·Chapter 8·

MAKING THE BEINGS OF TECHNOLOGY VISIBLE

The singular silence imposed on technologies ⊙ and on their particular form of transcendence ⊙ requires, in addition to an analysis in terms of networks [TEC · NET], ⊙ the detection of an original mode of existence ⊙ different from reproduction [REP · TEC].

We need to return to the experience of the technological detour, ⊙ which is hidden by Double Click and the form/function relation.

By drawing out the lessons of the [REP · REF] crossing on this point ⊙ we shall no longer confuse technology with the objects it leaves in its wake.

Technology offers a particular form of invisibility: ⊙ the technological labyrinth.

Its mode of existence depends on the [MET · TEC] ruse ⊙ as much as on the persistence of the beings of reproduction [REP · TEC].

The veridiction proper to [TEC] ⊙ depends on an original folding ⊙ detectable thanks to the key notion of shifting.

The unfolding of this mode gives us more room to maneuver.

Let me reassure the reader: by trying to define the relations that the Moderns maintain with the beings of metamorphosis—relations limited to beings that produce psyches but that the other collectives have ballasted quite differently—we have not manifested a dubious penchant for phantoms, witches, or demons. We have simply tried to understand why the cosmology of the Moderns remains so hard to retrace, so contradictory to the lessons of experience. To continue our warm-up exercise and really benefit from the ontological pluralism that will allow the inquiry to count more than two modes, we are now going to try to capture beings that enjoy an entirely different status in modernism. "The modernization front allowed the Moderns to represent themselves," we speculated, "as the people who put an end to superstitions and finally discovered the effectiveness of technologies." We now know what to think of the first part of this claim; what are we to make of the second?

The singular silence imposed on technologies

When informants insist on the nonexistence of certain beings, they make them proliferate, but when they emphasize—and so proudly!—the massive presence of other existents, we can scarcely make them out. This is the case with the beings of technology (noted [TEC]). The transition from beings of magic and charms to beings of technology is by no means unheard-of; Gilbert Simondon had already broken the path in his book *On the Mode of Existence of Technical Objects*, a text as famous as it is little read. In passing from one mode to the other, we are

going to add more depth to what has already been said more than once about the not-so-very material **MATTER,** that "idealism of materialism" of the Moderns. In turning toward the craftsmen, the ingenious engineers who actually build engines and machines, we shall be able to clarify the strange notion of construction to which "**CONSTRUCTIVISM**" does not seem to be particularly faithful.

In the eyes of our ethnologist, one of the most astonishing aspects of the Moderns is not the way they treat divinities, knowledge, or gods, but the fact that they grant so little room to what has defined them most sharply in the eyes of all the others since the era of the great discoveries began: the art and manner of deploying technology. Those who pride themselves on being "solid materialists" do not seem to have given a second thought to the solidity of **MATERIALS** (a word that we shall use to intensify the contrast with matter). Dismissing religion with scorn is understandable: that figure has not managed to hold its ontological ranking in the face of competition from the sciences. Nothing is more natural than being skeptical about the beings of metamorphosis and their tamperings: they always contaminate those who manipulate them in rather dangerous ways. But tools? Robots? Machines? The very landscape that they have ceaselessly turned over and plowed for hundreds of thousands of years, the inventions that have disrupted our lives more than all the other passions over the last three centuries, the systems of production on such a massive scale that they now weigh heavily on the whole planet?

And yet for a thousand books on the benefits of objective knowledge—and the mortal risks that challenging it would entail—there are not ten on technologies—and not three that signal the mortal danger one risks by not *loving* them. Even political philosophy, less prolix than epistemology, can still flatter itself that it has engendered more books than the philosophy of technologies; we could count the latter on our fingers. The proof of this decline is that in the word epistemol*o*g*y* we still hear knowledge *about* knowledge, whereas in the word technol*o*g*y*, despite the efforts of André Leroi-Gourhan and his disciples, we fail to remember that some sort of reflection *on* technology lies imprisoned. We don't hesitate to say about the most modest washing machine full of chips that it is an instance of "technology"—even "modern technology"—but we

don't expect to learn any lessons from it. We ask a "technician" only to come repair our machine; we don't ask him for an in-depth reflection on it. What would we do with his philosophy? Everyone knows that technology is nothing but a heap of convenient and complicated methods. There is nothing to think.

Even if the ethnologist is no longer surprised at how hard it is to find reliable informants on questions so central to those she is studying, because of the consubstantial distinction between theory and practice, she continues to be astonished that there is no legitimate institution to shelter technologies, any more than there is one to teach us how to come to terms with psychogenic beings. How have the Moderns managed to miss the strangeness, the ubiquity, and yes, the spirituality of technology? How could they have missed its sumptuous opacity? Our ethnologist begins to note: "We don't really know what they *make*. Father, forgive them, they don't even know what they *do*."

AND ON THEIR PARTICULAR FORM OF TRANSCENDENCE

If we can hesitate over the mode of existence of reproduction **[REP]** (because its persistence hides its gaps), if we hesitate again over that of chains of reference **[REF]** (because once we reach remote entities, we are in danger of ultimately forgetting the instruments that have allowed us this access), we must hesitate also over the HIATUS introduced into each course of action by the detour and delegation proper to the technological trajectory. One little error of inattention, and we risk missing its own characteristic form of mini-TRANSCENDENCE.

