the place where the capacity to read flows is formed — or is not. It is the sector where **reception** is the central stake, which makes it the necessary complement of the four previous ones.

The flow of the real observed. The real is learning: what happens in the head of a pupil, by nature not directly observable. One never draws learning; one draws indicators — answers, behaviours, attendance — from which one infers learning. The gap between the real and the drawn is here constitutive and deep.

The flows of observation kept up. Marks, attendance, assessments, observed behaviours; and, more and more, the flows of observation of the content consumed by pupils — recommendation algorithms, time spent, digital itineraries. Two families of flows coexist: those that the institution keeps up on the pupil, and those that platforms keep up on the pupil without their knowledge, or almost.

The observational optimum and the perils of making. The dominant peril is the **confusion of the indicator with the real**: taking the mark for learning, time spent for attention, attendance for engagement. Overdrawing on the pupil — measuring them continuously — produces an abundant datum but one that can degrade what it measures, by transforming learning into observable performance. The **loop** is strong here: what is assessed guides what is learned.

The circulation of the sector's data. School data circulate towards families, institutions, sometimes private providers. The circulation of the platforms' flows of observation is massive and opaque: the pupil is observed by apparatuses whose chain neither they nor their teachers can follow back. The loss of context and the impediment to going back to the source are the rule there rather than the exception.

Reception. This is where the sector takes on its full meaning. Education is the place where one should learn to **read the flow** — to recognize a flow of observation, its criteria, its intention, its undrawn. Now pupils are massively exposed to flows (recommendations, news feeds) that they undergo without reading them, through **over-throughput**: they see things pass without deciphering them. Training for reception is learning to choose a posture — **framing** one's attention, **delegating** with full knowledge of the facts, **accepting** with lucidity what overwhelms them — rather than undergoing. The competence of reading the flow is the pedagogical stake specific to the digital moment, and it conditions all the other sectors: a citizen who does not know how to read a flow will be able to judge neither the air they breathe, nor the security figures, nor the climate syntheses, nor the arrival time they are promised. The school use of LLMs, a central one, belongs to chapter 10.

The political questions specific to the sector. Protection of minors' data, regulation of educational platforms, the place of flow literacy in curricula: so many questions that Part VI extends.

Leads for the data artisan. In education, the artisan distinguishes the indicator from learning, refuses to take the measurement for the real, and — above all — works to transmit the reading of the flow as a competence. Their probity is of the second order: not only reading well, but teaching how to read.

What the Sectoral Crossing Has Shown

Six sectors, a single grid. The cross-sector comparison brings out constants. The peril of confusing the datum with the real it describes — the indicator with learning, the ascertained with the committed, the air index with the air, the predicted arrival with the arrival — runs through all sectors. The loop, where observation modifies the observed, is everywhere, from the census to the clinical score and the recommended route. The undrawn is everywhere politically charged. And reception, long neglected in favour of making, appears as the rising stake: over-throughput, delegation, the structural unread recur from one sector to another.

The limit, here, is the same as for the historical atlas: these studies shed light on a structure, they do not dictate a conduct. Each sector has its own optimum, which only a situated practitioner can establish. The processual grid does not replace sectoral expertise; it gives it a common language to name what it encounters. It is this language that the toolbox of Part V makes handleable.

Part IV — Living with the LLM

Text written in May 2026. This is the chapter most exposed to lapse: the technical capacities of large language models evolve fast, and the practices of mitigation will have to be revised at each major technical leap — at a minimum once a year. The principles, for their part, hold; the tools named are dated.

Chapter 10 — The LLM as a Systemic Leap in Reception, and the Practices of Restoration

The Status of This Chapter: An Illustration, Not a Concept

First of all, a clarification that governs the reading. The large language model is not a concept of the trilogy. It is an **illustration** — major, urgent, dated — of concepts that, for their part, are generic and stable: the systemic leap set out by the first tome, and the situated reader, with the situated position of handling or processing that a machine can occupy, set out by the third. Everything that follows applies these concepts to a case of the present; nothing in it adds to the conceptual foundation. This discipline has a reason of substance and a reason of method. Of substance: making the LLM an autonomous concept would contradict the architecture of the trilogy, which explicitly places it among the examples. Of method: a concept of substance does not go stale, whereas a technical illustration goes stale in a few years — and this chapter carries, moreover, the nearest lapse date of the whole book.

The LLM is therefore treated as what it is: the most pressing case where a technical transformation replays, in reception, a systemic leap that also affects making. On this double count, it stands at the junction of the first and third phases.

Reminder of the Foundation: The Fusion of the Three Roles

The conceptual material of this chapter is set out elsewhere — in the reference note on the systemic leap of storage, and in the chapter of the

third tome on automatic reading. Its essentials are recalled here, with a reference to these texts for the detail.

