

GENERAL ANTHROPOGENY

FIRST PART – BASIS

Chapter 1 – THE TECHNICAL AND SEMIOTIC BODY

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GENERAL ANTHROPOGENY

FIRST PART – BASIS

Chapter 1 - The technical and semiotic body

We could expect the anthropogeny to approach paleoanthropology as an indispensable introduction. To speak of Homo's continuous constitution, should we not first specify what we understand by Homo sapiens sapiens, archaic Homo sapiens, Homo erectus, Homo habilis, or the various forms of Australopithecus and Paranthropus, and should we not go back to the common ancestor, whose fossil we do not possess but can evaluate at 7 MY, to which all of today's mankind and chimpanzees point through their genetics, anatomical-physiology, and social behaviors.

More specifically, must we not choose between several propositions? For example, that Homo should be the result, circa 3 MY, of a continuous climate cooling east of the African Rift that led to the deforestation of the tropical forest, which, by opening up a savannah, encouraged upright primates, half-arboreal-half walker, and in the same way the development of brains and social behaviors compatible with the upright position. Or these other viewpoints underlining that already, in a half-dense forest, the upraising of the skeleton resulted from the long suspension in trees and bluff of males with raised arms. Or still, the specific embryological attention to the craniofacial contraction of pre hominid primates, creating the availability of a more reduced mouth and increased brain that was better centered on the median occipital hole of a skeleton, with short and wide ilions, that could be put upright. Some would even want that some of these embryological events should be the result of extremely-reduced mutations - three or four - of "architect" genes, determining in a male, apart from a prolonged foetalization, some of the aforementioned characteristics, which would have greatly advantaged it in such a way that, rendered very dominating, he could have communicated his mutation to numerous females, therefore dispensed, to genetically remodel their descendants, of millennia of small, hazardous mutations. Etc.

Definitive decisions on all these scenarios would prove useful to an anthropogeny. But a global overview suffices. We will therefore go forth by using the substantive Homo and the adjective hominid to cover massively, and by rounding up dates substantially, the performances of populations commonly designated as Homo habilis (2.5 MY), Homo erectus (1.5 MY), Homo sapiens archaic (200 tY or more), Homo sapiens sapiens of the Middle Paleolithic (100 tY), Homo sapiens sapiens of the Upper Paleolithic or Cro-Magnon (40 tY) until today. Without neglecting the presentiments of the various Australopithecus (3,5 MY) and Paranthropus (2,5 MY) even if the term "Homo" does not yet appear in their designation. And without forgetting the bifurcation of Homo neanderthalensis (until 30 tY), which proves very enlightening (through its contrasts and similarities) on the status of Homo sapiens sapiens. Of all this, recently discovered fossils and dating systems allow to take a rather documented view that can be found in accessible works.

Hence, for adequate dating, localizations and illustrations, the French reader may refer to the very useful book by Pascal Pick, 1999's *Les Origines de l'homme* <PP>.

We shall detail these steps of Homo on the occasion of the first ground settlements and the tool in the Paleolithic era in chapter 13. It will be the occasion to note that the Homo genus, its species and races followed straight paths and detours, alleys, short-cuts, regressions, cul-de-sac, at least compared to us, who perceive ourselves as the current culminations. Thus, for the past several years, we like to speak of bushy evolution, mosaic evolution, colorful evolution. But perhaps the very term *evolution* is too simple. Darwin resisted the term for a long time, and only introduced it in the sixth edition of *On the Origin of Species* probably finding that its very etymology (volvere, ex) suggests too much the ideas of beginning and ending, aim, progress, inferior and superior, simple and complex. Rather than *Evolution*, should we not speak of *Adapted (living) Variations*, or *Adapted varieties*, or *Compatible varieties*, by the means of either developments, or true functional bifurcations on a background of ever-new planetary situations? The variations of the living take place on moving tectonic plates, that join, separate, remodel the continents constantly and thereby create on our Earth new centers (accumulators) and flows of hot and cold, humid and dry, in a word, create these climates that have selected and crossed out all mineral, vegetable, animal and one day hominid species <21G3>.

Apart from the fact that notions of *varieties* and *variant sets* are the cream of our mathematics and logics <19, 20>, speaking of *adapted varieties* when looking to Homo habilis or the Paranthropus - locally and temporarily of course - is for an anthropogeny a way of holding on to what is observable, leaving everyone to decide on the quantity of hazard, coherence, complexity, progress or regress, or even finality or absurdity or simply of Sense or of sense, that s/he may attribute to the events of the Universe. Ulterior passages on the evolution of species <21G3> and paleoanthropology <24C3> will be the occasion to come back to this. Besides, Darwin already felt that, for the comprehension of the living, *variation* is at least as important as *selection*; since the former supposes the latter if an adaptation is to take place.

Two discoveries in Kenya further confirmed this in 2000. First, the discovery of *Kenyanthropus platyops*, presenting a very flat face similar to ours 3.5 MY ago, and then, the unearthing of *Orrorin tugenensis* (Orrorin means primitive man in Kenyan), documented by 13 fossils belonging to at least 5 monkey-like individuals and that show the femur of an upright walker close to ours and dating back to 6 MY <"La Recherche" sept.01, 28-37>.