All modes can be said to be transcendent, since there is always a leap, a fault line, a lag, a risk, a difference between one stage and the next, one mediation and the next, n and n + 1, all along a path of alterations. Continuity is always lacking. There is nothing more transcendent, for example, than geodesic reference points with respect to the readings jotted down by a surveyor-geometrician in his notebook—forms in the first and second meanings given in Chapter 4 **[REF]**; nothing more transcendent than the question of a single line of text proposed to the jury in a trial in relation to the thousands of pages of a heavy dossier rolled on a trolley all the way to the court reporter **[LAW]**; nothing more transcendent than the relation between the lukewarm character of a perfunctory prayer and the gripping effect of grasping its meaning for the first

time [REL]; nothing more transcendent than the relation between the papier-mâché stage setting and the exuberance of the characters that seem to emerge from it [FIC] (whom we shall learn to encounter later on); nothing more transcendent than the distance separating what you were from what you have become after being seized by a psychogenic being [MET]. Transcendences abound, since between two segments of a course of action there is always a discontinuity of which they constitute, as it were, the price, the path, and the salvation.

These are what we must learn to name, every time. Do we need to recall that, in the eyes of the anthropologist, who has been forced to become something of a metaphysician in order to succeed in her quest, there are no longer two WORLDS, the first one immanent and full, *above* and *beyond* which another has to be added—the supernatural—and *beneath* which, for good measure and in order to house "representations," still another—interiority—has to be carved out? There is no longer anything before her but *subnatural* beings—Nature included!—that are all *slightly* transcendent in relation to the previous stage of their particular paths. They form networks, and these networks most often pay no attention to one another, except when they intersect and have to come to terms with one another by avoiding category mistakes insofar as possible. What appears most lacking is IMMANENCE, or rather, immanence is not native but secondary, and it too depends on a very particular mode of existence, as we shall see in Chapter 10. The world, or rather the multiverse, is thus full of—or rather, no, the multiverse is constantly *emptied out* by—circulating transcendences that dig down into it, all along a subtle *dotted line* formed by the leaps and the thresholds that have to be crossed one after another in order to exist a little longer. In short, an obstacle course.

The reader must now see why the investigator could not possibly do justice to technologies with the two patterns of "Objects" and "Subjects" as her only resources. In comparing modes of existence she is complicating her task, to be sure, since she has to multiply the templates of beings to be taken into account, but, in another sense, she is *simplifying* the task, since she finally has on her workbench a large number of different instruments for determining the weight of each mode by *comparison*.

Simondon's genius lay in seeing that one could not specify the mode of existence of technological beings without *titrating* them

thanks to the beings of magic, religion, science, and philosophy. Every handyman knows that his skill increases if he has at his disposal not just a few rudimentary tools but a panoply of screwdrivers and wrenches, saws and pliers. This is the only rational use that can be attributed, as I have already said, to Occam's proverbial razor. We use it clumsily if we start making random cuts to limit the number of beings arbitrarily. On the contrary, it should be used like a workbench where tools of various sizes can be used to cut out, following the articulations of the creature itself, *all* the modes of existence, without condemning any one of them to the cutting-room floor…

REQUIRES, IN ADDITION TO AN ANALYSIS IN TERMS OF NETWORKS [TEC · NET],

To advance on this new construction site, our ethnologist can rely on what are now often called *socio-technological networks*. This is of course a mild euphemism for describing the surprising heterogeneity of the material arrangements according to the well-identified mode of networks [NET]. As if a nuclear power plant, a drone, an eel trap, or a metal saw could be content to maintain itself in existence with the help of elements from two domains, the "social" and the "technological"—and these two alone. The ethnologist has already learned this at her own expense: even though what historians call "technological systems" do exist on the local level, they are no more made *of* technology than law is made *of* law or religion *of* religion. What complicates the analysis is that there is no domain at all that can be mistaken for that of "technology" (there is no domain of "the social," either, but that is another matter).

To follow even the smallest course of action, she is going to have to record the various segments that belong, for example, to dozens of scholarly disciplines, to the economic arbitrations performed by groups of experts, to international standards, tests of the resistance of materials (often contested, moreover), social laws, as well as gear drives, chemical reactions, or electric currents, all this very quickly mixed up with questions of patents, breakdowns, pollution, or organization. It is no accident that the very notion of network (this time in the sense of the ACTOR-NETWORK THEORY) cut its teeth, as it were, on the foregoing DOMAIN of technology. This is because we have to *add* various things for any technology to start working [TEC · NET]!

The tools for our inquiry are well known, and their fruitfulness no longer needs to be demonstrated. All we have to do is reconstitute the path taken by the smallest innovation, follow the slow process of learning a previously unknown skill, come across an object whose meaning completely eludes the archaeologists or the ethnologists, in order to record the countless discontinuities that are necessary for the continuity of any action whatsoever. But it is with *controversies* that the heterogeneity of technological systems appears most clearly. An accident, a breakdown, an incident of pollution, and suddenly the "system," by dint of polemics, trials, media campaigns, becomes as unsystematic as possible, multiplying the unforeseen branchings that delight sociologists of technology.

It was surprising to learn that an investigative commission finally decreed that the catastrophic explosion of the spaceship *Challenger* had come about owing to the resistance to cold of a small rubber O-ring, but also to the distribution of decision-making responsibilities in NASA's complicated flowchart. It is surprising to note, thanks to violent polemics, that, in order to limit the proliferation of green algae on the beaches of Brittany, the mayors of municipalities dependent on tourism have to pay as much attention to elections in agricultural unions as to the reactions of nitrates or to the enticing propositions of garbage collection equipment salesmen, not to mention bringing in the minister of the environment along with the laboratories of the French Research Institute for the Exploitation of the Sea. The more one studies technological arrangements, the more one considers their ins and outs, the less chance one has of unifying them in a coherent whole.

If there is one area in which the results of science studies and technology studies can be considered robust, it is indeed in the vertiginous deployment of the heterogeneous elements necessary for the maintenance of technological arrangements. These studies can always be criticized when they bear on the sciences because of the key question of relativism—we have spent a fair amount of time on this—but the deployment they have made possible for technological systems no longer poses any problems except that of access to the terrain. When we talk about a "technological infrastructure," we are always designating a more or less patched-together mix of arrangements from more or less

everywhere that others seek to render *irreversible* by protecting it from analysis, making it a carefully sealed and concealed BLACK BOX. It may be hard to penetrate these places that have been made secret, but it is never because we would come across chains of indisputable necessities. There is no area of technology whatsoever that would send us back all sanctimoniously to the sole ineluctable fate of "materiality." Here, at least, the advantages of constructivism are clear: everything that has been *set up* can be broken down.