Historically, access to stored knowledge rested on three separate functions. The **library**: the stock, the whole of what is preserved. The **librarian**: orientation, the one who knows where to search, who orders and orients. The **storyteller**: rendering, the one who gives form and meaning to what the stock holds. Stock, orientation, rendering — three functions held by distinct devices and persons. Diderot’s *Encyclopédie*, seen in chapter 3, was one embodiment of this: authors, apparatus of classification, mediating book, separated.

This separation was not only an organizational convenience. It was a **device of control**. Because the three roles were distinct, the reader could go back from a rendering to its source, contest a classification, judge whoever oriented. The separation made possible the return to the source, the traceability of the way taken, the legibility and the contestability of the shelving — and, above all, it kept up a counter-power: no actor alone held knowledge, from the stock to its shaping.

The large language model performs a **systemic leap**: it merges the three functions into a single instance. The same operation holds the stock, orients it and renders it, in a single and opaque gesture. This is not an improvement of the library; it is a change of regime, which removes the separation — and with it, what the separation guaranteed. The model does not give access to a stock that one could inspect; it renders without the source being separable from the rendering. It orients without one being able to read the principle of its orientation. The counter-power that the separation kept up is no longer held by the architecture.

And — this is the contribution of the third tome — this model that renders occupies a **situated position of handling or processing**, without being thereby an actual reader: it would be one only if a meaning were actualized for it, which the trilogy does not settle. When it “reads” the corpus that formed it, it does so through a window that is its own, with its bounds, its blind spots, its way of distinguishing and deciphering. Delegating one’s reading to an LLM is not accessing a reading without a point of view: it is inheriting the window of an automatic processing whose position and limits one does not know.

A Typology of Uses, Crossed with the Three Postures

Not all uses of an LLM mobilize the fusion of the three roles equally. Before acting, the practitioner gains by **positioning their own use**. Three classes are distinguished, which are crossed with the three postures of the reader (framing, delegating, accepting) seen in chapter 1.

Uses neutral with respect to the fusion. Reformulating a text one already has before one’s eyes, translating a fragment, correcting a style, generating variations. The human keeps the source; the model serves only

as a linguistic assistant. The fusion of the three roles is little mobilized, the losses are small. In terms of posture, the human **frames**: their window remains on a material they master, the model adds no hidden stock to it.

Uses at risk from the fusion. Synthesizing a file one has not read in full, informing oneself on a subject one knows poorly, drafting an argument in a technical field one does not master. Here, the human depends on the model for the stock, the orientation and the rendering at once: they can neither verify the source, nor judge the orientation, nor reformulate with full knowledge of the facts. The losses are at their maximum. In terms of posture, the human **delegates without knowing it** — they believe they are reading whereas they inherit a window whose bounds they do not know.

Uses requiring restoration. Deciding on the strength of a model, producing content meant to circulate, teaching. These uses are not forbidden, but they require that one *actively* restore the separation of roles. Not doing so is an **unassumed delegation**: delegating one's reading to a machine without answering for it, whereas the third tome holds the imputability of arbitration to be what is not delegated without remainder. The failure to restore, in these cases, is a **failure of the reader's probity**. The source sheet put it bluntly: the absence of restoration amounts to a resignation.

This typology does not lock a use into a definitive box; the same tool serves in turn for all three. It teaches one to recognize, each time, which class one is in — and therefore which posture is required.

Five Restoration Practices

For each role that the fusion removes, one or more practices partially restore it. These are **palliatives**, not solutions: they do not cancel the systemic leap, they mitigate its losses. The fusion remains; what human practices can restore is a share of what the architecture no longer holds. Each is anchored in a concept of the trilogy.

Restoring the library — the return to the source. When the content matters, demanding the underlying sources; having recourse to the devices that back the rendering with identifiable documents; verifying at least one source per output used. This is restoring the possibility of following **transport back to the source** — the provenance of the second tome. What this practice restores: the traceability of the origin. What it does not restore: the guarantee that the source cited really founded the rendering, since the link can be reconstructed after the fact.

Restoring the librarian — the traceability of the way taken. Keeping a consultation log: what one asked, of which model, on what date, with what reformulation. A simple practice, which restores a share of the **traceability** that the architecture removes — transport as a relation that one can document. What it restores: the memory of one's own steps.

What it does not restore: the legibility of the model's internal way, which remains opaque.

Restoring the storyteller — responsible synthesis. Never taking up a formulation of the model without reformulating it in one's own words. Reformulating obliges one to perceive, distinguish, decipher — to accomplish the **act of reading** of the third tome instead of delegating it. It is through this act that one becomes able again to answer for what one transmits. What it restores: understanding and responsibility. What it does not restore: what the model omitted and what one cannot reformulate for want of seeing it.

Restoring criticism — the legibility of the shelving. Comparing the output of one model with that of another, or with a source not produced by a model. The disagreement between two models, each in a **situated position of handling or processing**, reveals the zones where the shelving is uncertain — where their windows diverge, there is cause for wariness. What it restores: a signal on doubtful zones. What it does not restore: the errors on which two models agree through similar construction.