1A. The stature

The anthropogeny may then begin with the statement that Homo's body was selected like a segmentarizing organism.

1A1. Segmentarization, cleavage and planing. Manipulation. Substitution

Here, we use the word "segment" in its etymology of "segmentum", the result of a cut ("secare", cutting). In this case, a segment is a portion of the environment sampled on neighboring portions, whether the latter are already segments or they still form an undifferentiated background from which the segments will stand out. On top of its sharpness, the cut comprises a certain separation and closure: thus segmentarization creates limitations, thence parts, and portions. Earlier animals had already torn, accumulated, but had never segmentarized or cut up. Even the superior ape breaks but does not cut. Nor does it ever cut up <1A>.

Segmentarization supposes Homo's anatomy. Hominid fingers with their very independent distal control continued the selection of primates' fingers. The thumb, opposite to the latter was progressively freed from the tasks of brachial suspension in trees, and the other fingers from their function of support to the ground (resting on the back of the phalanges for Gorillas and Chimpanzees). Thus, the stretched palm opened up a plane hand in a more widely and stable manner. This stretched palm invites smoothing surfaces, making plane portions of ground and sides of objects, which thus become faces; to go down like a flexible blade in the loose elements and distribute them into portions, especially with sand, pebbles, and grains. The concert of the fingers points, gathers, cleaves. The thumb of *Sapiens sapiens*, with its elongated phalanges, shows the selection of the pinching (strong in the thumb-mediis couple, precise in the thumb-forefinger couple), and of the smoothing when compared to that of the Neanderthal men, with their shorter phalanges, which is more adapted to more brutal grasping <"La Recherche" (R.), sept86, 1044>. The smooth and flat nails, the only one capable of some actions and representations, have confirmed these aptitudes.

Homo's delimitation faculty is even greater than its hands, in bilateral symmetry, can be placed in two facing faces, creating between their palms - strongly innervated compared with their back - a closed milieu in which the object is embraced, surrounded. Manually delimited segments are then moveable while remaining themselves. And they become *substitutable* one to the other.

We have only considered hands in a few of their determined performances, although it would be enlightening to measure their indetermination. It is the latter that first strikes the zoologist, well used to the powerful and narrow specialization of the "hands" of the tarsier, the orangutan, the gorilla. The hominid hand was a revolution over the Planet through its availability. It will make Homo the "possibilizing animal" that elaborates everything into possibilities <6A>.

The performances of the plane hands in bilateral symmetry already imply many of Homo's other performances, in such a way that "handling" and "manipulating" will spread across every domain in several languages. English *handling* goes from commerce and diplomacy to the arts, music and literature. The German derivatives of *Hand* are plentiful too. In French too, tools are "handled" (*maniés*) and consciences are "manipulated" (*manipulées*). Becoming "manifest" (*manifeste*) means being hurt (*festus*) by a plane hand (*manus*).

1A2. Transversalization and frontality. Tri-dimension from width

But **substitutive segmentarization** redoubles its powers when it has a reference system. The bodies of Vertebrates, particularly Mammals prior to Homo would distinguish (a) back and front in aggressiveness (ad-gredi, going towards) and fleeing; (b) the bottom and the top in their weight; (c) the dorsal and the ventral, in the repartition of their organs from their spine in a progressive intimacy (intimus, the most "intus"). These three sensory-motor dimensions (degrees of freedom), however, were reduced in pre-hominid animality to the predominating dimension of predation, (a): back-front, head-tail, mouth-anus, and the two others (b) and (c) were subsidiary. In a word, pre-hominid animality is rostral, better still, caudal >><< rostral.

Yet, when standing upright, and particularly when its arms and legs spread out, the upright primate's body expands and spreads a stable, transversal plan in a first while. This vertical-lateral plan is stabilized from moment to moment by gravitation, whose force field applies and planes itself along the thin upright volume of the torso. Simultaneously, dimensions of aggressiveness (back-forth) and intimacy (dorsal-ventral) confound and define a second plan, which is perpendicular to the transversal plan used as reference. Finally, under these two vertical plans, orthogonal to each other, the ground unfolds like a third plan trodden by the upright station, orthogonal compared with the two formers.

So, running along the intersections of these three plans sufficiently orthogonal amongst themselves, three dimensions activated, the three Euclidean dimensions of width, depth and height. And **transversality** - Homo's predominant and original dimension - led to this singular property of its environment: **frontality**. The distribution in width predominates in the military concept of "front" and in the political concept of "common front". The animal only has en-counters or en-rounds. Transversalizing Homo acts so that its objects and congeners "front him" in r-en-counters, spreading out the environment, from which strong and weak points emerge. Every anthropogeny must start by measuring the extreme originality of the **frontalizing aggressiveness**, which at the same time derives from the rostral-caudal aggressiveness of anterior animality and radically breaks with it.

