Culture and technics (1965)

Gilbert Simondon

The word *culture* entails a value judgement, and to a certain extent it relates to an axiological type of content.* When used with reference to human culture, its primary meaning is metaphorical, since it looks to the techniques of grain production and gardening for a paradigm of improvement and transformation, a paradigm that might have been found in a domain closer to human reality, notably in the example of animals transformed by breeding and farming.[1]

But perhaps this metaphorical detour points to a primary capacity or artfulness [*habileté*], along with a certain dissimulation, that has always underlain the notion of culture. We see that the animals bred or 'raised' [*élevés*] by man are bred above all for man; the improvement of their species is more a matter of their adaptation than of their being generally 'raised up' [*élévation*]; it may be accompanied by aspects of degeneration, by an inability to reproduce, and by fragility, which make for unflattering comparisons between animals 'raised' by man and their wild kin; the integrity of the species is diminished in the practice of husbandry [*élevage*] and other practices conducive to taming and domestication [*dressage*] – such as the castration of males. But we must understand that these forms of deficiency and degradation also exist in cultivation techniques [*techniques de culture*]; the grafted plant, producing enormous fruits or double flowers, is often as much a monster as the fattened bull, the selectively bred dairy cow, or any other sort of hypertelic dysfunction exploited as a biological specialization, whose interest lies in its productive features.

Whether we are dealing with cultivation or husbandry, the species' initial adaptation to its environment is broken, if not at least warped; a second adaptation is made, through technical means and in a technical environment [*milieu technique*], making the species dependent on the human technician: grafted rosebushes die without the gardener, and racing dogs need constant care. Cultivated species, the species raised by man, need continual technical assistance, and this is because they are artefacts; they are products of technicity. This implicit anthropocentrism, however, is less obvious in horticulture than in animal husbandry; the animal's loss of autonomy is etched in its anatomy and physiology, in features that mark its degradation more visibly than in their vegetable counterparts, if only because they are intuitively grasped by human life [*le vivant humain*]; the comparison between the pig and the boar will come out in favour of the wild species, but when it comes to comparing the rosebush with the wild rose a value judgement may lean in the other direction; only the gardener can tell us that the rosebush cannot reproduce by seed, that it dreads the frost, and defends itself poorly against the onslaught of parasites. Cultivation techniques [*les techniques de culture*], moreover, act primarily on the environment, which is to say on the energy resources at the plant's disposal over the course of its development, rather than on the plant itself, as a living individual. Such, at least, was the case for the grains cultivated in antiquity; the species' biological potential was neither diminished nor deformed. Domestication and breeding, by contrast, particularly when accompanied by animal training, presupposes that some action is taken on the living being itself, action that may result in the deprivation of freedom or in debilitating physiological mutilation.

And so we must first and foremost recognize that the notion of culture is taken from a technique [*une technique*], one that has a great deal in common with animal husbandry, but that differs from it because it depends on action exerted on the living being's environment [*le milieu vital*] rather than on the living being itself [*le vivant*]. When cultivation comes to employ the same procedures as husbandry, it, too, leads to degradation – such as we see in the methods of the specialist gardener, who grafts and prunes, reducing giant trees to tiny dwarfs, or producing varieties that flower all year round without yielding

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a single fertile seed. We could say that cultivation, the management of the environment, occasions the genesis of a second nature, while breeding detaches itself from any nature, twisting the latter into hypertelic paths, paths that lead nowhere for the species thus deflected. Cultivation respects the forces of evolution; it can even stimulate them, while breeding exhausts specific vital potentials.

