TECHNICAL MENTALITY[1]

Gilbert Simondon, translated by Arne De Boever[2]

This paper is not concerned with ontology but with axiology. It aims to show that there exists a technical mentality, and that this mentality is developing, and therefore incomplete and at risk of being prematurely considered as monstrous and unbalanced. It requires a preliminary attitude of generosity towards the order of reality that it seeks to manifest, because this incomplete genesis brings into play values that a general refusal [of this mentality] could condemn to ignorance and would risk negating.

We will try to show that the technical mentality is coherent, positive, productive in the domain of the cognitive schemas, but incomplete and in conflict with itself in the domain of the affective categories because it has not yet properly emerged; and finally, that it is without unity and is almost entirely to be construed within the order of the will.

I. COGNITIVE SCHEMAS

The theoretical domain was the first to emerge in Western civilizations, the first to have been theorized, systematized, and formalized. It has lead to productive constructions and it presents in itself a method of discovery and interpretation that can be generalized. In this sense, the technical mentality offers a mode of knowledge *sui generis* that essentially uses the analogical transfer and the paradigm, and founds itself on the discovery of common modes of functioning--or of regime of operation--in otherwise different orders of reality that are chosen just as well from the living or the inert as from the human or the non-human.

Leaving Antiquity[3] aside, technology has already yielded in at least two ways schemas of intelligibility that are endowed with a latent power of universality: namely, in the form of the Cartesian mechanism and of cybernetic theory.

In the Cartesian mechanism, the fundamental operation of the simple machine is analogous to the functioning of logical thought capable of being rigorous and productive. A simple machine is a transfer system that, in the particular case in which the movement is presumed to be reversible, in the state of equilibrium, establishes the identity of a work that puts into motion and a work that resists. If each piece of the machine carries out this transfer rigorously, the number of pieces can be whatever; what changes is merely the direction of forces--as with the pulley--or the factors (force and movement) of a product that remains constant, as in the case of the pulley-blocks. The rational mental process returns the essence of the customary technical objects to this transfer schema: a chain is an enchainment of links, with the second link being fixed to the first just as the first is fixed to the anchoring ring. The transfer of forces goes from link to link, so that if each link is welded well and there are no gaps in the enchainment, the last link is fixed to the anchoring point in a more mediated but also more rigorous way than the first. A building, stone upon stone, row upon row, in a transfer of the "certum quid et inconcussum",--the resistance of the stone of the foundations--all the way to the top, through successive levels that each act as the foundation for the immediately following higher level.[4] This intelligibility of the transfer without losses that mechanizes ideally and analogically (but also in reality, by virtue of the Cartesian conception of knowledge) all the modes of the real, applies not only to the RES EXTENSA but also to the RES COGITANS: the "long chains of reasons" carry out a "transport of evidence" from the premises to the conclusion, just like a chain carries out a transfer of forces from the anchoring point to the last link. The rules of the method are not only inspired by mathematics; they are also perfectly conform to the different stages of fabrication and technical control. Thought needs an anchoring point that is the operative equivalent of the stone under the building, or of the ring that is attached to the origin of the chain: *certum quid et inconcussum*: it is *evident* what remains after all attempts at deconstruction, even after hyperbolic doubt. The conduct of reasoning requires an analysis--a division of the difficulty in as many parts as possible and as needed in order to better solve the difficulty--because each piece of the intellectual montage must play a simple, univocal role--like a pulley, a lever of which the mechanical function in the whole is simple and perfectly clear. The third rule (of the synthesis or the order) is the arrangement according to the schema of the completely unified whole of the machine. Finally, the fourth rule, that of control, is the unification of the placement of the different pieces and the adaptation of the machine as a whole to the two realities at both ends of the chain.

What is carried out in both the rational study of machines and in the conduct of thought is the *transfer without losses*: science and philosophy are possible because the transfer without losses is presumed to be possible. Consequently, the only domains that are accessible to philosophical reflection are those with a continuous structure. It will therefore be clear why one has wanted to consider living beings as machines: if they weren't machines *ontologically*, they would have to be so at least *analogically* in order to be objects of science.

Cybernetics, which was born from the mathematisation of the automatic regulation apparatuses [dispositifs]-particularly useful for the construction of automatic equipment of airplanes in flight-introduces into this the recurring aim of information on a relay apparatus as the basic schema that allows for an active adaptation to a spontaneous finality. This technical realization of a finalized conduct has served as a model of intelligibility for the study of a large number of regulations--or of regulation failures--in the living, both human and non-human, and of phenomena subject to becoming, such as the species equilibrium between predators and preys, or of geographical and meteorological phenomena: variations of the level of lakes, climatic regimes.