By inserting a male hominid with arms spread out in a circle, Leonardo da Vinci, painter, engineer and cosmologist, cleared several of the anthropogenic aspects of Homo's transversality which, as we shall see, instigates the panoply, protocol, image, schematization, text, and thus the world. The text that the reader is currently reading is there, in front of him. It is both frontal and transversalized, as it has been for the person who wrote it, by virtue of the transversalizing plan of the upright station.

Upright Homo fundamentally reorganized and redistributed the three dimensions of anterior animality. In its decided height, it inscribed the antigravitational surge and the depression. In its depth: the aggressiveness of the advance and the ventral intimacy of the withdrawal. In its width: the transversality and frontality by which segmentarization is inaugurated and confirms itself. In this case, anatomy, physics, mathematics and existential dimensions are constantly being generated.

1A3. The orthogonalization of limbs and articulation

The right angle – which refers between themselves the three plans and three dimensions according to which Homo's upright body distributes its environment – invaded Homo's articulations. Homo bend orthogonally two by two its phalanges and medial segments, medial segments and phalanges, and so forth, from hand in wrist, in elbow, in shoulder, in torso, as in toes in foot, leg, thigh, torso. To which were added the 180° rotations of the head from one shoulder to the other - which means 90° x 2 - confirming the orthogonality of the three dimensions from a transversal plan. Furthermore, the upright Primate constantly maintains a circular right angle to the ground, which makes it the anti-gravitational animal. When Homo sits, its seated (*sedere*, *ad*) position creates and maintains two opposite right angles. Its kneeling, either technical or reverential, comprises one sole right angle when it uses both knees, and two right angles when it uses one knee, with or without bending the torso. Arms lifted, the threat of Primates that Homo transformed into a supplication to the heavens, confirm the anthropogenic fecundity of angles. There is nothing surprising that this orthogonalizing body should have started one day to pre-frame its images during the superior Paleolithic and to frame (*quadrare*, *carrer*) its images and its entire milieu during the neolithic era. In French, the perpendicular is said normal in the sense of normative. In Greek, *gônia*, the angle of geometry was derived from *gonu*, the knee.

All these transversalizing extensions and framing articulations of limbs demanded lockable articulations. Homo's evolution selected bone locking in the ankle, knees, hips, shoulders, elbows, and wrists. By which the hominid body became articulatory, which means that it manifested its articulations, and was thus inclined to articulate its environment, which became disposed to be technical and semiotic. The Greek root of *ar, which thematizes adjustment and adaptation, gave *arthron* for the articulations of the body, but also gave derivatives covering almost the entire anthropogenic field: the plough, ploughing, seasoning, apparatus, dowelling, close succession, the number, the count, arithmetic, exactness, recreation, virtue, precision and excellence in *ar-istos*. Through Latin *artus*, from the same root, it's a little all of this which turned around the French "articuler" and the English "articulate", which have almost as much meanings than "handling" and "manipulating".

1A4. Lateralization

Homo's transversality was confirmed by lateralization, meaning that the two halves in bilateral symmetry of its body have, at least for some functions, different aptitudes, even a hierarchy, that eventually led to speaking of right and left, *dextre* and *senestre*, or *sinister*.

Lateralization had already been selected in pre-hominid Primates that do not use their right and left hand indifferently, at least for some tasks <R.mars93, 298>. Homo confirmed this selection, as confirmed by the fossils of its dura mater that show, increasingly with time, local inequalities of blood flow, thus of cellular activation, between the hemispheres of the brain. Laterality, while creating a referential by tagging left vs. right (that we find in the most abstract mathematics), and even a polarity left >> right or right >> left, could only comfort the technical privilege of the width (transversal-frontal) by putting it under tension. Lateralization completes

the Primate into an obstinate (stare, ob) animal, which means standing (stans) against (ob) all the odds.

If we come back to the plane hands, we see that they summarize transversality, orthogonality and laterality, as well as the segmentarizing capacity. Indeed, when they inscribe their plans anywhere in the transversal plan of the body, or in any of the parallel or normal plans compared to that plan, and better still if they exploit their capacity of rotating on the wrists, elbows, shoulders to determine more or less orthogonal plans compared with the basic transversal plan, they offer the segments they manipulate and handle a referential allowing them to refer amongst themselves and to compare themselves frontally in many different manners.

However, if each one of Homo's hands develops a space with three translations and two rotations, which equals to five dimensions (metiri, measure, dis, by disjunction), meaning five degrees of freedom, and if other articulations and dimensions are still added on when we go back up to the elbow and the shoulder, like topologists have insisted (Poincaré, Thom), only three of the seven or eight dimensions proposed prevailed for the hands as for the entire body. This precisely because of the prevalence of the transversalizing and lateralizing width and the subordination of the height (up-down) and the depth (front-back), as merely adjoined dimensions.

1A5. The step, the walk and the rhythm. The eight components of rhythm

Other animals move, sometimes playing, sometimes proceeding to goals, the “goals” of etiologists. Only the upright station, with its three orthogonalized dimensions and the pivots of the two heels, inaugurated the walk, and even the gait, the prefix of which in French "de-" [de-marche] signals distance and even the introduced distancing. Pace is not a simple translation back-front and does not target speed as such (Homo moves slower than its ape cousins); it is precisely the promotion of Homo's transversal plan going on the encounter of frontal plans. When it bifurcates, the walk is not completely absorbed by the path taken. Transversalizing, it remains available to all paths it did not take. It opens paths.