Now, when the word *culture* is used today to speak of man as a cultured or cultivated being, despite the word's technical origins, a disjunction, maybe even an opposition, is set up between the values of culture and the schemas of technicity: man as technician is not the same as man as a cultivated being. Culture is a disinterested repository of values, while technics [*la technique*] is an organization of otherwise indifferent means towards ulterior ends; culture becomes a kingdom of ends, while technics tends to be a kingdom of means that must sustain a being under the authority of the kingdom of ends; culture has domesticated technics like an enslaved species [*espèce asservie*]. Whether or not he wills it, man is the technician of the human species; a form of feedback loop operates in human groups, alternately comparable to either the farmer or cultivator who prepares the soil, or to the gardener or breeder who deforms species and obtains new varieties. When the feedback loop is comparable to the cultivator who acts on the soil rather than the plant, we speak of technique: man acts on the environment he exploits, transforms and develops, and in this case man only acts on himself indirectly by means of environmental potentials [*cette charge qu'est le milieu*]. By contrast, the contemporary usage of the term 'culture' is paradoxical: the word is employed to designate the result of direct action of man upon man, comparable to that of the gardener or breeder; it remains a question of techniques, techniques for constituting collective or individual habits, or training in the various prohibitions and choices that define a psycho-social personality. In every human group, this training tends to be imposed on children more than anyone else, but there are cases in which one group imposes a culture on another – in colonization, for example, or in the processes of influence that the great powers of the world exert on countries of less elevated [*élevé*] rank that come to partially depend on them. It would therefore be more accurate to no longer oppose the word *technics* to that of *culture*: 'culture' and 'technics' are both activities of manipulation, and thus techniques. They are precisely the techniques of human manipulation, for they act on man, whether directly, in the case of culture, or through the intermediary of the environment, in the case of activities that are generally called 'technical'; such 'technical' feedback action simply possesses an additional link in its chain, the environment, which in this case is virtually the entire world, and which, imposing a considerably broader feedback delay, gives it a collective dimension that may be much vaster than that of 'culture'.

The raising [*élevage*] of man by man – which is what we should call culture – can exist in a human micro-climate, and so be passed down the generations; by contrast, the cultivation [*culture*] of the human species through the transformation of the environment achieved by technical activity is almost necessarily amplified to the dimensions of the entire inhabited earth: the environment is the instrument for the propagation of transformations, and every human group is more or less affected by the environment's transformation. We might even say that the conflict between culture and technics is above all a question of scale: so long as technologies remain pre-industrial, the transformations' order of magnitude remained intra-cultural. Each human group had its institutions, its customs, its language, its writing and its technologies, all passed on and taught in an intra-cultural manner, as an inheritance. Each people had its own way of collecting water, and built its ploughs in its own peculiar fashion; the results were more or less equivalent, and so these techniques remained intra-cultural and stationary. By contrast, the development of techniques now spills across the boundaries of human groups with different cultures, and the resulting modifications of the shared environment reach certain groups with the abruptness of consequences that are imposed without premisses. It is generally small groups that revolt against techniques in the name of culture; for the techniques are indeed the expression of the activity of more powerful groups, who influence the environment on a much larger scale, according to schemas of intelligibility without precedent in the smaller groups. This is not a conflict between culture and technics, but between two forms of technique, between a state of technique that is intra-groupal and thus intra-cultural, and a state that exceeds the dimension of a group, and therefore exceeds any possible cultural dimension, if by 'culture' we mean the ensemble of techniques of direct human manipulation that each human group employs to perpetuate its own stability. The basic phenomenon that explains the opposition between culture and technics is technology's leap beyond the intra-groupal order of magnitude, a leap

that began with the first industrial revolution. Across the world, the accusations made against technology in the name of culture are above all raised in countries that are no longer great world powers; generally speaking, cultural practices associated with ancient and particularist forms of life nourish this defamation of technologies, viewed as no more than a way of 'improving the well-being' of man, and thus always considered as eminently utilitarian.