THE DETECTION OF AN ORIGINAL MODE OF EXISTENCE

And yet, even if we are becoming familiar with that literature, we are not necessarily coming closer to a mode of existence other than that of networks. There is indeed discontinuity, there is indeed heterogeneity, there are indeed surprises all along each course of action, every time we discover the *other* components that "spring into action" to complete a given course of action, but in the end we are simply following the logic of this already well-demarcated mode of existence. Even if he does no more than look around in his own vicinity, the reader will notice without difficulty that he cannot make a gesture without *passing through* one or the other of those ingredients, whose mediation, intervention, and translation are indispensable to its achievement. However lazy he may be, even if he is just shifting position in his hammock, it is *through* this hammock that he must pass to keep himself up in the air, keep himself away from the stinging nettles or the ticks on the ground . . . It is indeed on the solidity of this weaving and these ropes that *he rests*. It is to them that he delegates the task of *holding him*. Is there in this *detour* and this *delegation* something more than the surprising linkage between beings on which every existent depends for self-maintenance—and that we already know how to note as [NET]?

This supplement is not so easy to capture. Not only because there is no identifiable domain or institution of technology, but because if we begin to follow the list of beings necessary to the maintenance of any being at all then *everything*, on this basis, becomes technology. Not just the hammock but also the two solid tree trunks to which it is attached! They too depend for their existence on a multiplicity of beings with which they have "learned to connect" and which they have "turned away" from their initial goals—yes, translated, enrolled and twisted—as surely as the strands of fine wool have been taken from the fleece of

a sheep. All beings, to maintain themselves, have turned others away from their own paths.

Might we be dealing then with the beings of reproduction [REP]? This is definitely the case when we talk about the "evolution" of trees, the "invention" of photosynthesis, the "discovery" of leaves during the long "history of life." It is as though we were imagining that the beings of reproduction had had "to solve problems" and that they had "chosen" one particular branching rather than another. The hammock and the tree to which it is solidly attached would then share the same inventiveness, the same capacity to enroll other beings: sheep, for the first, nodules and bacteria for the second. In short, all existents would stem from the same technicity.

DIFFERENT FROM REPRODUCTION [REP · TEC].

And yet we have a clear sense that by assimilating the hammock with the tree this way, by assimilating the beings of technology with the beings of reproduction [REP · TEC], we would be making a diagnostic error as surely as if we confused them with networks [TEC · NET]. For with the beings of technology, we are dealing with something new in the order of alteration. If we can imagine a technological history of trees—for example, the "invention" of photosynthesis—it is because we imagine that the tree could have *started over several times*; that it could have benefited from *several chances* to persist in being by combining in different ways those beings it had at its disposal. Now, it is precisely the opportunity to start over that is absolutely unavailable to the beings of reproduction.

This is even what defines them: they throw themselves into the hiatus of existence without any possibility of turning back. As we saw above, this is their harsh, devastating felicity condition: to be or no longer to be. We can of course read the evolution of living beings—and even of inert ones—according to the mode of technological beings [TEC], but here we are dealing with a feature that we shall come across many times during our inquiry: each mode grasps all the others according to its own type of existence—and misunderstands each of them in a particular way each time. To undo the [REP · TEC] crossing, we would still need to be able to define what is truly original about the alteration proper to technological beings.

WE NEED TO RETURN TO THE EXPERIENCE OF THE TECHNOLOGICAL DETOUR, ▶

Let us try, as we have each time, to approach experience while setting aside the hope of making it coincide with a domain. To learn to speak appropriately about it, let us recognize that technological **TRAJECTORIES** are not easy to grasp and that they do not go straight—no more than do the beings responsible for the establishment of chains of reference [**TEC · REF**]. Everything in the practice of artisans, engineers, technicians, and even weekend putterers brings to light the multiplicity of *transformations*, the heterogeneity of combinations, the proliferation of clever artifices, the delicate setups of fragile skills. If this experience remains difficult to register, it is because to remain faithful to it we would have to accept its scarcity, its dazzling invisibility, its deep constitutional opacity. For it is always oscillating between two lists of contradictory elements: rare and ordinary, unforeseeable and predictable, fleeting and constantly begun anew, opaque and transparent, proliferating and controlled.

This experience seems to bring us to grips with what can be defined at first as a dazzling zigzag. Thanks to unpredictable detours, beings very far away in the order of reproduction become the missing pieces in a puzzle that requires an unexpected degree of ingenuity. Through a long series of detours, each cleverer and less predictable than the next, we find atomic physics turning up, for example, in a hospital wing for cancer treatment. By another detour, wood and steel are mutually implicated in the grip of a well-balanced hammer. By still another, the successive layers of a program, a compiler, a chip, a radar, manage to complicate each other and align themselves to the point of replacing the solid couplings that up to now had connected the cars of an automated subway system, ending up with wholly calculated "nonmaterial couplings." Moreover, it is not always worth the trouble to look far and wide for brilliant innovations so as to grasp the detours they have taken, their total originality. We can find the same flashes in the humble gesture of the tinkerer who finds a wedge to keep a door from closing too quickly, or in the minuscule discovery of a designer who shifts the placement of the handle on a handbag or the cap on a medicine bottle. "There's a trick to it," just waiting to be found; that's the whole thing in a nutshell.