Moreover, the biped step, with its muscular saliencies, firmly distinguishes left leg and right leg, motionless leg and moving leg, resting leg and hanging leg, i.e. gravitational and anti-gravitational moments. Other back-and-forths inhabit Homo's body, like those of the cardiac systole and diastole, the respiratory expiration and inspiration, but these to's and fro's do not have the same opposite evidence, the same ostensible kinematics or dynamics.

Thus, the pace comprises “the one THEN the other”, "the one AND the other", "the one OR the other", "the one IF the other", and predisposes to the logical synthesis: consecution, association, disjunction, condition. It implies a choice, particularly the simplest of all: the binary choice. Its degrees of freedom are maintained from the fact that moving in upright position only supposes low energy expenditure; one loses little weight walking. From Homo habilis to Homo erectus (ergaster), the hominid body was selected to complete ever-longer walks, and thus increasingly exploratory, with the allostatics that this implies. The increased distance between the pelvis and the thorax, the remodeling of the two (short and narrow hips, barrel-shaped rib cage), the articulation of the shoulder going down and allowing to counterbalance every advance of the alternate leg have created (a) a pace that drags less the totality of the body with each step, (b) a

vast and equal breathing, (c) the accelerated evacuation of heat through the epidermis, which has become hairless, exuding and ventilated, (d) an organism offering a reduced surface to the vertical solar radiation.

All the properties of the step come together in the **rhythm**, characteristic of Homo, deriving from the Greek "HrutHmos" that simultaneously means: flexibly regulated repetition, cadence (cadere, fall of the step), manner of being, character, form, gender, within the framework of the orientated flow (reïn). A sufficient enumeration of the aspects of the rhythm is essential to the anthropogeny, and we should attempt it from here.

1A5a. Periodic and metronomic alternation

Bipedal and persevering, the walk does not content itself with repeating steps, but it alternates them, meaning that one engenders another, and precisely the other of the two (alter), before returning to itself. The alternation is specific insofar as it maintains the Same through the Other, an opening to the Other without loss of the Same, which results in the fact that the identity engenders otherness to return to identity. It is normal, normative, metronomic (metron, measure, nomos, sharing), and thereby one of the sources of the number, ordinal first, cardinal after.

However, it does not repeat itself identically while maintaining itself. And the pace, while regular, regulating, triggers numerous degrees of freedom, to the creation of veritable temporal dimensions. (Strict mechanic metronomic was a transitory historical phenomenon having supposed the exaltation of the European clock industry in the 18th century.)

1A5b. Interstability

This combination of identity and otherness, or more generally of similitude and variety, results in the fact that the step is neither stable nor unstable, nor is it metastable, and could be qualified as inter-stable. Physicists would say that it is an ex-cited state (citare, frequentative form of ciere, putting in a quick movement + ex). Ex-cited obviously making a couple with in-cited.

1A5c. Accentuation

The walk can accentuate itself, because its equilibrium, which is alternating, inter-stable, excited, incited, and over and above polarized by Homo's general lateralization invites Homo to mark one step as laying, leaning (thesis), and the other as lifting (arsis), in a beat or a cadence (fall), according to the accentuation, which is a general principle of any nervous system. Then to foment a second-degree alternation, in a three-beat break: left thesis / right arsis / left arsis // right thesis / left arsis / right thesis / ... Unfortunately, we do not know whether the etymology that gives accentuate as a descendant of ad-cantare is exact. Other differentiations also arise depending if, in each leg, one privileges the beat, the thesis, as we find in classical music, - whence the word cadence (cadere), - or rather, the lift, the arsis, as yesterday's and today's Greek dancers do.

1A5d. Tempo

The step not only allows for varied speeds, rapid, average, slow, like the animal hunt, but allows for contrasted and graduated speeds according to paces (manners of going) that are either flowing or jerky. Through its designation of tempos, classical music will show that they are not without relation to existence attitudes: sostenuto, andante, adagio, allegro, staccato, rubato (stolen time).

1A5e. Self-engendering and suspense

The walk self-maintains itself insofar as every step restarts the next step, then restarts itself, in the circuit of a kinesthetic perception referring to a motivity, which in turn sends back to kinesthesia. This is apparently only a simple "Baldwin reaction" at the service of perseverance, but which this time enriches from the calls, which are alternation, inter-stability, accentuation, metronomic and tempo. Circulation amongst alikes, opposites, contraries, contradictories, the self-engendered rhythm, not only drives but also comprises some form of suspense (pendere-sus), a means of stopping whilst announcing continuation. Activating time in a way that cancels it. Re-launching it or extending it into eternity.