And it is on precisely this point that the whole debate should rest: culture sees techniques as purely utilitarian, which is to say as concatenations of means. But this assessment is strictly pre-industrial. Techniques are mere means only to the extent that they remain intra-groupal, intra-cultural; to draw water, which is an end, we may avail ourselves of various means and various styles of action: a pump, a noria, an Archimedean screw, a yoked team of oxen [*manège à boeufs*], a flowing well and aqueduct… Here, techniques are closed; they promptly return to man, the user; their immersion in the environment is short-term, and the modification that they introduce is local – almost punctual, almost instantaneous. The environment's local and long-term reactions are ignored and do not become part of the culture's content; nor do they enter into the technical content, which remains relative to the here and now. One chops wood in order to stay warm, or to clear fields for cultivation, and then, a century later, there has been a change in the pattern of rainfall, in reaction to human groups; the anticipation of such vast effects on the environment, and the planning that this necessitates, however, form no part of pre-industrial techniques. When techniques outstrip human groups, the power of the feedback effect [*effet de retour*], through the modification of the environment, is such that the technical gesture can no longer be just an isolated organization of means. Every technical gesture engages the future, modifies both world and man, as the species whose environment that world is. The technical gesture does not exhaust itself in its utility as means; it leads to an immediate result, but also provokes a transformation in the environment, which rebounds onto living species, man included. This feedback action [*action en retour*] is something other than the immediate utility for which techniques are the arts of means. It goes beyond the very limits of the ends belonging to a present state of affairs, to needs that, to a certain extent, exhaust and surpass themselves [*des besoins qui s'épuisent en eux-mêmes*]. The modification of the environment that accompanies the technical gesture is generally seen as a danger, a looming menace for humanity. But there is also a positive side to this modification: the changes made to the environment modify vital regimes, create needs, and are the most powerful agent of the species' own transformation. To consciously and willingly modify the environment creates the danger of misadaptation [*désadaptation*], and requires a modification of the human attitudes that make up the content of cultural instruction, while also increasing the chances of evolution, and stimulating the human possibilities of a certain kind of progress. It is no longer a question, here, of technics as means, but rather as act, as a phase in the relational activity between man and his environment; through this phase, man stimulates his environment by introducing a modification; as this modification develops, the modified environment offers man a new field of action, demanding a new adaptation and arousing new needs. The energy of the technical gesture, having passed through the environment, returns to man and allows him to modify himself and evolve. We are well beyond utility here, and beyond any kingdom of ends: a kingdom of ends can be defined only with respect to a certain state of culture; it is intra-groupal, and, despite appearances, is always, in the last instance, a system that is closed upon an acculturated [*culturalisée*] image of man. The major technical gesture, as an act, is a wager, a trial, an acceptance of danger; it conveys the capacity to evolve, and represents the strongest and most concrete chance of evolving ever granted to humanity. In itself, it already contains an expression of evolutionary forces; it is undergirded by effort, and animated by invention – which, in the symbolic and mental domain, is the translation and perhaps the instrument of the vital power to evolve that governs the development of species. Even if techniques have neither utility nor end, they do have a *meaning and direction* [*sens*]: what they are, for the human species, is the most concrete mode of the power to evolve; they express life.

Culture becomes insulated when a human group isolates itself; it assures a stability that allows the group to survive, but if it is disconnected from its environment, if it excludes techniques, or fails to understand them, then it sustains a process of degradation the outcome of which may be fatal. Culture is a technique of survival, an instrument of conservation. By contrast, the major technical gesture is an *act of culture* in the true sense of the term: it modifies the living species' environment, and arouses an evolutionary process.