In this sense, technology manifests in successive waves a power of analogical interpretation that is *sui generis*; indeed, it is not hemmed in by the limits of repartition of essences or of domains of reality. It does not take recourse to categories, leaves aside generic relations, special relations, and specific differences. None of the schemas exhausts a domain, but each of them accounts for a certain number of effects in each domain, and allows for the passage of one domain to another. This transcategorical knowledge, which supposes a theory of knowledge that would be the close kin of a truly realist idealism,5 is particularly fit to grasp the universality of a mode of activity, of a regime of operation; it leaves aside the problem of the atemporal nature of beings and of the modes of the real; it applies to their functionings; it tends towards a phenomenology of regimes of activity, without an ontological presupposition that is relative to the nature of that which enters into activity. Each of the schemas applies only to certain regimes of each region, but it can in principle apply to any regime of any region.

The application of such schemas of intelligibility requires two main conditions, which can be presented as postulates of the "technical mentality":

1. *The subsets are relatively detachable from the whole of which they are a part*. What technical activity produces is not an absolutely indivisible organism that is metaphysically one and indissoluble. The technical object can be repaired; it can be completed; a simple analogy between the technical object and the living is fallacious, in the sense that, at the moment of its very construction, the technical object is conceived as something that may need control, repair, and maintenance, through testing, and modification, or, if necessary, a complete change of one or several of the subsets that compose it. This is what one calls anticipated "maintenance," to use the Anglo-Saxon term.

This postulate is extremely important when one questions the way in which one can engage with a living being, a human being, or an institution. The holistic postulate, which is often presented as an attitude of respect for life, a person, or the integrity of a tradition, is perhaps merely a lazy way out. To accept or reject a being wholesale, because it is a whole, is perhaps to avoid adopting towards it the more generous attitude: namely, that of careful examination. A truly technical attitude would be more refined than the easy fundamentalism of a moral judgment and of justice. The distinction of the subsets and of the modes of their relative solidarity would thus be the first mental work that is taught by the cognitive content of the technical mentality.[6]

2. The second postulate is that of the levels and the regimes: *if one wants to understand a being completely, one must study it by considering it in its entelechy, and not in its inactivity or its static state*.

The majority of technical realities are subject to the existence of a threshold to start up and to maintain their own functioning; above this threshold, they are absurd, self-destructive; below it, they are self-stable. Very often, the invention consists in supposing the conditions of their functioning realized--in supposing the threshold problem resolved. This is why the majority of inventions proceed by condensation and concretization, by reducing the number of primitive elements to a minimum, which is at the same time an optimum.[7]

Such is the case, for example, with the stato-reactor of Leduc: on the ground, it is merely an absurd structure, incapable of providing a push in a determinate direction: but starting from a certain speed of movement, it becomes capable of maintaining its speed--in other words, its pushing forward--and of furnishing a usable energy of movement.

The GUIMBAL group--which is held entirely in the forced conduct of a dam--originally seemed absurd. The alternator is of such small dimensions that it seems that the armature must be destroyed by the Joule effect. But it is precisely this small dimension that allows for the alternator to be lodged completely within the canalization, on the turbine axis itself. This ensures a cooling that has a considerably greater effect than that of an alternator placed in the air. This disposition is made possible by putting the alternator in a casing filled with oil, which heightens the isolation and improves the thermal exchanges, all the while ensuring the lubrication of the different levels and preventing water from coming in: here, the multifunctional character of the oil of the casing is the very schema of concretization that makes the invention exist, as a regime of functioning.

Analogically, it is possible to anticipate the existence, within different orders of reality, of certain *effects* (used here as in the expressions "the Raman effect," "the Compton effect") that for their existence require determinate thresholds to be crossed. These effects are not structures; they are different from these structures in that they require the threshold to be crossed. An internal combustion engine that is turned off is in a stable state and cannot turn itself on; it needs a certain amount of energy coming from outside, it needs to receive a certain angular speed in order to reach the threshold of self-maintenance, the threshold beyond which it functions as a regime of automatism, with each phase of the cycle preparing the conditions of completion for the following phase.