Restoring the counter-power — separation organized by humans. Never relying on a single model for a high-stakes decision. The separation of roles, which the architecture no longer holds, must be reorganized *around* the model by the humans who use it. This is an act of **collective wisdom** in the sense of the second tome: deciding together not to concentrate in one instance what must remain distributed. What it restores: an external counter-power. What it does not restore: the counter-power internal to the tool, structurally absent.

Sectoral Variations

The previous grid takes on a particular colour depending on the sectors of Part III. Their lines are sketched here; each could be the object of a brief practical sheet.

Education. The stake is to train for a discerning use from secondary school onwards, and to keep reading intact as a competence. Assessing a piece of work produced with a model presupposes distinguishing what the pupil deciphered from what they delegated. The specific risk: that a generation learns to receive renderings without ever having built the capacity to return to the source.

Journalism. Using a model in the newsroom without delegating the investigation. Traceability must be marked in the publication; the return to the source is there a deontological requirement before being a good practice.

Justice. Which uses are compatible with the requirement that decisions state their reasons? A decision that must state its reasons cannot rest on an opaque rendering: the use that compromises the traceability of the reasoning compromises the statement of reasons itself.

Medicine. Using a model in support without delegating the diagnosis. The responsibility of the clinician — answering for what they have read — forbids unassumed delegation. Assistance is legitimate; abdication is not.

Physical transportation. Using a model to plan, to synthesize states of the network or to assist traffic control, without delegating operating responsibility. The specific risk lies in freshness: a model is a backup that diverges, and in a sector where the datum goes stale in seconds for traffic control, its rendering describes a network that already no longer exists — every rendering must carry its age. The master competence there is to distinguish the observed datum from the verisimilar datum: a predicted arrival is not an arrival.

Administration and research. In administration, what traceability can be offered to the citizen on the documents produced with a model? In research, which use remains compatible with the verifiability of sources? One limit case deserves mention: when a model is trained on a corpus whose provenance has disappeared or become illegible, what it processes remains constituted, but the identity and the imputability of these data lose their footing; and where their interpretation has been lost everywhere, one touches the **dead datum** of the third tome. Recognizing the nature and age of the corpora that feed a model is, in this respect, the master competence of the lucid practitioner.

What This Chapter Has Shown, and Its Limits

The LLM does not remove knowledge: it removes the separation of roles that guaranteed control over it. Such is the transformation, and restoration practices do not reverse it — they make it livable, partially, for whoever wants to go on practising their craft lucidly. That is all they can do, and it is already a great deal.

The limits are of two orders. The first is of substance: no human practice restores what an architecture has removed; palliatives mitigate, they do not repair. The second is of form, and therefore of date: this chapter will age fast. The technical devices mentioned will evolve, some of the terms used here will soon be obsolete, and the grid will have to be worked through again at each leap. This is the accepted price of a chapter that deals with the most shifting of objects with the most stable of concepts. The toolkit, here more than elsewhere, is dated — and saying so is part of its probity.

End of Part IV.

Part V — Toolbox

Text written in May 2026. Operational tools are a datable form; they are valid for about five years before revision. The concept that founds them, for its part, does not go stale. Each tool refers to the concept of the trilogy that carries it and, where relevant, to the competence of the artisan's framework and to the exercise of the apprenticeship manual that deepen it.

Chapter 11 — Checklists, Grids, Signature Sheets, Exercises

Tools, Not Norms

A tool is not a rule. The rule dispenses with thinking; the tool opens a question. All the objects in this chapter are **triggers of questioning**, never norms to be applied mechanically. A checklist ticked without thinking is worth nothing; a grid that delivers an automatic verdict betrays the spirit of processual ontology, where each flow has its own optimum and each reader their window. These tools serve to *forget nothing essential*, not to replace situated judgement.

They derive from the ecosystem of the data craft — competency framework, apprenticeship manual — of which they offer a shorter and more accessible operational overview. They do not replace the artisan's training; they give a foretaste of it that any practitioner can use.

Five tools are proposed, covering the three phases of the datum.

Tool 1 — Checklist of the Encountered Flow of Observation

Eleven questions, one page. To ask yourself when you are presented with a data set, an indicator, a figure.

This checklist is the version of the general grid of chapter 2 that can be ticked. It goes through the three phases.

Making 1. From what flow of the real does this datum come — or from what act, from what data? 2. Who dug it, with what intention? 3. What are the criteria — cadence, scope, instrument? 4. What units, norms, implicit references? 5. What was *not* drawn and could be relevant? 6. What is the date of the drawing? What is its functional age? 7. Is the flow in a decision loop — does it modify what it observes? 8. What structural biases does the class of annotator generate?