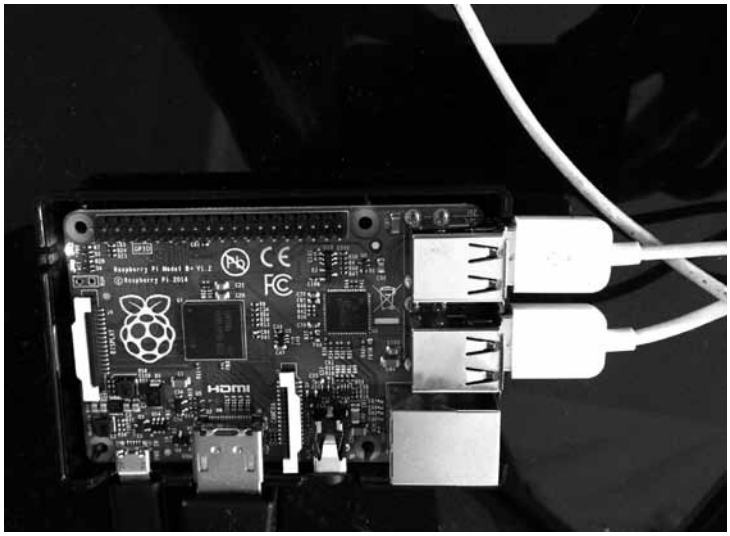
It is helpful to distinguish techniques of utility from pure techniques, minor techniques from major ones. The techniques that should be called pure or major are those which have a certain power to outstrip the here and now and act on the environment; they may extend minor utilitarian techniques, but are distinguished from the latter by their much broader scope, by a certain non-utilitarian margin, by a certain power of overcoming, and by their sense of achievement [*tournure de réalisation*], which tallies the highest possibilities, the most extreme capacities of a human group at a given moment, without any consideration to price or immediate utility. Generally speaking, these technical gestures are not justified by the needs that precede them, but only by the system of functions and needs that they create through their own existence; to a certain extent, these are gestures endowed with a power of self-justification. They have an optimization value, in the sense that they concretize the greatest prowess that can be achieved, without failing [*faillite*], with the technical means belonging to a given epoch and a given group's energetic and cognitive resources; they are perfect, in the sense that they are on the brink of failure; their value is extreme [*ils sont une valeur extrême*]. They are, in a sense, the richest concrete message that humanity can communicate to its environment in a certain epoch and under certain conditions, through the channel of technical activity. The Garabit Viaduct represents the most audacious metallic construction that could be attempted in its epoch. Eiffel had taken risks to see it through; the two halves of the arch that would span the Truyère were built starting from each lateral pillar, while still in an unstable position [*porte-à-faux*], with everything supported by cables until the moment when, having been completed, they supported one another in the centre. 'There shall be no wind', Eiffel affirmed, before the operation began, and, indeed, there was no wind. The construction of the Eiffel Tower itself represents a search for the highest, most extreme achievement that the pure use of a determinate technical mode could offer – here, the manufacture of its components in a factory and its rapid assembly, without any alterations being made on site. Utility is *secondary*, in every sense of the term: what comes first is the intrinsic perfection, the technical virtue of the constructed object; utilities come afterwards, as they did for the Eiffel Tower, which, originally an object of exposition, went on to become an aerial beacon, the support of a Hertzian diffusion antenna, and then a support for a television antenna. If the tower did not exist, they would have to construct it, but it was not constructed for utility's sake.

The pure technical intention is not totally absent from pre-industrial societies; it is contained, to some extent, in the great works of all epochs; the great works express the extreme terminus of the efforts that were possible to each epoch with the means known to them, the materials and resources available, and their level of knowledge; the great works, moreover, frequently manifest the intention of modifying the face of the world, and changing the environment, by carving through an isthmus, changing the course of water, or building a bridge across a harbour. The great works of antiquity have this character of risk, wager and defiance in the face of habits that the great modern achievements possess; at a time when the current techniques are intra-cultural, the great works manifest a certain de-framing with respect to cultural norms – and so they are generally seen as impious, insulting to the gods, disrespectful of the forces of nature, and are accused of an intrinsically dangerous immoderation: one cannot fetter the sea by throwing a bridge over a strait. In our day, great works have fallen to the level of utility; but their function as major technical acts is to be found in operations like the launching of spacecraft [*engins spatiaux*], an expression of the extreme point of the technological possibilities of a vast human group. To date, such activities still have a certain cultural content because they are coloured with nationalism, and take on a competitive cast. But we can imagine that an enterprise of great scope might demand the cooperation of all the personnel and equipment of various countries able to contribute to the project; it is already an international network of observatories that detects and follows satellites. With regard to the cultural norms of the various groups, indeed, the utility of such enterprises is not obvious, and, if one wanted, it would not be difficult to find arguments for the absurdity of these great technical acts; the launch of a satellite is absurd with respect to current utility just as a very different species, only recently having appeared in the evolutionary series, is absurd with respect to a well-adapted but more primitive species.