From these few observations, we can conclude that the technical mentality already offers coherent and usable schemas for a cognitive interpretation. With the Cartesian mechanism and cybernetics, it has already yielded two movements of thought; but in the case when there is an awareness of the systematic use of the two postulates presented above, it also appears to be capable of contributing to the formation of larger schemas.

II. AFFECTIVE MODALITIES

The picture is much less clear, however, as soon as one tries to analyze affective contents. In this case, one encounters an antagonism between the artisanal and the industrial modalities, an antagonism that is paired to an impossibility of completely separating these two aspects. The craftsman's nostalgia traverses not only the industrial life of production, but also the different daily regimes of the consumption of goods coming from the industrial world.

It is difficult to return a bundle of perfectly coherent and unified traits to the opposition between the artisanal and the industrial modality when one wants to account for the genesis of affective modalities. However, we will propose a criterion that, after several attempts, seemed to be the least problematic: in the case of the craftsman, all conditions depend on the human being, and the source of energy is the same as that of information. The two sources are both in the human operator; there, energy is like the availability of the gesture, the exercise of muscular force; information simultaneously resides in the human operator as something learned, drawn from the individual past enriched by education, and as the actual exercise of the sensorial equipment that controls and regulates the application of the learned gestures to the concrete materiality of the workable material and to the particular characteristics of the aim [of the work]. The manipulation is carried out according to continuous schemas on realities that are of the same scale as the operator. Correlatively, the distance between the act of working and the conditions of use of the product of the work is weak: the shoemaker has directly taken the measurements, the saddler knows for which horse he is working; recurrence is possible: the speed with which the object wears off, the types of the deformation of the product during usage are known to the craftsman, who does not only construct but also repairs.

Moreover, in the case of the craftsman the relation between the Human Being and Nature is immediate, because it lies in the choice of the materials and of the work that is done on them. In the artisanal modality, work is artifice, it orders and makes act differently workable materials that are almost primary materials, but that remain close to the natural state, like leather or wood. Artisanal work is generally not preceded by a complete transformation of these primary materials. The latter would require the investment of sources of energy taken from outside of the human body. In this sense, such a transformation comes--even in the pre-industrial state--from an industrial schema, namely that of metallurgy, which is industrial through the transformation of the mineral into metal, even if it remains artisanal because of the way it produces objects.

The industrial modality appears when the source of information and the source of energy separate, namely when the Human Being is merely the source of information, and Nature is required to furnish the energy. The machine is different from the tool in that it is a relay: it has two different entry points, that of energy and that of information. The fabricated product that it yields is the effect of the modulation of this energy through this information, the effect that is practiced on a workable material. In the case of the tool, which is handheld, the entry of energy and the entry of information are mixed, or at the very least partially superimposed. Of course, one can guide the chisel of the sculptor with one hand, and push it with the other, but it is the same body that harmonizes the two hands, and a single nervous system that appropriates their movement into such detail from the material and for the set aim. The potter's work, which is moved by his feet, is still of the same kind, but it allows one to anticipate the birth of the machine. Glass-making is artisanal insofar as the glass-maker furnishes the energy that dilates the initial bubble by blowing, and insofar as he regulates through the rhythm of his blowing the speed of the plastic deformation of the glass. But it becomes industrial when the energy is borrowed from a compressor.

When he borrows energy from a natural source, the human being discovers an infinite reserve, and comes to possess a considerable power. For it is possible to set up a series of relays, which means that a weak energy can lead to the usage of considerable energies.[8]

Unfortunately, the *entry of information* that comes into the work is no longer unique in the way it is with the artisanal gesture: it happens through several moments and at several levels. It takes place a first time with the invention of the machine--an invention that sometimes implies the bringing into play of considerable zones of knowledge and the gathering of a large number of human beings. It happens a second time with the *construction* of the machine and the regulation of the machine, which are modes of activity that are different from the machine's usage. Finally, it happens a third and a fourth time, first in the learning to work with the machine, and then in the machine's usage. Whereas the machine constitutes a complete technical schema, as the relation of nature and the Human Being, as the encounter of an information and an energy operating on a material, none of the four moments of information contribution is organically linked to and balanced out by the others. The act of information contribution becomes dissociated, it is exploded into separate moments taken on by separate individuals or groups. In order for the craftsman to recognize his equivalent in the industrial modality, the same human being must be inventor, constructor, and operator. However, the effect of this amplification and complication of the industrial world is to spread out the different roles from each other: not only the source of information from the source of energy and the source of primary material, but even the different tasks of information contribution. It is thus a weaker part of the total capacities of the human being that is engaged in the industrial act, both when s/he is operator and in the other roles of information contribution. The iterative and fragmentary regime of the task of the operator in industrial production is an "anatomy of work"[9] that provokes different effects of industrial fatigue. But it is also exhausting to have only invention as a task, without also participating in construction and operation. The figure of the unhappy inventor came about at the same time as that of the dehumanized worker: it is its counter-type and it arises from the same cause. To put itself at the dimension of the machine's energy entry, the information entry complicates itself, becomes divided and specialized, with the result that the human being is not only isolated from nature[10] but also from himself, and enclosed in piecemeal tasks, even as inventor. He thus encounters the discontinuous through work.