Circulation 9. Can the upstream chain be followed back to the source? Through how many hands, copies, reprocessings has the datum passed — and what may it have lost or undergone there?

Reception 10. For my use, is this flow suited — or unsuited? 11. Do I have the means and the time to really read it, given my window as reader — or is it going to submerge me? If I do not read it, is it incapacity, disinterest, or rapid lapse?

Foundations: Tome 1 (questions 1-8), Tome 2 (question 9, provenance), Tome 3 (questions 10-11, the situated reader and the three paths). Question 9, reformulated, attaches traceability to transport; question 11 is the reception addition that completes the original version.

Tool 2 — Lapse Grid

Table to be filled in for each datum. Trigger of a question, not a verdict.

<i>Datum</i>	<i>Fragment of the real observed</i>	<i>Speed of change</i>	<i>Functional age</i>	<i>Probable path of non-actualization</i>
Demographic datum	Population	Slow	Several years	—
Economic indicator	Market	Fast	Days to weeks	Rapid lapse
Environmental measurement	Air, water	Variable	Hours to months	Depending on use
Behavioural score	Person	Fast	Days	Rapid lapse

The last column is the reception addition: it links functional age to the **three paths** of the third tome. A datum with very brief freshness belongs to **rapid lapse** — its normal fate is to pass into lapse for the intended use without having been actualized, and this is not a failure. The grid thus recalls that it does not judge the *quality* of a datum, but its *validity for a use*: a perishable datum is not a bad datum, it is a datum whose validity window, for the intended use, is short — and which can remain valid for another, history or the archive.

Foundations: Tome 1 (two times, lapse), Tome 3 (the three paths).

Tool 3 — Work Signature Sheet

One-page template, to be placed at the head of any delivery of a flow or of a consolidated datum.

WORK SIGNATURE

- Artisan: [name]
- Delivery date: [date]
- Type of work:
 - *Tended flow of observation*
 - *Consolidated datum*
 - *Diagnosis*
- Question of use: [short sentence]
- Main criteria:
 - *Scope*: [...]
 - *Cadence*: [...]
 - *Intended fidelity*: [...]
 - *Corpus used*: [...]
- Observational optimum: [justification of the arbitration]
- Transport / fidelity expected at reception: [what the recipient must be able to do for the reader's share to be practicable; possible alterations on the way]
- Intended reader's window: [to whom it is legible, on what conditions]
- Known limits: [...]
- Estimated validity: [...]
- Conditions of maintenance / re-drawing: [...]

Two fields complete the original template. **Transport / fidelity expected at reception** anchors the signature in the second tome: transport is a relation between two movements, and signing a work is making the reader's share practicable — not only depositing the datum somewhere. **Intended reader's window** anchors it in the third: a work is made to be read by someone situated, and saying so is part of the delivery. Without these two fields, one would sign a datum as if it did not have to be received — which forgets the opening lesson of the second tome: a datum that no one receives exists, constituted, but remains solitary, and its transport is not accomplished.

Foundations: Tome 1 (criteria, optimum, two deaths via the conditions of maintenance), Tome 2 (transport, fidelity), Tome 3 (reader's window).

Tool 4 — Awakening Exercises

Short exercises, half an hour, for lower and upper secondary school and the general public. They take one from the three abstract phases to the reflex.

The orphan figure. Faced with a figure quoted in the press — “23% of French people...” —, reconstitute the flow of observation that produced it: what real, what drawing, what criteria, what intention. (*Making.*)

The observation notebook. Observe a simple phenomenon — an anthill,

a crossroads — for fifteen minutes, then formalize one's own choices of criteria and their limits. One experiences from the inside that drawing is choosing. (*Making.*)

What was not said. Faced with an article, list the parameters not cited and their possible relevance. One learns to see the undrawn — and, already, the unread. (*Making and reception.*)

The missing date. Faced with a graph without a date, estimate the probable age of the data and what it changes in the interpretation. (*Making, two times.*)

The feed that spills over. Faced with a continuous flow of information — a news feed, a notification inbox —, identify one's own window as reader and explicitly choose a posture: framing (restricting what one follows), delegating (to a third party, to a filter, knowing that one inherits its window), or accepting with lucidity not to read everything. One experiences over-throughput and the responsibility of the posture. (*Reception — exercise added to anchor the third tome in the toolbox.*)

Foundations: Tome 1 (first four exercises), Tome 3 (the fifth, and the reception dimension of the third).

Tool 5 — Canal Review Template

Standard agenda for a team that maintains a flow of observation. Fixed periodicity, monthly or quarterly.

1. Volume and quality of the drawings since the last review.
2. Calibration of the instruments — drift ascertained?
3. Relevance of the criteria with regard to current use.
4. Reference corpus — still sufficient?
5. Possible loops — effects observed?
6. Signals of lapse — what to refresh?
7. Maintenance load — sustainable?
8. Decisions and arbitrations — who answers for them?
9. **Effective reception** — is the flow read by those for whom it is meant, or does it remain not actualized through incapacity, disinterest, or rapid lapse?