The apparent conflict between technics and culture is therefore a conflict between two technical levels: the pre-industrial level, for which techniques are concatenations of means in the service of intra-cultural ends, within each human group, and the industrial level, which opens technologies to a great autonormative gesture with an evolutionary

meaning that modifies the human species' relation to its environment.

This conflict imposes a decision. To seek a means to limit the technical gesture according to cultural norms is wilfully to bring a potential evolution to a halt, and view the status quo as something that already enables us to define a kingdom of ends, a final code of values. It is to consider the notion of end as final, as the most high, though it may itself be nothing more than a provisional concept allowing certain vital processes to be grasped and others to be neglected. Perhaps the notion of need, on which Lamarck based his system of vital evolution, and the related notion of nature, have a richer and deeper meaning than does the notion of end; as a system of ends, culture keeps technical activity in a state of tutelage, making it an art of means; but the power of



autoposition belonging to the technical act overcomes the closure of the kingdom of ends, and in doing so reactivates the evolutionary process of needs, and the iterative and indefinite effect of reaction between a species and its environment, which is one of the bases of evolution. Lamarck saw the progress of organisms in the passage from a state of dependence on the environment to a state of autonomy, through the organism's incorporation of actions that had formerly numbered among the uncontrollable actions of the environment; a coral affixes itself to a place where the water's motion carries a multitude of nutritional debris; all it can do is dilate by inflating its mass or retract into a defensive position; it cannot go off in search of nourishment; it cannot move the water by itself; the sponge is in the same situation of dependency; more perfect organisms, by contrast, have organs that let them travel in pursuit of nourishment, others that let them ingest their food rather than passively receive it, and others that let them breathe instead of allowing themselves to be penetrated by the gases dissolved in water: these functions are internalizations or incorporations of physical effects that had been, more or less fortuitously, achieved by the external environment, incorporations corresponding to needs and stabilized by the appearance of progressively differentiated organs. Now, the evolution of humanity through the technical gesture is, indeed, achieved along the same functional line; a certain physical effect is incorporated into what amounts to the internal environment of the human group; this effect becomes available and reproducible through the deployment of a technical apparatus, and that availability is equivalent to the incorporation of the effect into the collective organism: it is a supplementary function. Everything takes place as if the corporeal schema of the human species had been modified, as if it had dilated, had received new dimensions; the order of magnitude changes; the perceptual grid is broadened and differentiated; new schemas of intelligibility are developed, as when a child leaves his village and takes stock of his country's extent. It is not a matter of *conquest*: that notion is the fruit of a closed culture. It is a matter of incorporation, which, on the collective level, is functionally equivalent to the appearance of a new vital form.

It is therefore helpful to treat technics as activities that harbour modes of perception and intellection comparable to those that each culture gives to the individual by instruction, by means of their education. To these representational mental contents axiological contents are added that may enter into conflict with those of a given culture. But in order for this personal synthesis to be possible, it is necessary that the assimilation of these schemas not take place in two different moments, as is very generally the case: the young child, in our civilizations, receives a massive cultural impregnation at the outset, in the ethico-religious domain; a veritable *pregnation* fixes norms and basic cognitive schemas for his entire life, according to cultural contents inherited from the past; this is how his basic training is carried out, affecto-emotive on the one hand, and perceptuo-cognitive on the other. Later on, in adolescence or in adulthood, in the use of the technical objects that he must utilize, on which he necessarily brings his labour to bear, but which are not connected to him through any immediate or direct

mode of apprehension, the individual encounters schemas of intelligibility and norms, which should issue from technics and allow him to intuitively understand the new organic schema of the extended human environment, but which remain isolated from the ones responsible for the initial formation of his personality; they are unable to constitute, together, an organic reality capable of differentiation and evolution. The first condition of the reconciliation of culture and technics lies in a simultaneous encounter with the mental contents issuing from these two sources, throughout one's education; cultural education should be focused more towards adulthood, while technical education should begin sooner; in this way we might attenuate a dualism that is, to a large extent, an artefact of education.