Like Zorro, the technological being traces a fiery Z in a lightning stroke! Let's try to follow this zigzag. Nothing more common, more ordinary: you were heading for your office, getting into your car, and suddenly, without quite grasping what's going on, you find yourself in a garage, trying somehow to understand what a mechanic in work clothes is muttering as he crouches under the chassis, seeming to point with his hand dirtied by the oil leaking out to a part whose name and function escape you completely, except that (you are beginning to get it) you are starting to "expect miracles" from the availability of the spare part and from the skill of the mechanic, knowing that "you're going to have to go through this" if you want to find the path to your office again—and that, in addition, when it comes time to pay the bill, you're "going to feel it." A cascade of indubitable detours.

There, you have felt the breath of technology pass over you, but—here is the whole difficulty—*only for a brief moment*. As soon as you have paid the bill and left the garage, the purring under the hood will make you *forget everything* right away—even if you continue to grouse about the bill for a while. It is this strange presence and absence that makes the beings of technology in fact so difficult to grasp. Like the beings of metamorphosis, would these also be beings of occultation, then? Would they also depend on a particular "pass," even a magical sleight of hand? No doubt about it, to write up the specifications of these beings the analyst is going to have to take into account, simultaneously, the *detour*, this zigzagging course, the *delegation* that makes the action reliant on other materials, and the *oblivion* that the beings leave behind once the new composition has been established. In this, they differ from the beings of metamorphosis, which cannot be forgotten for a second: if you forget them, they will "get" you around the next corner. Technology, for its part, seeks to be forgotten. Definitely, it is about technology rather than nature that we can say "it likes to hide."

What is interesting, in the case of technology, is that this zigzag that ought to be so easy to grasp, given that the experience is so common, in fact totally disappears, for two related reasons: the habitual ravages of Double Click on the one hand and on the other the confusion that is always made between technology, or the technical,

→ WHICH IS HIDDEN BY DOUBLE CLICK AND THE FORM/FUNCTION RELATION.

and the things left in its wake. Contrary to the title of Simondon's book, it isn't the mode of existence of the technological *object* that we must address but the mode of existence of technology, of *technological beings* themselves. (Let us recall that, in this inquiry, we are shifting from the question "What is the *being* or the *identity of* X or Y?" into a different question: "How are we to address *beings* or alterities, the *alterations* X or Y?")

Let's begin with Double Click [TEC · DC]. He has come, as always, to propose his services and calibrate a manner of being for which he is even less apt than for judging the path followed by facts, demons, angels, or legal means. But, as usual, instead of rejecting such a manifestly inadequate template, he has chosen to bring technology, too, into this Procrustean bed. Whereas the whole experience rebels against such a mutilation, he has acted as though technology, too, *transports* mere information, mere forms, *without deformation*. It is true that the engineers haven't protested; they go to great lengths to resemble the image of stubborn and somewhat dopey characters that has often been attributed to them! Double Click strikes everywhere: knowledge, yes, psyches, yes, but also, but especially, matter. If we want to measure the gulf that the Moderns are capable of digging between practice and the account of their practice, we must look not only into epistemology, psychology, or theology but also into TECHNOLOGY (used here in the sense of reflection *on* technology).

How could we impose a transport without transformation on a technological act when everything points to the opposite? It suffices to add *utility*, *effectiveness*, or, to use a more technical term, *instrumentality*. Effectiveness is to technology what objectivity is to reference: the way to have your cake and eat it too, the result without the means, that is, without the path of appropriate mediations (we shall see later on that the same thing is true for Profitability, the third Grace of this archaic mythology). All the technological whirlwinds and troublemakers can be forgotten all at once if you say that you are only transporting through the technological *object* the *function* that it must content itself with fulfilling *faithfully*. If you succeed in seeing in all technology a preexisting form that it applies to a hitherto inert and formless matter, then you are going to be able, by sleight of hand, to make the material world disappear even while giving the impression that you are populating it with

objects whose materiality would have the same phantasmatic character as that of Nature! Here is where *Homo faber* comes on stage, shaping his needs through tools by "effective action on matter." Four little words as completely innocent as they are inadequate to grasp such a zigzag: there is no matter, one does not act "on" it, the action is not "effective" (it will be, perhaps, but later on), and, finally, as we shall see, it is not at all certain that this is an "action," at least not the action of "someone."

Give me needs and concepts, the form will arise from them and the matter will follow. An automobile? It "corresponds" exactly to the "need for transportation," and each of its forms "follows" from the needs of drivers. A computer? It "fulfills effectively" the function for which it was conceived. A hammer? It too derives from a reflection on the "best way" to balance an arm, a lever, wood, and steel. Molière made fun of the "sleep-inducing virtue" of the poppy invoked by doctors; the humorist is not far behind when, to a child's series of questions about one technological arrangement or another, he responds disingenuously: "That's what it was made for!" If there is an unworthy way to treat technologies, it lies in believing that they are means toward ends.

What do they become in this case? Thought applied to matter, itself conceived as **FORM** (in the third sense of the term), so that, once again, form and thought repeat each other, and this repetition arouses the same enthusiasm among the rationalists as *adequatio rei et intellectus*. We have lost the materials, we have lost the technological detour, we have lost the clever artifice. When people say of technologies that they are neither good nor bad, they forget to add: nor neutral.

BY DRAWING OUT THE LESSONS OF THE [REP · REF] CROSSING ON THIS POINT ⊙

Fortunately, the investigator knows how to undo this amalgamation, since she finds herself situated at the same branching point as the one that had already almost made her miss the worth proper to the sciences. The scorn with which people view technologies comes from the fact that they are treated according to the same model that we saw used to misunderstand the work of reference. Just as there was, in epistemology, a theory of objectivity as "correspondence" between map and territory, there is in technology a theory of effectiveness as *correspondence* between form and function. Technology is believed to be an action stemming from a human being—most often male, moreover—that would

then bear "on" matter itself conceived through confusion between geometry and persistence [REP · REF]. Technology then becomes an application of a conception of science that is itself erroneous!