Point 9 is the reception addition. A review that looks only upstream — calibration, corpus, lapse — forgets that the value of the canal is realized only if it leads to a reader. A perfectly tended flow that no one reads is a constituted but not actualized flow; the review must see it, and distinguish whether this non-reading is a failing to be corrected (incapacity, disinterest) or the normal fate of a datum with brief freshness (rapid lapse).

Foundations: Tome 1 (calibration, corpus, lapse, loop), Tome 3 (effective reception, three paths).

How to Use the Box

These five tools are not all used at once nor in all contexts. The checklist serves in front of a datum received; the lapse grid, when age is at stake; the signature sheet, at the moment of delivering; the exercises, for training; the canal review, for tending. Good use is selective: taking the tool the situation calls for, and holding it for what it is — a trigger, not a verdict.

A limit, to finish, which holds for the whole box. These tools help to ask the right questions; they never provide the answers. None says what age is acceptable, what fidelity is enough, what posture to adopt. These answers are situated, and that is why the book works them through sector by sector rather than claiming to settle them. The toolbox is the handleable embodiment of the processual grid — a lamp one can hold in one's hand, not a chart of the reefs.

End of Part V.

Part VI — Economic and Political Forms

Text written in May 2026. This is, with the chapter on the LLM, the most dated part of the book: the projects, institutions and regulations cited may evolve or disappear within three to five years. Each example carries its status. The conceptual substance on which this mapping rests — circulation, the sharing of the fact, collective wisdom — does not go stale; the forms that embody it do.

Preliminary Note — Mapping, Not Campaigning

This part deals with the economic and political forms that the governance of data takes today. It strictly obeys the book's principle of even-handedness (the quality of being just and impartial): it **maps**, it does **not plead**. Three main models coexist in 2026 — the concentrated private model of the large platforms, which dominates; the sovereign state model, reactive and under construction; the model of the commons, emerging and fragmented. Processual ontology offers a conceptual frame to these three models; it elects none of them. Making the trilogy a manifesto for cooperatives, for state sovereignty or for data activism would be confusing the substance with a political preference.

One point calls for constant vigilance. The second tome carries a thread — collective wisdom, and its formula “abstention is not neutral”. This thread *resembles* a stance in favour of restraint and of the commons. It is not one. The tome establishes a **descriptive finding**: abstaining from drawing or from circulating is an act that engages, and this finding holds at all times. It prescribes no institutional model. In this part, collective wisdom is mobilized as a **reading grid** for practices — to understand what such and such a movement does, or does not do — never as an **endorsement** of these practices. The distinction between finding and prescription is the main shoal of the whole part; it will be held firmly.

Each strand is attached to the phase of the datum it governs, for the political dimension lodges above all in circulation — the second phase.

Chapter 12 — Law in Evolution

The first tome puts two questions to data law — upstream of the act that draws, downstream of a protection conceived for a durable object — and leaves the answer to debate. Three directions of evolution of the law are derived from them here, which this chapter compares with the positive law of 2026, without pleading for or against: it **maps the gap** between the concepts of the trilogy and existing law, at a given instant. This gap will shift as the law evolves — which is consistent with the dated status of the part.

The three directions act on different phases of the datum, and distinguishing them in this way clarifies their reach.

The right to non-drawing acts on **making** (first phase). It would aim to recognize a right not to be drawn — that certain flows of observation not be dug at all. Positive law offers a partial echo of it: the GDPR recognizes a right to object (Article 21) and founds most processing on a legal basis, sometimes consent (Article 6). But objection is exercised on processing already under way, and it runs up against limits — legitimate interest, legal obligation. A right to non-drawing would be further upstream: it would concern the very digging of the canal, not the use of the water already drawn. The gap between the concept and positive law is considerable here, and the concept does not say how to institute it — it only points to the zone.

Transparency on the gesture of annotation acts on **circulation** (second phase). It would aim to make legible, all along the chain, who drew a datum, according to what criteria, with what intention — to restore the traceability of transport that the second tome showed to be so fragile. Positive law approaches it indirectly: the European AI Act brings in obligations to document training corpora. But this requirement remains confined to artificial intelligence systems; extending it to every flow of observation would be another matter. The gap, here again, is mapped, not filled.

Automatic lapse stands at the **crossing of making and circulation**. It would aim to attach to a datum a duration of validity linked to its freshness, beyond which it would be erased — which would oblige one to say for what use, since validity, for the trilogy, is judged use by use. Positive law knows storage limitation (Article 5) and the right to erasure (Article 17), but these obligations are conditioned by the *purpose* of the processing, not by the *freshness* of the datum. Moving from an obligation linked to purpose to an obligation linked to lapse would be a change of logic. One case illustrates the difficulty well: case law on the right to be forgotten has had to deal with baptism registers — precisely the historical case of chapter 3 — and

ruled that the interest in their preservation prevailed. A datum can be at once stale for one use and legitimately preserved for another: proof that functional lapse and legal obligation do not coincide.