Technicity would therefore be apprehended in a *pure* fashion, and not at the intermediary and composite level of useful objects. The object of everyday use is a compromise, often a sort of monster that suffocates technical norms beneath a cultural overload that denatures them; the nearer the object is to the order of magnitude of man, the more it is tied to everyday life, the more impure, and unsuitable for the instruction of technicity, that object is: the automobile and the household appliance are produced in a condition of venality; they are overloaded with psycho-social overdeterminations that transform them into instruments of prestige, means for escaping or dreaming, ersatz objects. They can be purified only to the extent that they are integrated into an ensemble attached to the environment of collective human life. When the automobile ceases to be an object that is made to be seen in front of a house, it starts becoming something that adapts man to the world as a network of roads, as a space having a definite configuration through which action traces its paths while modifying the world. To each type of vehicle corresponds a determinate reticulation of a collective universe. The technicity of the automobile does not lie entirely in the automobile object; it consists in the its adaptive correspondence to the travelled environment, through the intermediary network of roads; an augmentation of technical perfection is achieved through the object's simplification – better roads allow for the use of automobiles with simpler suspension and shocks, with a lower centre of gravity. An automatic telephone apparatus is simpler than a rural telephone apparatus, with its need for a magneto and local battery to place calls; technicity passes from the object to the network as the environment approximates a functional organism. We see that everyday technical objects are poor instruments for teaching technicity; they contain it only incompletely, lacking the complementary network, and possess it in a mixed state, fettered with cultural baggage. This leads us to another source of conflict between cultural heritage and technics: we cannot easily extract clear schemas and closed norms from the consideration of everyday objects; technics does not exclude itself to objects that are removed from the scale of everyday activity. It consists in technical networks tied to the world, and it exists on the two opposing levels of components and massive ensembles. The component is more universal than the object that hides it from view; beneath the apparent diversity of a great number of everyday objects we find identical components; an axiology exists, here; each component is defined by its characteristics, by its resistance, and by its performances, and is tied directly to the processes of production, and to the universal physical magnitudes of chemistry and physics. The common order of values and hierarchies is replaced by the intelligible order of the sciences. *Purity*, in particular, has an eminently physico-chemical sense. To be able to produce germanium, silicium or uranium with a high degree of purity is not just to carry out a scientific experiment; it is to enable forms of production that require us to go back, by technical means, beyond the native state of certain bodies. We process gold through the transmutation of elements to obtain a greater purity than it has in its native state. Despite its cultural triviality, flint contains one of the most precious elements for the construction of semiconductors and solar batteries; but one must extract it with a sufficient degree of purity. A very large number of technical operations consist in the preliminary processing of matter; processed matter is already highly technicized. The cultural schema of opposition between matter and form, which supposes matter's passivity, is extremely impoverished when faced with the valorization of matter that results from technical operations; matter harbours functional characteristics corresponding to cognitive schemas and axiological categories that culture cannot offer. The acquisition of these mental contents should be undertaken at the same time as the acquisition of culture.

Such an apprenticeship in technicity would assure both the individual and groups of a much vaster cognitive and axiological field. A large number of problems, such as those that arise in the relations between groups, cannot find their solution in cultural norms: since each group bears its own culture, we

are led into conflict, and while mental constructions generally cement each group's own unity, they are of no help in resolving conflicts. Technicity is a powerful educator when it comes to planning, and in the functional reticulation of an environment – and long and bloody conflicts result when situations are not adequately demystified, not objectively studied in terms of their possible planning or development [*planification*]. The employment of cultural contents acquired in childhood, like national glory, the courage of valorous exploits, or the exigency that the true religion triumph over the infidels, can only serve to keep a sane analysis of the problem at bay: culture, here, as an obstacle to the only adequate technicity, is particularly murderous and noxious; it leads to a regression, to the point where, out of utter exhaustion, one finally adopts a technical solution.