If there really is one thing that materialism has never known how to celebrate, it is the multiplicity of materials, that indefinite alteration of the hidden forces that enhance the shrewdness of those who explore them. Nothing is less proper to technologies than the relation between the end and the means, since ends and means are invented simultaneously. It is a grievous misunderstanding to claim to see technologies as mere "applications of Science" and mere "domination of Nature"—we now know how to counter the weight of the mistakes borne by those two proper nouns.

As we can see, it is not only psyches that suffer from being misunderstood; technicians fare no better. The Moderns view them as scientists, but of lower rank—and they are mistaken about both groups. But it is not technology that is empty, it is the gaze of the philosophy of being-as-being, which has deliberately emptied itself of all contact with its own experience. In the finest dam, this philosophy doesn't manage to see anything original with regard to Being. "Mere beings," Heidegger would say, thus repeating and reinforcing the universal movement that obscures the scientific enterprise. Science is merely an avatar of Technology, after the latter has already been misunderstood as *Gestell*: a masterful misunderstanding about mastery; a fine case of forgetting being as technological; a quite cruel lack of ontological generosity!

The idea that one could *deduce* all the twists and turns of technological genius by always-well-formed a priori principles has always made engineers laugh—although not out loud. Isabelle Stengers had the idea of undertaking a radical thought experiment to reduce all technological inventions to the "basic principles" recognized by scientists and presented to students as their "incontestable foundations": reduced to the Carnot cycle, locomotives would immediately stop running; limited to the physics of lift, airplanes would crash; brought back to the central dogma of biology, the entire biotech industry would stop culturing cells. What have to be called the *invisibles* of technology—deviations, labyrinths, workarounds, serendipitous discoveries—would vanish, reducing the efforts of the sciences to nothing [TEC · REF]. No more

invisibles; no more domination. For Vulcan the Lame doesn't care a whit about Athena's claim that she can impose her laws on him.

For ingenuity, everything in materials is food for thought. How have we lost this contrast to the benefit of a dream of control and domination? How have we been able to neglect the MATERIOLOGY that was honored by an entire, admittedly somewhat obscure, tendency in French philosophy, from Diderot through Bergson and of course Simondon to François Dagonet? The loss is as serious for a civilization, as we shall see, as is the loss of the religious or the political modes. Just as tragic an inversion, since technologies follow such twisted paths that they leave in their wake all sorts of other invisibles: danger, waste, pollution, a whole new labyrinth of unanticipated consequences opened up under our feet and whose very existence continues to be denied by those who think they can go directly ahead, without mediations, without running the risk of a lengthy detour, "straight to the goal." The "magic bullet," the "technical fix." A strange blindness on the part of the Moderns toward the most precious source of all beauty, all comfort, all efficiency. What a lack of politeness toward their own genius! It is awfully late to speak out of the blue about the *precautions* that should be taken to love technologies with all the delicacy required.

⊙ WE SHALL NO LONGER CONFUSE TECHNOLOGY WITH THE OBJECTS IT LEAVES IN ITS WAKE.

But the difficulty we have grasping the beings of technology arises, too, from the fact that the term "technological object" leads analysis astray, because we can clear up the misunderstandings of Double Click only by focusing on the hiatus itself and not on what it leaves behind *after* it has sketched out its mark in the form of a lightning stroke. We shall never find the mode of technological existence *in* the object itself, since it is always necessary to look *beside* it: first, between the object itself and the enigmatic movement of which it is only the wake; then, within the object itself, between each of the components of which it is only the temporary assemblage. And the same thing applies to the skillful gestures that the artisan eventually makes habitual, after long practice: when we began to establish them, they required the presence of a technological detour—which was painful and strenuous; but once these gestures become assured, routine, regulated, adjusted, we no longer feel them, any more than we feel the presence of the mechanic in

the purring of the engine under the hood. Despite what is often said of cold, smooth technology, in it there is never anything but *breaks in continuity*; things never quite connect. And even if we forget technology and let the thing created live its life, as soon as the thing in question needs to be maintained, restored, revised, renewed, other ingenious approaches will be required; we shall have to invoke the spirit of technology once again to maintain it in being. There is nothing more "heteromatic" than a robot, an **automaton**.

TECHNOLOGY OFFERS A PARTICULAR FORM OF INVISIBILITY: ⊙

The technological object is opaque, and—to put it bluntly—incomprehensible, the ethnologist concludes, in that it can only be understood provided that we add to it the invisibles that make it exist in the first place, and that then maintain, sustain, and sometimes neglect and abandon it. To learn to enter into relations with the beings of **[tec]**, we thus have to avoid, as always, the temptations of Double Click and go backward from the things to the movement that has transformed them and of which they are never anything but a provisional segment along a trajectory whose signature is singular.

This is why it is important to talk about **operational sequences**, as technologists following André Leroi-Gourhan have done, to try to determine the trajectory proper to technologies that leave objects in their wake, of course, but that cannot be reduced to those objects. The test of this encounter with such sequences is easy to administer: it suffices to stand idly in front of a "gadget," a "gimmick" whose meaning completely eludes you—perhaps a gift you have received, or an apparatus whose purpose is unclear, or a rock from the Châtelperronian period with cut marks made by someone who disappeared forty thousand years ago: everything is there, and yet *nothing is visible*. As if the object were only the print of a trajectory whose direction escapes you and that you have to learn to reconstitute, a fragment at a time.

Which leads our investigator again into more than one quarrel. "Mind in machines? No, really, here you're exaggerating. Invisibles again? It's a mania, an obsessional tendency to add irrationality even at the heart of the most material, the most rational effectiveness!" "And yet without the invisibles, no object would hold together, and in particular no automaton would achieve this marvel of automation." "Ah,

you mean that there are technicians, engineers, inspectors, surveyors, intervention teams, repairmen, regulators, *around* and *in addition to* material objects? In short, humans, and even a 'social context'?" "No, I didn't say anything of the sort, for the good reason that technologies *precede* humans by hundreds of thousands of years. I am simply saying that if you are capable, you Moderns, of leaving out the paths of reference when you speak of objective knowledge, you are perfectly capable of leaving out what is responsible for the instauration of technological objects on the pretext (which is also true) that they hold up on their own once they are launched. Except that they can never remain alone and without care—which is also true! It is only the flow of operational sequences that allows us to sketch them." Technology is better hidden than the famous *aletheia*.