This mapping is not a plea to reform the law in one direction or another. It shows where positive law and the concepts of the trilogy coincide, and where they diverge. The strand could, in time, justify an autonomous legal study conducted with a lawyer — outside the scope of this book.

Chapter 13 — Data Cooperatives

The cooperative model is often presented by analogy with agricultural cooperatives: pooling of means, democratic governance, collective ownership. The analogy is enlightening, but it hides a difference that the second tome makes it possible to name — and this difference is the true conceptual foundation of data cooperatives.

An agricultural cooperative pools **rival goods**: a tractor, a silo, a packaging line. What one uses, the other does not use at the same moment. A data cooperative pools something else entirely: a **shared fact**. The second tome established it — transporting a datum does not move it, it **multiplies its carriers**; it is not ceded like an object, it is shared like a fact, without whoever transmits it being dispossessed of it. It is this property, and not the agricultural analogy, that founds the very possibility of a data cooperative: one can pool a datum without losing it, share it a thousand times without exhausting it. The agricultural model gives the form of governance; the sharing of the fact gives the matter. This non-rivalry is ontological: it does not settle, on its own, the rights over the database nor the protection of persons, which the cooperative must still organize.

Forms exist in 2026, which must be cited with their status, for they evolve fast. MiData in Switzerland, in the field of health; Salus.coop in Spain; experiments with *data trusts* in the United Kingdom; various sectoral cooperatives elsewhere. Their viability depends on known factors: a critical threshold of members, a governance that holds, an economic model, and a way out of the dilemma between commercial capture and pure altruism. The favourable sectors are those where pooling the fact creates a value that no member alone could produce: health, agriculture, energy, mobility.

The limits must be named as much as the promises, on pain of pleading instead of mapping. A cooperative can become a new monopoly; it often depends on a technology it does not master; its initial financing is fragile; and the traceability of the chain, as members multiply, can degrade. The model is promising; it is not without shoals.

Chapter 14 — Digital Sovereignty and Institutional Commons

This chapter deals with the forms in which an authority — a state, a foundation, a consortium — takes charge of a flow of observation as a good of collective interest. The question that runs through it is the one that the third tome reformulates in terms of **probity**: *who answers for the flow?*

Digital sovereignty projects seek to remove critical flows from the concentrated private model. Gaia-X, in Europe, is the most cited example — with, to date, a mixed assessment. A dated mention is required: what is said of Gaia-X in 2026 will very probably be revisable in three to five years, whether the project is completed, transformed or abandoned. Other approaches exist elsewhere, according to different national or regional logics. The concept does not settle between them; it sheds light on what they have in common: moving the answering for the flow from a private actor to a public or sovereign instance.

Institutional commons offer another model of answer. Projects such as the large open knowledge bases, the foundations for scientific data, the collaborative mappings, rest on governance by editorial teams, scientific committees or community moderation, and on financing by grants, foundations or micro-contributions. They embody a distributed answer to the question “who answers for the flow?”: not an owner, but an organized community.

The master question remains: *who answers for the flow?* The state, the cooperative, the foundation, the consortium — each answer engages a different organization, different guarantees, different fragilities. The probity of the third tome, which was the ethics of the individual reader, finds here its collective counterpart: an institution shows probity when it knows which flow it answers for, at what freshness, before whom. The concept asks the question; it leaves the forms to answer it diversely.

Chapter 15 — Data Activism and Democratization

This last strand deals with citizen movements that build counter-flows or audit existing flows. It is the most exposed to the risk of slipping from mapping to campaigning; it will therefore be held with particular vigilance, mobilizing collective wisdom as a grid, not as an endorsement.

The conceptual thread is here the relation between **collective wisdom** and **self-amplification**, both from the second tome. The torrent swells through self-amplification: the loop digs its own bed, circulation calls for circulation. The practices of citizen audit, of requests for access to administrative documents, of building counter-flows by civil society, can be read as gestures that oppose this self-amplification — acts by which a collective

decides not to let the torrent sweep everything away. This is precisely what collective wisdom names: abstention, or inflection, is not neutral, and it becomes a position that can be weighed only where the choice is made visible and deliberate.

But — and this is the limit to be held — saying this is *describing the structure* of these gestures, not *approving* them. The same frame would shed light just as well on the opposite practices. Collective wisdom is not a flag of data activism; it is a grid that makes it possible to understand what any actor does who adopts or refuses a regime of circulation. It is applied here to citizen movements because that is the object of the chapter, not because one endorses them.