However, trying to return to directly artisanal modes of production is an illusion. The needs of contemporary societies require not only large quantities of products and manufactured objects, but also states that cannot be obtained by means of the human body and by the tool. This is because the temperatures, the pressures, the required physical reactions, the scale of the conditions do not match those of human life. The workplace, on the other hand, is a *human environment*.

It is in this very emphasis on industrial production, in the deepening of its characteristics that an overcoming of the antithesis between the artisanal modality and the industrial one can be studied with a greater likelihood of success. And this not only generally and superficially but by means of what, within the industrial organization of the production, has pushed to its extreme limits the specialized fragmentation of human information contribution: the rationalization of work through a series of methods of which Taylorism was the first.

III. VOLUNTARY ACTION: A STUDY OF NORMS

But we must cut short here the consideration of the affective modalities in order to investigate norms of voluntary action, and thus to complete this construction of the technical mentality. Indeed, the technical mentality can be developed into schemes of action and into values, to the point of yielding a morality in human environments that are entirely dedicated to industrial production. But insofar as these environments remain separated from the social field of the usage of products, insofar as they themselves remain fragmented into several specialized groups by their different functions of information contribution to machines--mastery, technicians, workers--, they cannot elaborate a value code that is capable of becoming universal, because they do not have the experience of technical reality as a whole. The technocratic attitude cannot be universalized because it consists of reinventing the world like a neutral field for the penetration of machines; constructing a metal tower or an immense bridge undoubtedly means making a pioneer work and showing how industrial power can leave the factory in order to gain in nature, but there is something of the isolation of the inventor that subsists in this activity insofar as the tower or the bridge do not become part of a network covering the Earth in its mazes, in accordance with the geographical structures and living possibilities of this Earth. The Eiffel Tower and the Garabit viaduct must be considered as the arrival of the end of the industrial concentration around sources of energy or primary material sources, that is to say not as spectacularly isolated centers and successes, but as the first maze of a virtual network. The Eiffel Tower, which was entirely designed and fabricated in the factory, and only assembled on site, without a single correction, has now become the carrier of antennae; it interconnects with hundreds of pylons, masts, and stations by which Europe will be covered. It becomes part of this multifunctional network that marks the key points of the geographical and human world.[11]

It is the standardization of the subsets, the industrial possibility of the production of separate pieces that are all alike that allows for the creation of networks. When one puts railroad tracks over hundreds of kilometers, when one rolls off a cable from city to city and sometimes from continent to continent, it is the industrial modality that takes leave from the industrial center in order to extend itself through nature. It is not a question here of the rape of nature or of the victory of the Human Being over the elements, because in fact it is the natural structures themselves that serve as the attachment point for the network that is being developed: the relay points of the Hertzian "cables" for example rejoin with the high sites of ancient sacredness above the valleys and the seas.

Here, the technical mentality successfully completes itself and rejoins nature by turning itself into a thought-network, into the material and conceptual synthesis of particularity and concentration, individuality and collectivity--because the entire force of the network is available in each one of its points, and its mazes are woven together with those of the world, in the concrete and the particular.

The case of information networks is so to speak an ideal case where the success is virtually complete, because here energy and information are united again after having been separated in the industrial phase. At the same time, the assemblages and the substructures of the industrial gigantism return in a more manageable way, in a lighter form: electronics and telecommunications use reduced tonnages, moderate energies, dimensions that are not crushing. The factory rediscovers something of the workplace when it is transformed into a laboratory. It is no longer for the individual user, as in the artisanal modality, but for the simultaneously collective and individual user—nature itself[12]—that the laboratory anticipates a made-to-measure assemblage. Such lines of pylons, such a chain of relays constitutes the harness of nature. Only the fabrication of separate pieces remains industrial. At the same time, the distance between the inventor, the constructor, and the operator is reduced: the three types converge towards the image of the technician, this time both intellectual and handy, who knows at the same time how to calculate and how to install a cabling.