THE TECHNOLOGICAL LABYRINTH.

If the investigator is determined to speak of invisibles, it is not owing to a taste for the irrational, it is in order to follow the thread of this labyrinth rationally—the real labyrinth, the one that the architect Daedalos built for Minos. If nothing in technology goes in a straight line, it is because the logical course—that of the *episteme*—is always interrupted, deflected, modified, and because in following it one goes from displacement to deviation: in Greek, a *daedalion* is an ingenious detour away from the direct route. This is what we mean, quite banally, when we assert that there is a "technological problem," an obstacle, a snag, a bug; this is what we are referring to when we say of someone that "he's the only one with the technical ability" to solve a given problem: "he has what it takes," "he has the knack." We need to see "Technique" and "Technology" not in their noun forms but as adjectives ("that's a technical issue"), adverbs ("that's technically/technologically feasible"), even sometimes, though less often, in verb form ("to technologize"). In other words, "technology" does not designate an object but rather a difference, an entirely new exploration of being-as-other, a new declension of alterity. Simondon, too, made fun of substantialism, which, here again, here as always, failed to grasp the technological being. To borrow from Tarde one of the fine words that he opposed to the exclusive search for *identity*: what is the *avidity* proper to the mode of technological existence?

ITS MODE OF EXISTENCE DEPENDS ON THE [MET · TEC] RUSE

If technology, like the metamorphoses we have just been studying, like all the other modes, explores alterity, it must do this in its own way. But which way? Without question, it's a matter of a leap, a fault, a break, even, a rupture in the course of things, something we cover over rather too hastily with the term *invention*, whether modest or brilliant, it hardly matters. We can grasp this first of all as a derivation of two of the modes we have already recognized. As if technology relied on the power of metamorphoses **[MET]** to extract from the beings of reproduction **[REP]** unknown new capacities.

To convince ourselves of this, all we have to do is look around. If you begin to think about the materials that went into the objects that surround you, you have to think in terms of many metamorphoses. The stones of which your house is built lay in a distant quarry; the wood in your teak furniture was doing its thing somewhere in Indonesia; the sand from which your crystal vase is made was sleeping deep in some river valley; the hammock where you are snoozing as you read this book was still wool on the back of a sheep; and so on. Yes, there is magic in technology—all the myths tell us this, and Simondon grasped it better than anyone. Look around you again: you will have a lot of trouble establishing any *continuity* between the quarry, the tropical forest, the sandpit, the sheep, and the forms they managed to suggest to their manufacturers as they became some of the components of your home. There has thus been transmutation, transformation. And it is no accident that we speak, with reference to technology, about ruse, skill, indirection, cunning. There are many **HARMONICS** between the subtlety necessary to interact with the beings of metamorphoses and the subtlety that has to be put to work to find the "trick." This is why myths so often bring together the lessons of these two types of ruse and deviation. At all events, both types *hedge*. There's an admirable popular expression for this in French: *C'est qu'il y a toujours moyen de moyenner*. There's always a way to muddle through, to manage. If Ulysses is "crafty," if Vulcan limps, it is because, in the vicinity of a technological being, nothing goes straight, everything is done on the bias—and sometimes, even, everything goes askew.

◁ AS MUCH AS ON THE PERSISTENCE OF THE BEINGS OF REPRODUCTION [REP · TEC].

But at the same time, my table, the walls of my house, my crystal vase *persist* after their transformation. Unlike the beings of metamorphosis, once they have been radically transformed the beings of technology *imitate* those of reproduction through their persistence, their obstinacy, their *insistence*. It is as though technology had dragged some of the secrets out of reproduction [REP · TEC] and of metamorphoses [MET · TEC] by *crossing* the two species of modes of being. Technology appears in a first approximation as a mixed mode: proteiform speed on one side, persistence on the other. It's hardly surprising that Prometheus's fire has been seen as something that liquefies all things and at the same time gives them new durability, solidity, consistency. No archaeologist worthy of the name fails to be moved by the pottery she digs up, which, even in shards, will last as long as our Earth.

As we can see, the adjective "technological" does not designate in the first place an object, a result, but a *movement* that is going to take from inert entities and from living ones—including the body of the artisan, which becomes more skillful by the day—what is needed to hold together in a lasting way, to freeze, as it were, one of the moments of metamorphosis. Neither the wall nor the table nor the vase—nor the car nor the train nor the computer nor the dam nor the culture of domesticated bacteria—is "technological" once it is left to its own devices. What is lasting and persistent in these things depends on the presence of composites that have been drawn out by metamorphoses [MET] from the persistence of beings of reproduction [REP], each of which lends certain of its virtues, of course, but most often without leaving us the possibility of profiting from its initiative and its autonomy in a lasting way. The ingredients of these blends always remain foreign to one another. They "lend themselves," as the expression puts it so well, to being translated, deflected, disposed, arranged, but they nevertheless remain "themselves," ready to let go at the slightest pretext. If we are not careful, the wall falls down, the wood is eaten away by worms and crumbles into dust, the crystal cracks, the car breaks down, the train derails, the bacteria culture dies, the hammock's ropes fray; as for the computer, it malfunctions through a sort of malevolent depression. What is certain is that the technological detour leaves behind a differential, a gradient of

resistance, a whole leaf-pile or layering of diverse materials that holds up "on its own" and at the same time can be dispersed. The expression *traduttore, traditore* applies much better to technologies than to texts.