Movements exist, to be cited with caution and with their status: organizations promoting open data, collectives of algorithmic audit, movements of data journalism. Their emerging practices — citizen audit of public algorithms, counter-flows of observation, large-scale training in reading the flow — are described, not recommended. As for **training** in flow literacy from school onwards, it joins chapter 9 directly: a citizen who knows how to read a flow is better equipped in the face of the torrent, whatever the model of governance they prefer otherwise.

A scholarly mention, finally, to be situated without becoming attached to it. The critique of *dataism* — the denunciation of a slope where everything becomes data — is conceptually close to processual ontology, but distinct: it denounces, where the trilogy proposes a frame. Recent work on the democratic governance of data extends these debates; its frame is still being formed, and it is mentioned as work in progress, not as established doctrine.

What the Mapping Has Shown

Four strands, one and the same refusal: that of settling. Law, cooperatives, sovereignty, activism are so many forms that the political question of the datum takes in 2026 — and processual ontology offers them all a language, without crowning any of them. What the crossing brings out is that the political dimension lodges almost entirely in the second phase, circulation: it is because the datum is duplicated and shared like a fact that its ownership, its governance, its sharing raise questions without equivalent in the world of rival goods.

The limit of this part is inscribed in its date. Everything named in it — projects, institutions, regulations — may have changed by the time one reads it. This is assumed: a practical application that wanted to speak of political forms without going stale would speak of nothing. The substance, for its part, holds: circulation raises political questions of its own, the sharing of the fact founds unprecedented models, and collective wisdom

sheds light on choices without dictating them. The forms will pass; the grid will remain to read those that succeed them.

End of Part VI.

Closing — The Revisable Map

Text written in May 2026.

Chapter 16 — Status of This Book and Conditions of Its Revision

A Toolkit, Not a Lamp

The trilogy was a lamp: it lit up the area where one must look, without making the chart of the reefs. This book is a toolkit. It takes the lamp and makes from it objects that can be handled — historical illustrations to recognize the structure, sectoral studies to work it through on a given ground, a chapter on the LLM to face the most pressing leap, a toolbox to act, a political mapping to situate collective choices. These objects serve to do things; now what serves to do things wears out.

This is the difference of status that must be held to the end. The trilogy says what is true of the datum for a long time. This book says what this truth implies, in this year, in these sectors, with these tools. The first ages slowly; the second fast. This asymmetry is not a defect of the book: it is its very function. A practical application that did not go stale would not be a practical application — it would have given up coming down into contact with the present.

What Goes Stale and What Holds

One can, in each part, separate what holds from what will pass.

What holds: the grid of the three phases, because it comes from the trilogy. The concepts — flow of observation, two times, transport as a relation, act of reading, three paths, collective wisdom — do not go stale, by construction. The structure of the book holds as well: the four dimensions, the grid of treatment of the cases, the standard structure of the sectoral studies. These are stable forms, because they fit a stable substance.

What will pass: all the rest, at various rhythms. The overviews of the current state of the sectors (five to ten years). The operational tools (five years). The economic and political forms, projects and regulations (three to five years). The chapter on the LLM, the most shifting (two to four years, annual revision). The historical cases, for their part, do not go stale — but the scholarly studies that shed light on them do, and the conceptual comparisons derived from them remain revisable.

The reader is thus forewarned: they hold a dated document, each part of which carries its own deadline. The systematic dating, present at the head of each part, is not an affectation; it is the probity of the book towards its reader — telling them when what they are reading dates from, so that they can judge for themselves what may have changed.

How This Book Will Have to Be Revised

Revising this book does not require touching the substance. The substance is in the trilogy, and it does not move. Revising consists in taking up the dated forms as they age, without ever altering the grid that organizes them.

Three rules for this revision. The first: never introduce, in revising, a concept absent from the trilogy. If a new fact of the present seems to require a new concept, it is almost always that an existing concept has been badly mobilized — or that the fact belongs to another frame. The conceptual grid remains closed; only the illustrations change. The second: revise part by part, according to the deadlines specific to each, rather than the book as a block. The chapter on the LLM will call for several revisions when the historical atlas will require none. The third: at each revision, re-date. A revised form that does not carry its new date lies to its reader.

The Map and the Map-Makers

This book is a map. It sets out, at this moment, what processual ontology implies for the gesture. But a map does not replace the journey. Faced with a real datum, in a real sector, at a real date, it is for the situated practitioner to judge — what age is acceptable, what fidelity is enough, what posture to adopt in the face of over-throughput. The book does not settle these questions; it teaches how to ask them, and it recalls that they have a common structure, already met elsewhere, already named by the grid.

That is all a practical application can do, and it is its right measure. It does not decide in the practitioner's place — that would be falling back into object ontology, where the datum and its good management would be things one possesses once and for all. It equips a judgement that remains, for its part, irreducibly situated. The concept lights up the area where one must look; the toolkit helps one to work there; but the chart of the reefs, in each particular water, is still and always for the navigator to make.

It remains to be done. The book is written so that this work does not start from nothing.

End of the book.