Very close to the case of information networks is that of networks of *energy distribution*: electric energy is at the same time information and energy: on the one hand, it can be indefinitely paired down without a loss of productivity. A vibrator, which is a motor, can be located in the point of a tool as light as a pencil and feed on the network. A human being can easily manipulate with one single hand a 1/3 horsepower engine. This energy can, at the very moment of usage, entirely be modulated by an information of which it becomes the faithful carrier. On the other hand, the very standardization of the conditions of energy production, which allows for the interconnection and normalized distribution, turns this energy into the carrier of information: one can ask the alternative network to make function (as the source of energy) a watch whose workings it regulates as carrier of information. The simultaneous usage is concretized in the synchronic motor.

Communication and transportation networks are, by contrast, less pure. They do not succeed to reveal themselves in their true function, and the technical mentality does not succeed to make itself heard in any preponderant way, first of all because social or psychosocial inferences put a considerable burden [on these networks]; second, because unlike information or energy networks, they are not entirely new and without functional antecedents.

The railroad enjoyed a privileged situation because it was relatively clearly distinct from the road, which meant that it could develop in an almost autonomous way. In the case of these other networks, however, the social begins to manifest itself in the form of *obsolescence*, the kind of disuse that is linked to the aging of convention and the transformation of social habits rather than a wearing off or a loss of functionality of the technical object. A wagon with merchandise or a tender of a locomotive ages less quickly than a passenger car, with its ornaments and inscriptions: the one that is most overloaded with inessential ornaments is the one that goes out of fashion the most quickly.

But it is in the technical objects suited for the road network that the resistance opposed to the development of the technical mentality is the clearest: obsolescence hits the passenger car much faster than the utility vehicle or the agricultural tractor, which nevertheless are its close cousins—the car ages faster than the plane, whereas the plane has technically gone through more important transformations than the car. This is because the plane is made for the runway and for the air. It is necessarily a *network reality* before being a separate object.[13] The car is not only conceived as a network reality—like trucks—but as a social object, an item of clothing in which the user presents himself. It thus receives characteristics like the ones one used to wear on clothes and that overburdened them with lace and embroideries… these scurf-like ornaments of psychosocial life—here, they become paint, chrome, antennae. The social importance can also express itself through mass, volume, and the size of the vehicle.

To bring about the production of the technical mentality in the domain of voluntary choice, one could try to apply the categories of a common ethics of the relation between human beings, for example the category of sincerity: a car deteriorates quickly because it was made to be seen rather than to be used; the space taken up by the width of the doors is not protected against rust; the underside is not treated according to the principles of aerodynamics whereas the visible parts are abundantly profiled.

But the essential is not there, and the introduction of a dualist moral system of good and evil, of the hidden and the manifest, would not lead one very far. To find real norms in this domain, one must return towards the cognitive schemas that have already been drawn out, and ask oneself how they can respond to the exigency manifested by the pressing incoherence of the affective modalities.

The reason for the inessential character of technical objects, which is at the same time the cause of this inflation of obsolescence that has hit the population of produced objects, is the absence of an industrial deepening of production.

A car becomes obsolete very fast because it is not one and the same act of invention, construction, and production that simultaneously makes appear the road network and the cars. Between the network--this functional harness of the geographical world—and the cars that traverse this network, the human being inserts himself as a virtual buyer: a car only comes to function if it is bought, if it is chosen, after it has been produced. There is a recurrence that comes into play on the basis of this mediation: the constructor, who has to produce serially, needs to calculate the possibilities of sales; he must not only simultaneously construct the network and the cars, but he also has to anticipate this sales option. In order to be valuable, a car must be bought after having been constructed, like the Roman child who was put into the world by the mother but was only admitted to life after *elevatio*. One could also compare this alienated condition of the produced object in the situation of venality to that of a slave on the market in Antiquity, or to that of a woman in a situation of social inferiority: the introduction to active existence happens through means that are inadequate to the real functions. It takes place against entelechy and thus creates a duality, a prevalence of the inessential, a distortion of true nature: choice is made under the dubious influence of charm, prestige, flattery, of all the social myths or of personal faiths. In the inessential situation of the buyer—who is neither a constructor nor a user in act—the human being who chooses, introduces into his choice a bundle of non-technical norms. It is the anticipation, in the project of production, of the play of these norms that creates the mixed character of the venality of the industrial product, and that is the main source of obsolescence. The *distance* between the act of production and the act of usage, this lack of real information allows for the introduction of the inessential, which creates obsolescence. Because it is judged once and for all, accepted or rejected in full in the decision or the refusal to buy, the object of industrial production is a closed object, a false organism that is seized by a holistic thought that was psycho-socially produced: it allows for neither the exercise nor the development of the technical mentality at the level of voluntary decisions and norms of action.