What mode goes further in alteration than this one? The risk of reproduction is admirable, of course, but the beings of reproduction never cross existents in as dizzying a fashion as the components of the humblest technology **[REP · TEC]**. This is what reduces the paleontologist in the Olduvai Gorge to tears when he is lucky enough to come across a stone carefully worked on both sides. In a Museum of Natural History we can be very impressed by the profusion of living beings (a fine example of **[REP · MET]** crossing), yes, but the series of bicycles in the Museum of Arts and Crafts, or the electric locomotive gliding noiselessly into the train station along its shiny rails, ought to move us just as much. Through technology, the being-as-other learns that it can still be even more infinitely *altered* than it thought possible up to that point.

THE VERIDICTION PROPER TO [TEC] ⊙

But is there a veridiction proper to the beings of **[TEC]**, the ethnologist wonders, as she continues to complete the **SPECIFICATIONS** for this mode? At first glance, to speak of the truth and falsity of technology seems to make even less sense than speaking of the truth and falsity of the beings that produce psyches. How could they, too, have **FELICITY AND INFELICITY CONDITIONS**?

And yet our investigator will not hesitate long, provided that she begins to count the number of times her informants affirm that they *judge* a tool, a function, a utensil for its good or poor quality, and provided that she notes the subtle way they seem to creep along the gradient that goes from the least effective, the least useful, to the *most* effective, the *most* useful, the *best* adapted. The least skillful project manager working for the Paris subway system explores all the possible solutions, one by one, to make sure that the nonmaterial couplings that connect the cars of the automated metro system succeed in *holding to* the constraints of the design office. The clumsiest cook rummages in her drawer until she finds the right knife, the one best *adjusted* to the job. The most sybaritic of sleepers punches his pillow until he finds the right *harmony* between his head and the cushion. How much time does it take a dog trainer to learn how to *correspond* with the animal and end up learning from it?

Don't look at the most skillful artisan, but rather at the apprentice who is seeking skill through a slow trajectory and finds himself corrected at every step by his master. Don't try to grasp the movement of a technology that's "working," but rather the gropings of innovation, precisely where something is not yet working and obliges the artisan to *start over* several times, going from one obstacle to the next. "Judgment," "adjustment," "rectification," "fresh start," no question about it, here we find ourselves confronting difference—often mute, perhaps, but always extraordinarily subtle—between the true and the false, the well made and the poorly made.

It is this displacement, this translation, completely original every time, that artisans, architects, engineers practice day after day, and that Double Click no more manages to grasp than he does chains of reference [REF]; and for the same reason he mistakes the final result—yes, it is adjusted, yes, it works, yes, it does what it's "made to do," yes, it "holds together"—for the movement that led to that result [TEC · DC]. This sideways, crablike motion, this perpendicular movement of rummaging around, exploring, undulating, kneading, which so obstinately misses the relation between form and function and the relation between ends and means, is precisely the motion that will perhaps (but not necessarily) produce forms or means corresponding to functions or ends. To say that technologies are effective, transparent, or mastered is to take the conclusion for the pathway that led to them. It is to miss their spirit, their genesis, their beauty, their truth.

DEPENDS ON AN ORIGINAL FOLDING

What can we call this spirit that we would miss entirely if we were to make the mistake of limiting technology to the objects left in its wake without reproducing its ever-so-particular movement? How can we qualify its mode of being more precisely? In other words, what is the equivalent for the zigzags, the brilliant flashes, the detours and discontinuities, of *chains of reference* for objective knowledge [REF], *processions* for religion [REL], *means* for the passage of law [LAW], *persistence* for the beings of reproduction [REP]? We shall call it *technical* FOLDING. We could have used the word PROJECT, as opposed to "object," but we would have needed another mode, that of organization, a crossing that we shall not learn to master until much later [TEC · ORG].

The term "folding" will allow us to avoid the blunder of speaking of technology irreverently as a piling up of objects or as an admirable example of mastery, transparence, rationality, that would prove "man's dominion over matter." Technology always entails folds upon folds, implications, complications, explanations. Its canonical representation, thoroughly studied by the sociology of technologies, sketches it in the form of a series, often a very long series, of nested **TRANSLATIONS**, a labyrinth. There is technical folding every time we can bring to light this second-level transcendence that comes to interrupt, bend, deflect, cut out the other modes of existence, and thus by a clever ploy introduces a *differential* of materials.

Once we have been freed of our obsession with matter, nothing prevents us from identifying the diversity of these differentials. We can talk about technical folding with respect to the delicate establishment of muscular habits that make us, through apprenticeship, competent beings endowed with a high degree of skill, just as well as to talk about the molten iron that spews out of the Mittal blast furnaces, or to designate the distinction between a software program and its compiler, or to celebrate the legal "technology" that makes it possible to link a somewhat more durable text with a dossier that will be less durable, or to support an argument over a somewhat heavier and more cumbersome metaphor by using what is rightly called "literary technology." What counts, each time, is not the type of material but the difference in the relative resistance of what is bound together. Curiously, there is *nothing material* in technology. Where there is differential resistance and heterogeneity among the components, technology is found as well.

→ DETECTABLE THANKS TO THE KEY NOTION OF SHIFTING.

It is by insisting on the notion of **SHIFTING** that we shall succeed in qualifying these gradients of resistance more accurately. There is a great temptation, in fact, to think that if there are technologies, it is first of all because there are technicians! If we gave in to this view, we would be firmly placing the origin of technological beings in thought, or at least in the gestures of *Homo faber*. The spirit that we are invoking would simply be the inventive spirit of humans, the creator that has to precede all creation, or so we are told. This is indeed what we were supposing, in the fantasy sketched out above, when we were claiming to grasp the beings of reproduction in the

mode of technological invention [REP · TEC]. We were then imagining a manufacturer—"Mother Nature"—whose wisdom and inventiveness would have made it possible to solve the problems posed by another character, "Natural Selection." If we pretended to grasp living beings as technological inventions, it was only by making them stand out against the background of a giant factory animated by the spirit of an ingenious creator.