1A5f. Convection

The hominid brain, like that of other mammals perhaps, not only perceives movements but motions, i.e. movements that are grasped as emanating from forces, that it evaluates as such and that drive it along. Thus, bipedal walkers, from the mere fact of feeling at one with others, stimulate each other according to a flexible and constraining perceptive-motor gravitation, coordinative, which has a considerable social role. Even before launching and defining dances.

1A5g. Strophism

The elementary unit of the step by step, alternating, inter-stable, accentuated, accelerated-decelerated, proliferates and regroups itself after a time in larger units, which in turn alternate, transpose, turn around, topple over according to diverse symmetries. Such is the strophe (strephein, turning, wring, coil), first kinesthetic, then visual, audible, etc. From that of dance to that of poems and songs.

1A5h. Distribution by cores, envelopes, resonances and interfaces

Finally, the gravitations that the walker exerts on others also works inside of him. Transversalizing an organism, the walk condenses **cores**, models **envelopes**, triggers **resonances**, opens and closes **interfaces** in many distributions and animations that dance thematizes. We will

return to these moving distributions on the occasion of the general articulation of the hominid specimen <11F>, and the internal convections of its textures, images, languages, writings <13 to 18>; western music will show us Bach organizing his rhythm from cores, Mozart from envelopes, Beethoven from resonances, and Wagner from interfaces <15G3>. But the profusion of thus-created singularities is so considerable that we shall only truly measure it in the last chapter of the *Anthropogeny* <30>, entitled the galaxy of X-selves.

Totaling these eight characters of the rhythm, we can understand that the most touching documents of paleoanthropology are the traces of steps of two walking specimens, one larger, the other smaller (difference of gender or age?) that, 3 MY ago in Laetoli in Tanzania, were imprinted in the ashes dampened by rain of a nearby volcano before being covered with new volcanic ashes to form a layered tufa rock until erosion progressively re-opened the upper layers and showed the primitive imprints to the team of Mary Leakey in 1976. These direct or collateral ancestors of today's Homo already show the anterior widening of the foot, big toe directed to the front, rounded heel and the indication of a plantar arch.

In front of this stride, we should also like to know who, out of Homo habilis, Homo erectus, Homo sapiens sapiens - after having moved forward, walked, hiked - first dared to dance and to really stroll, according to this very particular dance, the wander. Homo is the animal that wanders; or simply strolls (minare, chasing, pushing, pro-, in front), as we have already said.

The walk considerably added to the manipulation of symmetrical plane hands. Casually, the walk led Homo to all the sites where handling and manipulation was adapted to them. But also, secretly, the walk transmitted its own arsis (lifting) and thesis (pose), inviting them to act in pace in turn, according to a regularity with a game, an alternation, a swing; the drummer beating his foot knows that the binarisms and ternarisms created by his arms and hands come from his feet through his legs and hips. When Walking homo started producing choppers then hand axes (circa 0,5 MY), the rhythmic clapping of its hands, or simply their cadence, their manner of lifting and falling onto the stone, could only reinforce transversality and lateralization. Thus also the orthogonalizing tri-dimensionality with its technical, mathematical, logical and existential consequences.

What precedes is perfectly summarized in the Indo-European root *st, omnipresent in stature, stare, sistere, Histanai, stehen, state. With all that it implies of frontalized, controlled and lateralized emergences, expansion, tri-dimensional distribution, virtually multidimensional distribution. Anatomists estimate that the body of today's Homo enjoys more than 200 degrees of freedom, or dimensions, - by which it is impossible to find a complete writing of Homo's dance, but only a stenography <18I6>. Regardless of the exact number, it is considerable, and renders Homo's stature a hotbed of plural physical freedoms, that will one day support mental freedoms and sometimes a simple feeling of freedom.

1B. The *woruld (wereld, world, Welt)

To designate the environment as itself being coupled with the stature and organism of Homo, the German archetype *woruld, from which comes the Dutch "wereld", the English "world", the German "Welt", is rather fitting. It seems that it originally targeted hominid existence in its generality, i.e. coupled with Homo's milieu; then this milieu itself, but always insofar as the hominid existence thematizes it as environ. Conversely, the Greek "Cosmos" and Latin translation "Mundus" (world, not no-world), both send to the notion of order, even preliminary order, which seems too narrowly western to fit for the anthropogeny. We shall keep *woruld and will detail its aspects.

1B1. The milieu as panoply and protocol. Tool and utensil versus instrument. The collection

Homo's transversalizing stature triggered the **panoply**, a set of "things" grasped more or less simultaneously according to frontal plans, where they stand out from the back but also appear as complementary and substitutable. The environment, having become a set of panoplies is the first aspect of the *woruld, from where the others ensue.

The "display" (plicare, dis, unfolding) of the panoply is consistent with the **protocol**, meaning regulated sequences of operations, the moments of which are also substitutable, in the elaboration of a meal or the weaving of a fabric. The protocol is to the duration what the panoply is to the extent. From the moment when Homo juxtaposed or made a suite of two, and especially of three "things" on the ground or in its hands, - "3" is necessary to setting relations in motion, will say Pierce, - their substitutability articulated several "before", several "after", several "at the same time", sprouts to what will become later recognized successions of states, perfective/imperfective, past/future/present, or still, average/thin depending on the cultures. The protocol supposed hominid transversality, even laterality. The behaviors of monkeys, for example in food matters, evolve by change of processes (of rituals, say etiologists), not by change in protocol.