But how is it possible to pass to a structure of the object that would allow one to draw out the technical mentality? First of all, and generally speaking, a position of ascetism allows one to get rid of the artificial and unhealthy character of social burdens, which expresses itself through hypertelic developments or developments that in reality don't function. A contemporary transatlantic liner--a fake floating city rather than an instrument of travel--slowly tends towards the recruitment of lonely, idle ones; the cargo ship is more pure. This proliferation of the inessential already takes hold of the commercial airplane: the companies flatter the traveler; the plane grows bigger and heavier. But the essential lies in this: in order for an object to allow for the development of the technical mentality and to be chosen by it, the object itself needs to be of a reticular structure. If one imagines an object that, instead of being closed, offers parts that are conceived as being as close to indestructible as possible, and others by contrast in which there would be concentrated a very high capacity to adjust to each usage, or wear, or possible breakage in case of shock, of malfunctioning, then one obtains an *open* object that can be completed, improved, maintained in the state of perpetual actuality. An electric machine that is not provided with an organ of protection, whether a fuse or a circuit breaker, is only in appearance more simple than a protected machine. When there is an overload, the system of protection kicks in, and the machine becomes absolutely comparable to what it was before the accident, once the system of protection has been returned to its initial state. This return to the initial state presupposes standardization, normalization; the more rigorous this normalization, the more perfect the machine: this is the case of calibrated fuses, or also of electronic tubes that one replaces in a machine. This is the key point: the postindustrial technical object is the unity of two layers of reality: a layer that is as stable and permanent as possible, which adheres to the user and is made to last; and a layer that can be perpetually replaced, changed, renewed, because it is made up of elements that are all similar, impersonal, mass-produced by industry and distributed by all the networks of exchange. It is through participation to this network that the technical object always remains contemporary to its use, always new. However, this conservation in a state of full actuality is precisely made possible through the structures that the cognitive schemas provide: the object needs to heave thresholds of functioning that are known, measured, normalized in order for it to be able to be divided into permanent parts and parts that are voluntarily fragile, and subjected to replacement. The object is not only structure but also regime. And the normalization of *thresholds of functioning* expresses itself in the difference between relatively separate subsets [of the whole]: the degree of solidarity is precisely the measure (in the Greek sense of "metrion") of the relation between the permanent parts and the parts subject to replacement: this measure is what defines the optimum of the regime in the relation of thresholds of functioning.

In conclusion, one can say that the technical mentality is developing, but that this formation has a relation of causality that recurs with the very appearance of post-industrial technical realities: it makes explicit the nature of these realities and tends to furnish them with norms to ensure their development. Such a mentality can only develop if the affective antinomy of the opposition between the artisanal modality and the industrial one is replaced by the firm orientation of a voluntary push towards the development of technical networks, which are postindustrial and thus recover a continuous level [of operation].

If one seeks the sign of the perfection of the technical mentality, one can unite in a single criterion the manifestation of cognitive schemas, affective modalities, and norms of action: that of the *opening*; technical reality lends itself remarkably well to being continued, completed, perfected, extended. In this sense, an extension of the technical mentality is possible, and begins to manifest itself in the domain of the Fine Arts in particular. To construct a building according to the norms of the technical mentality means to conceive of it as being able to be enlarged, continued, amplified without disfiguration or erasure. The "Le Corbusier monastery" is a beautiful example of the contribution of the technical mentality in architecture: it includes within its plan its proper line of extension, for a further enlargement. And this is possible not only because of the architectural conception of the whole, but also because of the spirit of pairing down that manifests itself in the choice of forms and the use of materials: it will be possible, without any break between the old and the new, to still use concrete, shuttering, iron, cables, and the tubulature of long corridors. The non-dissimulation of means, this politeness of architecture towards its materials which translates itself by a constant technophany, amounts to a refusal of obsolescence and to the productive discovery amongst sensible species of the permanent availability of the industrial material as the foundation for the continuity of the work ■

ARNE DE BOEVER is a member of the editorial board of *Parrhesia*.