We must therefore first redress an injustice: while *cultures* do in fact exist, the existence of 'culture' is often postulated without hesitation and monolithically opposed to technics, or even to technical objects. One should give the same credence, the same postulation of possible unity, to *technics* [*la technique*], or, more precisely, to technicity, without ever confusing it with a certain category of objects, or even an ensemble of activities. Under these conditions, it is possible to make a place in human activity for both culture and technicity, and it is according to one of the most recent schemas of intelligibility, drawn from the theory of servo-mechanisms [*systèmes asservis*],[2] that we may judiciously assign each to its place, in such a way as to *optimize* the relations between culture and technics. Culture, rooted in the invariance of groups, would be perfectly adapted to the resolution of a problem, if that problem were purely human, which is to say if it were posed in terms of relations and attitudes internal to a homogeneous group. Technicity, by contrast, would be best suited to problems concerning the relation between man and the environment; but it is in fact quite rare for a situation to be completely analysed either in terms of purely human relations or in terms of action on the environment; generally speaking, a situation involves two kinds of relations, particularly when it concerns an interaction between several human groups in their concrete habitat and the exploitation of their environment. Man, to better pose such problems, must be able to conduct himself like a *regime selecting device*, which analyses data according to the mode best suited to the information received. One could say that culture and technicity are two modes of analysis, and that man must learn to treat problems according to each of these processes, extreme modes that allow him to grasp the limits of complex domains of reality. Just as a single laser beam [*faisceau*] can simultaneously trace two different curves, by the method of quantum uncoupling in a double-slit experiment [*découpage en pointe*] and through a constant movement that goes from one curve to the other in a very short time, so must man, in the face of a complex problem, perpetually pass from each extreme to its opposite, and between these two processes comprehend the expanded limits of the domain of reality. This is Pascal's method of the duality of opposing reasons, a method that supposes that we always conserve 'an idea at the back of our minds', which obliges us to ceaselessly pass from one mode of reasoning to its opposite. Culture and technics cannot complement one another while remaining in a static position; they can become complementary only through a kinematic process of oscillation and inversion, according to a regime whose appropriation or adequation to each problem is perhaps the highest task philosophy can assume.[3]

Translated by Olivia Lucca Fraser, revised by Giovanni Menegalle

Notes

1. The primary meaning of the French word *la culture* is farming or cultivation, and Simondon plays on the multiple meanings of the term throughout the initial pages of this article. When *la culture* is used here in the sense of farming crops or cultivating plants, it is translated as 'cultivation'. The term *élevage* also has a suggestive and related range of connotations: it means animal breeding or rearing, but the verb at its root can also mean to elevate or raise up.

   The term 'technics' is a rendering of the French noun *la technique*. The latter is used to denote the general domain of technologies, techniques, methods, arts and practices, at once material and cognitive, through which humans engage and reshape their environment and psycho-social milieu. For Simondon, technology per se must be understood as only a part, albeit an extremely important one, of this broader modal sphere of technical activity and relationality. When technical objects are stripped of their 'technicity', therefore, their constitutive function becomes neutralized. This is precisely the problem Simondon's philosophy of technics aims to challenge. [Translator's note]
2. By 'theory of servomechanisms' Simondon is referring to cybernetics. Norbert Wiener's cybernetic theories first developed out his attempt to develop servo-mechanical predictors for anti-aircraft ballistics during World War II. [Translator's note]
3. In the original French, this final sentence reads: 'Culture et technique ne peuvent être complémentaires l'une de l'autre dans une position statique; elles ne peuvent le devenir que grâce à un procédé cinématique de basculement et d'inversion selon un régime dont l'appropriation à chaque problème est peut-être la tâche la plus haute que puisse se proposer l'effort de la philosophie.' The phrase *dont l'appropriation à chaque problème* might also be translated as 'whose ability to grasp each problem'. [Translator's note]