In the same time, the **instrument**, handled and manipulated in this outlined duration and already active for animals, becomes **tool** or **utensil**. The term instrument (struere, in) is general enough to apply to the prehensile stick moved by a monkey, to the stone pushed by an otter to break an egg or by a chimpanzee to break nuts, to the needle lengthening the beak of a woodpecker to catch a worm under the bark, to the nest and the burrow under construction, so many complements of animal bodies in a close coaptation. Conversely, the words "tool" and "utensil" come from *uti*, a Latin verb limited to hominid performing, and they designate instruments articulated in panoply or protocol. It is not enough that an instrument should be used several times, like sometimes the monkey's stick, for it to become a true tool. (Thus, it is risky to affirm that Paranthropus, a sort of Australopithecus robustus, invented the "tool" before or at the same time as Homo habilis <R.mai95, 568>).

The panoply and the protocol have played decisive roles in the identification of **things** (causes), by opposition to the identifications of preys, food, and partners in the animal. It does not matter to the cat to hunt-kill-eat "mice", but only to recognize by smell from a distance the odorous combination X leading it to get close to a certain combination of movements Y, linked to that X; from where, its vision takes over its smell, and dark forms of such height and such movements trigger in the cat and its prey some moves that will lead to the capture of the mouse. This is here the order of stimuli-signals <4H>, where at any moment there are no "mice" in the sense that hominid specimens will understand. Because only transversalizing, orthogonalizing, lateralizing primates will build (nervously) this panoplic and protocolled representation that will be handled and manipulated as a "mouse". Even the chimpanzee does not need "things". Neither does it need states of things (Sachverhalt). Or facts. Panoplic and protocolled, combining the tool, the utensil and the instrument, Homo is a collector (ligere, cum). The **collection** will vary depending on cultures and eras, but we shall find it everywhere, and from childhood.

The four terms of tool, utensil, panoply and protocol are so characteristic of Homo that an anthropogeny would do better to tighten their etymology. The tool has a sliced and salient use, the utensil has a pervasive and pregnant use; symptomatically, the former derives from the Latin *uti* commonly, the second scholarly. The panoply, complete armament (Hoplôn, pan) of Greek Hoplitēs, signals the supremacy of war over peace; for Homo, weapons are tool-utensils par excellence. As for the very diverted etymology of protocol, where succession is rendered by the idea of recipe, itself signaled by the first stuck sheet (kollân, gluing) that bears the table of contents of a document, it betrays how much the duration is less obvious than the extent for Homo.

1B2. Situation vs situs. Circumstance

Tools and utensils, because they apply to things (causes) sufficiently segmentarized, transversalized, lateralized, substitutable, complementary and because they are all of that, determine a **situation**. The strength of this word is clear when it is opposed - as is possible in French - to situs. Any being of the Universe, whether mineral, plant, or animal, through the range of performances that it is, opens and maintains a **situs**, which means an ambient extent and duration through which it is discernible (Leibniz). Very pertinently, the Latin *situs*, which is the verbal substantive of *sinere* (laying), from the same family as *serere* (sowing), marks a certain place and at the same time a duration, until it may mean ruin. Yet, every performance of Homo not only sets up such a situs, but further inaugurates a veritable **situation**, where the final "-ation" signals that, resulting from the frontalizing stature, the position of a situs now becomes a stand [*prise de position*, in French], and even a risky stand amongst complementary and substitutable elements. To the extent that the hominid thing-performance-in-situation almost always occurs in a **circumstance** (stare, circum).

1B3. Things-performances-in-situation-in-the-circumstance-over-a-horizon

Thus the horizon develops, the *Horizôn* (*kuklos*) noted by the Greek, the limiter circle, both closing and opening, one of the existentials of Homo (Heidegger). In fact, the horizon is there as soon as there is transversality and frontality. But the panoply, the protocol, the situation, the circumstance precise its sense, because they mean that every hominid grasping ends in substitutable "forms" on a "background" that is also substitutable, and that every form refers to other forms, every background to other backgrounds, indefinitely. This is what creates the paradox of the horizon, which is a traced limit (*Horidzein*, limiting), and always put back further or elsewhere for the very reason of its tracing by things (causes). The two senses are thus conjugated when one states that, over the ocean, the optical horizon of Paleolithic Homo measured approximately 40 kilometers, and that Homo had to wait for its *techno-semiotic horizon* to target and reach the Great Australia (Sahul), separated from Asia by the Wallace line, measuring 70 kilometers.

All actions-passions and states of Homo thus concern *things-performances-in-situation-in-the-circumstance-over-a-horizon*. This formula - heavy yet necessary - will be a constant key for the Anthropogeny, whether to understand the functioning of the image, dialect, writing, logic, or music.