Translation choices

These notes say how to read the English words that render the terms of the corpus; they are fixed for the whole English translation by the *Translation Charter of the Corpus*.

- **datum / data.** The corpus treats the datum as an individual: constituted by an act, dated, carried by media. The translation therefore says *datum* in the singular and *data* as its plural.
- **drawing / to draw** (*prélèvement, prélever*): the gesture of drawing from the flow, as one draws water. *Draw* is kept for this gesture; *derive*, *take* and *make* render the other senses (*dresser la carte* → *make the chart*). The **undrawn** (*le non-prélevé*) is what was not captured. The **apparatus** (*dispositif*) is what observes and draws; *device* keeps its everyday sense. An **entry** (*relevé*) is the value inscribed.
- **canal** (*canal*): the canal dug in the river, never a *channel*. The **canal review** is the periodic review of a tended flow.
- **The three phases** (*les trois temps*): **making**, **circulation**, **reception**; the **two times** of the datum are the time of inscription and the time of the real.
- **lapse; stale** (*péremption; périmée*): a relation, not a decay; a datum goes stale *for a use*, and **validity for a use** is the measure of it. **Rapid lapse** is one of the three paths; a **lapsed datum** is stale for current use and may remain valid for another.
- **transport; physical transportation** (*transport; transport physique*): *transport* alone is always the movement of the datum (Tome 2); the movement of goods and persons is **physical transportation** or **mobility**, and the companies that carry them are **transport operators**. **Carrier** renders *porteur*, what carries a datum.
- **actualized** (*actualisée*): the act by which a reading produces a meaning, never the updating of a file. A **situated position of handling or processing** may be occupied by a human or a machine; a machine is an **actual reader** only if a meaning is actualized for it.
- **the three paths** (*les trois chemins*): **incapacity**, **disinterest**, **rapid lapse**. *Path* is kept for them; *way* or *route* renders *chemin* and *voie* elsewhere. **Neglect**, **mute**, **dead** and the **structural unread** (*le non-lu structurel*) name the datum not read for want of attention, unreadable for one reader, unreadable for all, and not read because the instruments of an institution do not distinguish it.
- **over-throughput** (*sur-débit*): never *overload* or *overflow*.

- **ascertain; finding** (*constater; constat*): *observation* is kept for the doctrinal gesture. Police statistics therefore count **ascertained** offences (*infractions constatées*), as against **committed** offences.
- **render; restore** (*restituer; restaurer*): the storyteller **renders** the content of the stock (*rendering, restitution*); the **restoration practices** of chapter 10 (*pratiques de restauration*) restore the separation of roles that the LLM removes. **Shelving** renders *rangement*; the **verisimilar datum** is the datum produced by modelling.
- **trace** (*trace*): reserved for the mark that the real leaves of itself. *Traceability* renders *traçabilité*; going back up a chain is *following it back*.
- **The data artisan** (*l'artisan de la donnée*): the referent whose domain would be the datum itself, a craft yet to be created; the **data craft** (*artisanat de la donnée*) is that craft.
- **toolkit; toolbox** (*trousse à outils; boîte à outils*): the toolkit is this book as a whole; the toolbox is its Part V.
- **Proper names.** The French text borrows the English *évenhandedness*, with a gloss; the translation keeps the gloss. The *Académie del Cimento* is given under its usual English name, the *Accademia del Cimento*; the *Encyclopédie* keeps its French title. The GDPR renders the RGPD.
- **Titles.** *Tried by the Flow* renders *À l'épreuve du flux*; this volume is *The Canal and the Workshops*; its five tools are the *Checklist of the Encountered Flow of Observation*, the *Lapse Grid*, the *Work Signature Sheet*, the *Awakening Exercises* and the *Canal Review Template*.

From the River One Observes to the Workshops Where One Works

Three tomes followed the datum along its life: its making, in *The River and the Canal*; its circulation, in *From Spring to Torrent*; its reception, in *The Trace or the Datum*. Together, they set out a grid – the flow of observation, the two times, transport, the act of reading, lapse – and defended a stance: saying what is true of the datum for a long time, without coming down to the tools of the moment, which go stale.

This restraint left the practitioner wanting more. The teacher who wants to train people to read the flow, the caregiver who shares a file, the decision-maker who assesses an automated score, whoever would like to use a large language model with full lucidity: none of them found in the trilogy the tools of their craft.

The Canal and the Workshops fills what the trilogy had left empty, without ever touching it. It does not tell a story: it equips. Historical cases where the grid can be recognized bare, sectoral studies worked through across the three phases of the datum, practices for living with the LLM, a handleable toolbox, a mapping of the political forms of the datum — without pleading.

None of these tools dictates a conduct: each is a trigger of questions, dated and revisable. For the concept lights up the area where one must look; it does not make the chart of the reefs. That chart, in each particular water, is for the navigator to make. This book is the toolkit they take on board.