NOTES

1. [This unpublished text by Simondon was given to us by his son Michel, to whose memory this publication is dedicated.—J.-H. Barthélémy and Vincent Bontems.]

2. [This text initially appeared in: Barthélémy, Jean-Hugues and Vincent Bontems, eds. *Gilbert Simondon*. *Revue philosophique* 3 (2006). Paris, P.U.F., 343-357. The translator would like to thank Jean-Hugues Barthélémy for bringing this text to *Parrhesia*'s attention. The text is published here in English for the first time, and with new footnotes by Jean-Hugues Barthélémy.—Trans.]

3. [W]hich has been rich in schemes of plasticity and of phase changes, reversible or irreversible. These come without a doubt from the artisanal techniques of preparation, the shaping and baking of the clay. These schemes of ontogenesis, coming from an operation entirely possessed by the human being, an operation that is continuous, progressive, and conform with the human being's scale, have encountered other schemes, themselves also ontogenetic, but including the encounter of opposed and qualitatively antagonist principles that are spatially and geographically distinct, and of a dimension that renders them *transcendent* in relation to the human being: the earth and the heavens, the hot and the cold, the dry and the humid. In order for these two realities to encounter each other, they have to be at the same scale. The nature philosophy of Antiquity comes from the encounter of the artisanal and the magical schemes of genesis, of the schemes of continuity and the schemes of discontinuity. Agriculture and nursery are indeed industries and craftsmanships, when the human being does not hold the possession of their means in hand.

4. [The French text is presented in the same way, with the sentence consisting of a relative proposition that adds an example to the previous sentence.—J.-H. Barthélémy.]

5. [This contradictory expression is used by Simondon to refer to the *overcoming of the classical oppositions* (which is what his entire thought aspired to). The "theory of knowledge" that Simondon invokes here is a theory whose task is to extend-overcome the "Copernican revolution" of Kant—who was already oriented towards the overcoming of the classical oppositions—by that which I have called, in my own work, an "Einsteinian revolution" or philosophical relativity. This entire paragraph by Simondon is of fundamental importance here, and its relation to the previous paragraph, which discussed cybernetics, extends the argument of his text "Allagmatics." In this text, Simondon presents cybernetics as a "theory of operations" that aims to "be a universal Cybernetics" (*L'individuation à la lumière des notions de forme et d'information* [*Individuation in light of the notions of form and information*]. Paris: J. Millon, 2005, 561). One should therefore be careful not to reduce Simondon's thought to cybernetics, because the universality that is targeted in "Allagmatics" imposes a double critique of the cybernetic schema of feedback and the classical conception of information. Finally, it should be noted that the text "Allagmatics" also insists on what the end of the paragraph under discussion here will say more precisely: the theory of operations is relatively independent from the ontological domains of being.—J.-H. Barthélémy.]

6. When the Boeings started exploding in flight, it was a gross mistake to judge them as "bad planes"; a more precise approach has consisted in studying the behavior of cells subject to vibrations and constraints of internal suppression, so as to determine the zones of "fatigue" of metal. A jurist, De Greef, says in *Notre destinée et nos instincts* [Our Destiny and Our Instincts] that a criminal would never be condemned if he were judged in his "nursery" [in English in the original]; this is undoubtedly because, starting from this initial phase of his life, one would consider him as *constructed*, as composed of different layers in relative solidarity to one another. The condemnation generally sacrifices something by considering the individual as a homogenous whole. This is how racism and xenophobia are produced.

7. [On this famous "process of concretization," see the first chapter of Simondon's classic work: *Du mode d'existence des objets techniques*. [On the Mode of Existence of Technical Objects.] Paris: Aubier, 1958 (with several new editions since). Simondon is going to come back in this text as well to the famous example of "Guimbal's turbine".—J.-H. Barthélémy.]

8. In a certain sense, agriculture, nursing, navigation with sails are more industrial than artisanal, to the extent that they appeal to forces that *do not depend on the human being*, and that come from a reality of which the scale surpasses the scale of that which can be manipulated. These operations introduce the *discontinuous* to the same extent; they are, eventually, alienating, and can give rise to a *magico-religious exercise of thought*. Indeed, they *commodulate the human operation of preparation and the cosmological action*. Human work remains without results, after the seeds have been sown or the ship has been constructed, if the cosmic act (rain, wind, overflowing of the river) does not come in to receive and amplify the human effort. The human effort must be in accordance with the cosmic act, and be "en kairo." In the nursing of cattle, the prosperity of the herd does not only depend on the growth of vegetables and of the regime of waters, but also on the epizooties.