Now, by using the metaphor of shifting that comes from the mechanics of gear drives, SEMIOTICS may have put us (not necessarily on purpose) on the trail of an entirely different way of grasping technological beings. Let us recall that for semiotics, shifting—we shall come back to this in the next chapter—makes it possible to grasp a quadruple transformation starting from a zero point. To start with, displacements in time, in space, and in the type of actor. This is what we mean when we talk about *reprise*: others, elsewhere, before, after, go into action.

These three instances are easily recognizable in any technological detour whatsoever: when you are resting in the hammock, it is indeed the hammock that takes over—and it does not resemble you, others have woven it for you; when you entrust yourself to an aspirin tablet, it is the tablet, another actor from elsewhere, manufactured by others, to whom you have entrusted or delegated the work of treating your headache—and the tablet doesn't resemble you in the least, either; when a shepherd, tired of watching over his sheep, entrusts to a fence and to his dogs the task of protecting the flock against wolves (or perhaps stray dogs), those who are now standing guard are the fence posts, the barbed wire, and the dogs, each with its own history, its own fidelity, and its own fragility. With the folding of technological beings, a *dislocation* of the action emerges into the world and makes it possible to differentiate between *two levels*, the starting level and the one toward which you have precisely shifted gears by installing in it other actors who possess different resistances, different durations, different degrees of solidity. It was moreover this dislocation that interested us in the definition provided above for CONSTRUCTIVISM. Whatever the technological detour may be, this is in fact what makes it possible, not to do something, but to *have something done*.

But we mustn't forget the fourth agency involved in any operation of shifting. When an artisan, an explosives manufacturer, or an engineer goes into action, others do too, of course, but this also means that *the one* who manufactures is himself also shifted down. A new dislocation, which this time does not go ahead, toward level n + 1, but rather *falls short* of the starting point. This level n - 1 is presupposed, *implied* by the action, and it is this level that begins to give weight and shape to the virtual author of the action. If we always have to maintain the ambiguity of constructionism without ever believing in the assured existence of a builder, it is because the author *learns from what he is doing* that he is perhaps its author. In the case of technological beings, this general property is of capital importance, since technologies have preceded and generated humans: subjects, or rather, as we shall soon name them, **QUASI SUBJECTS**, have sprung up little by little from what they were doing. This is why we had to be so suspicious of the concept of "action on matter," which threatened to place the point of departure in the depths of a human subject instead of waiting for this human subject to emerge *from his works*—though the possessive adjective is quite unwarranted, because the human subject does not master "his" works any more than he possesses them.

Instead of situating the origin of an action in a self that would then focus its attention on materials in order to carry out and master an operation of manufacture in view of a goal thought out in advance, it is better to reverse the viewpoint and bring to the surface the encounter with one of those beings that teach you what you are when you are making it one of the future components of subjects (having some competence, knowing how to go about it, possessing a skill). Competence, here again, here as everywhere, *follows* performance rather than preceding it. In place of *Homo faber*, we would do better to speak of *Homo fabricatus*, daughters and sons of their products and their works. The author, at the outset, is only the *effect* of the launching from behind, of the equipment ahead. If gunshots entail, as they say, a "recoil effect," then humanity is above all the *recoil* of the technological detour.

THE UNFOLDING OF THIS MODE GIVES US MORE ROOM TO MANEUVER.

By freeing the beings of technology from their association with matter; by localizing their effectiveness a little bit ahead of the fabricating subjects; by completely abandoning the notion of mastery

and transparence; by letting these beings explore the entire gamut of materials; by no longer obliging them to remain confined in the narrow prison of means and ends, the inquiry could not only become compatible with the long history of technologies and the slow anthropogenesis that they have allowed, it could also open up less uneven interactions with the other collectives, since all humans are the children of what they have worked on.

We would no longer base the comparison on the somewhat wobbly expression "material culture," which technologists use as if the term "culture" remained problematic—given how much the so-called symbolic, aesthetic, and social dimensions of technology can vary—whereas the term "matter" would hardly pose any problems since everyone "clearly sees what is involved." Now, as we well know by now, nothing is less widespread throughout the world than the notion of matter or even that of production. The Australian aborigines whose toolbox contained only a few poor artifacts—made of stone, horn, or skin—nevertheless knew how to establish with technological beings relations of a complexity that continues to stun archaeologists: the differentials of resistance that they arranged were located rather in the tissue of myths and the subtle texture of kinship bonds and landscapes. The fact that their materiality was slight in the colonizers' eyes tells us nothing about the inventiveness, the resistance, and the durability of these arrangements. To keep open opportunities for negotiation over the successors of the contemporary production arrangements, it is crucial to restore to the beings of technology a capacity for combination that liberates them entirely from the heavy weight of instrumentality. Freedom of maneuver that is indispensable in order to invent the arrangements to be set up when we have to dismantle the impossible **MODERNIZATION FRONT**. If the verb "**ECOLOGIZE**" is to become an alternative to "modernize," we shall need to establish quite different transactions with technological beings.

We learn (we used to learn) in the catechism that the Letter of Scripture remains inert without the Spirit that blows where it will. This is even truer of the bleached bones of the technical object that are waiting for the spirit of technique to raise them up, recover them with flesh, put them back together, transfigure them—resuscitate them, if the word is

not too strong. The ethnologist has tears in her eyes in front of this Valley of the Dead that she sees in a sudden revelation. What? Are we going to have to restore to the Moderns not only the beings that engender psyches but also resuscitate for them the technologies of which they are at once so proud and so ignorant? "But why," she sighs at the prospect of such a mission, "why have they not known how to celebrate them with appropriate institutions?"