1B4. Technique vs. Nature. Technemes

Let us see once again the anthropogeny proposed by languages. The Greek *tekhnè* encompassed everything from elementary manual activities to consummate art and skill in the works of the mind. Similarly, in French, the word *technique* covers the activities that use tools and processes, but also these very tools and processes, or at least what they produce, and thus extends to maintained forests, to rivers crossed by fords and bridges, to areas of culture and harvesting, to the hominid body distributed in panoplies of organs (more anatomic) and in protocols of systems (more physiological), giving way to "images of the body" that differed greatly according to cultures <11D>. If nature is often perceived as what has not yet been (too much) touched by technique, we can see just how close the nature/culture border is blurry. The reciprocal overlapping of the idea of nature and the idea of technique even complete the idea of horizon, each being a horizon for the other.

The extension of the notion of technique demonstrates the intimacy that exists between the handling with the tool and the handled tool. And the anthropogeny will thus avoid two common affirmations: (a) technique is "the prolonged human body"; (b) technique is "a means at the service of mankind". Because it is for the rostral-caudal body of animals that the instrument is a prolonged body, not for Homo's transversalizing body, which places it frontally in panoplies and protocols. On the other hand, the tool and the process surround the hominid specimen so much from all parts that Homo inhabits them <3B>. For Homo, technique is the first milieu; it is neither a means nor an end. It constitutes it literally. As functionings, Homo *is* its techniques and its technicized body. We shall simply have to add later that he also *is* its signs. The technical "molecules", which we can call *technèmes*, are units that are both objective and subjective.

1B5. The size of the technician body

As many naturalists have demonstrated, the size of an animal species is a compatibilization between its interior and exterior milieu, or ecological niche. Hominid *woruld, with its things-performances, situations, circumstances, horizon, supposed a body of defined dimensions and weight.

We don't know much about Homo's successive sizes, particularly because paleoanthropology only finds fragments of skeletons. Thus, we sometimes hear that the Laetoli bipeds dating back to 3MY were 1,20 m and 1,40 m respectively, size calculated after the size of their feet. What we know for sure is that the almost-complete skeleton of still (bracchiatrice) pre-Australopithecus "Lucy", dating back 2,3MY, was 80 cm high, and that the first complete specimen of Homo habilis, gathered in 1986, is under a meter. The size variation of current population warns us that it would be presumptuous to draw hasty consequences from fossils, even complete, of which we don't know with any certainty the age, sex or aberrance in the group.

Thus, we are reduced to generalities. Hominid females were probably often smaller than males, with usually shorter legs compared to the trunk, seeing the advantage of carrying the foetus as low as possible without compromising the advantages of the walk and the run. Similarly, Homo's stature had to be selected according to the benefits of a vision that would be sufficiently guiding, as well as arms and hands optimizing, through their length and their angles, the capacity to strike, convey, treat preys, materials and usual tools. Arms sufficiently long to reach excretion and copulation organs; short enough to continue enjoy optimal distal control of the fingers, these fingers that will later play the piano and the violin.

This techno-semiotic adaptation of bodies is behind the vocabulary of old measurements: inch, span (of the hand), yard, fathom, stride. Even the meter, as artificial as it may seem at first, was reasonably adapted to the measurements of the bodies of workers in the 19th century.

1C. Integrating senses

The animals' sensory system shows well the interfaces that they are between an interior and an exterior milieu, particularly concerning the transfer of information. And indeed, four types of signals are economically available in the terrestrial environment. (1) Chemical properties, which selected taste and smell. (2) Mechanical properties of pressure and displacements, which selected touch. (3) Sound waves and aquatic waves, which selected hearing. (4) Electromagnetic waves, which selected sight. An anthropogeny must see the party that Homo drew from this phylogenetic suite. In Homo's case, it would be traditional and convenient not to follow the order: taste, smell, touch, hearing, sight, and to start with sight and hearing insofar as Homo is a transversalizing animal.

1C1. The embracing vision

Homo's sight, like that of any animal, responds to survival imperatives. Pre-hominid primates has to move high in the trees on thin branches and therefore selected a sight that would grasp the relief, thus also parallel visual axis and a clear (not blurry) vision of colors. We can see the party that Homo drew from its origins. Distinguishing textures also proves indispensable to an omnivorous harvester-hunter, adding to the fact that textural distinctions probably intervene in its choice of sexual partner. Furthermore, the upright primate is a manipulating worker, which supposes a sight that is both globalizing and detailed to perceive its tools and materials transversalized in panoplies and sequenced according to protocols. Technique even activates a geometrizing vision, which engages a sensibility to variations of curves, to the contrasts of plans according to their shadows and luminosity, their more/less textural details, and an aptitude to reduce the multiple to the simple. This calls for a view from which emerge the parallels, and therefore also the parallelepiped, stairs effects, cylinders, cones, spheres, or more initially the balls used as a starting point by topologists.

1C1a. Balance between sampling and globality

These combined requirements selected - or continued selecting - a sensitivity to the most active electromagnetic waves in the terrestrial environment, i.e. those for which the wavelength fluctuates between 400 and 700 nanometers, privileged for a sun of 5800° K in surface (Weinberg, *The First Three Minutes*).