9. [This is a citation of the title of a work by Georges Friedmann: *Le travail en miettes* [literally, "work in pieces"; translated into English by Wyatt Rawson as *Anatomy of Work: Labor, Leisure, and the Implications of Automation*. New York: Free Press of Glencoe, 1962—Trans.]. In *Du mode d'existence des objets techniques* [On the Mode of Existence of Technical Objects], in 1958, Simondon had extended and deepened Friedmann's reflection on the "physical and mental" alienation of the worker in a world of machines—capitalist as well as communist. The genius of Simondon was to show that the solution is not to condemn machines, but to recognize their status of a "technical individual" that must "carry the tools" and thus liberate the human being from its status as a simple assistant. Of course, the problem of unemployment that will be sparked by this simultaneous liberation of the human being and the machine means that such a progress would in fact only be possible within an *othe*r economic system, to which ecological risks, the current economic crisis, and also soon technical advances themselves—for example, the replacement of the human beings working as supermarket cashiers by machines—will *forcibly* lead us.—J-H. Barthélémy.]

10. Industry isolates the human being from nature because it takes charge of the relation human being-nature: it *is*, indeed, through the relation to the human being, which replaces the reality of the cosmic order (the wind, the rain, the overflowing of the river, the epizooty) while diminishing to a certain extent its independence in relation to the human being, but conserving the transcendence of the dimension and the character of discontinuity, of irreversibility.

11. [The notion of "key points" had appeared in the Third and final Part of *Du mode d'existence des objets technique*s [On the Mode of Existence of Technical Objects], which dealt with a theory of the "phrases of culture". The "key points" characterized there the "primitive magical unity" as the human being's first mode of being—so before any "phase shift" of this primitive unity into the *technical* and the *religious* phase. If in this text, Simondon uses the notion of "key points" again, this time with respect to the technical world itself, it is because with the twentieth century, there emerges *a new unity* which will be that of the "multifunctional network" as a unity of the human being, nature, and technology. This is also what the rest of the text leads to suggest, and one must be attentive to the fact that Simondon's valuation of "networks of information" really dates from 1968, even from 1958: Simondon was in this respect a true visionary.—J.-H. Barthélémy.]

12. [It may seem strange that Simondon considers nature itself to be a user of techniques. The rest of the paragraph explains what he means by this: a "line of pylons" or a "relay chain" are "harnesses of nature". One could object that the *use* of techniques remains *human* here, and that nature is merely a constraint that imposes what Simondon calls the "made-to-measure assemblage". The latter would then be a false point of commonality with the workmen—for in the latter case, the "made-to-measure" refers to the *user*. This is why the real reason for Simondon's proposition lies elsewhere, namely in an extension—which is absent in this case but present in other texts—of what was said *at the same time* about the "thought-network" as unity of the human being and of nature *and* about the "laboratory". This extension consists of the following idea: in the *technical whole* that the *scientific and informationalized* laboratory represents, technical reality ultimately concretizes itself, a technical reality which effectively aims, through the *instrument* of knowledge as *technical relation of the human being to nature*, to enable *the nature that is in the human being* to transform itself into a "transindividuality" that is inseparably human and techno-geographical. For the notion of "transindividual" and its link with technical "concretization", see *Du mode d'existence des objets techniques* [On the Mode of Existence of Technical Objects], 247-249, as well as the last chapter of *L'individuation psychique et collective* (forthcoming as *Psychic and Collective Individuation* with the U of Minnesota P).—J.-H. Barthélémy.]

13. [This status of the plane can be compared to what Heidegger says of the commercial plane in his famous seminar "The Question of Technology". I have myself discussed this comparison—which is also an internal critique of Heidegger's thought—in my article "La question de la non-anthropologie" ["The question of non-anthropology"] (in Vaysse, J.M. ed. *Technique, monde, individuation. Heidegger, Simondon, Deleuze*. [Technology, World, Individuation. Heidegger, Simondon, Deleuze.] Hildesheim: Olms, 2006. 117-132).—J.-H. Barthélémy.]