Also selected was trichromacy, i.e. a retina enjoying three types of cones, said "red", "green", and "blue". Dichromacy would suffice to ensure a good grasping of textures and an average vision of colors. Mammals are dichromatic, as were the Primates of the New World who live in the canopy. Conversely, the Primates of the Old World, living in a milieu that was less covered, that was more open, progressively had a selective advantage to enjoy a finer perception that was also more globalizing of colors, and were selected trichromatic. Appearing in the Old World, Homo continued in this respect, particularly that trichromacy was suited to technical manipulation.

For trichromatic Homo, it's the difference between the preferential receptions of "red" cones (565nm) and the "green" cones (530nm) that ensures the perception of textures or relief, by preventing the univariance (where the variation of a wavelength and that of an intensity become indiscernible when they compensate). "Blue" cones, thus freed of the textural function that they enjoy in dichromatic, only extend the distribution of colors, which does not suppose that they are numerous (5-10%).

Let us insist, what matters to the anthropogeny is not the raw number of receptors, not the diversity of recognized electromagnetic wavelengths: pigeons are pentachromatic, and even sensitive to ultra-violets; some female monkeys of the New World are trichromatic, probably for the evolutionary advantage of recognizing red berries over a green background; some hominid females seem to be tetra chromatic, even pentachromatic, due to the genetic fluency of green and

red genes on the chromosome X <R.janv95,29>. What is important is that for Homo, colors, with their precisions and imprecisions, seem to give a result that is globalizing, balancing, frontalizing, transversalizing, like the hominid stature and frame. In these matters, there are only compatibilizations: the little gap of wavelength (35nm) between green cones (530nm) and red cones (565nm) results in a loss of the color sensitiveness, but if it was any greater the "greens" and "reds" would give focuses that would be too different and that would provoke chromatic aberration.

Therefore, is there an objective foundation to the phenomenology of colors? This is assuredly linked to matchings that vary according to cultures: the "mystical" blue is linked to the sky, the "hot" red is reminiscent of blood and fire, the "resting" green recalls greenery, while the "ambiguous" yellow evokes the sun and a sallow complexion (*rire jaune* in French = sour laugh). Yet, a basal phenomenology perhaps stems from the disposition of the cones: blues, with their high frequency and low texture, seem "cold"; conversely, low-frequency reds, textural and enveloping, seem "warm". Greens, which are central in the prism, would be "neutral" (thus excluded by Mondrian). The ambiguousness of yellows would be favored by their hesitation between red cones and green cones, the preferential receptions of which only diverge by a few mere dozen of nanometers.

The field of view must still be considered. Already wide for the great apes, it is even wider for today's Homo, to whom the environment offers itself up to the horizon like a quarter of a sphere, when Homo's eyes with parallel axis (following the general invention of primates) are only turned to the front; like a half-sphere leaning on the plan of the plane ground, when Homo's eyes and slender neck exploit the entire lateral mobility to direct its circular sight in front and behind.

Thus, in every respect, the sight of standing or seated Homo globalizes, makes a globe, is *global*, both literally and figuratively. Yet without stopping to be *punctual*, sliced, cleaving. Things (causes), referred to the width (transversality) as predominating dimension, and referred at the height and depth as subordinated dimensions, were doubly confirmed in their quality of *world (the milieu as appropriated by Homo), and even opened one day to the idea of cosmos-world (general order), then of universe (versus unum).

1C1b. The taking of a point of view and the angularity

By the same token, Homo introduced the point of view into the Universe, and more precisely the taking of a point of view, because of its standing position and slender neck capable of extremely controlled movements, i.e. progressive and smooth, which allowed Homo to regulate and block the starting points and angles of its sight.

Thus, the rectilinear nature of light rays could be fully exploited. Taking a point of view allowed (a) to organize a landscape according to vanishing lines; (b) to verify infallibly the flatness of a plan over hundreds of meters simply by scanning it visually from one of its points by sticking one's temple to it; (c) to vary and calculate angles exactly. Thanks to its *perspective* and even *projective* eye, Homo was going to obtain from its environment a gripping that would not only be geometric, but geometral, susceptible of restoring the size of objects independently from perspective.

1C1c. The processional effect

Consequently, Homo's promenades and strolling in a forest produced the calculable and progressive sliding of the trees in a second plan behind those of a first plan, and in front of those of a third plan. Like later the calculated sliding of a simple or double colonnade in front of the main body of a building. And the sliding of any collection of objects under the effect of a translation or rotation, either of the set or of the viewer. This effect, which will become cinema's main effect <14I3>, found its primary exploitation in the architectures and ritual processions of primary empires. It will be suggestive to call it the processional effect.

1C2. The proportioning hearing waiting for an echo

In agreement with this globalizing and articulating vision, thus synoptic, hearing was selected as proportioning, transversalizing in its own way. One day, as technically manipulated materials started emitting tones <15A-B>, i.e. held-tense sounds (tonos) and when Homo's voice was capable of doing the same, hearing started distinguishing intervals of octave, the quinte, quarte, major and minor tierce, as well as grasping the timbres by capturing the relative number and intensities of partials (harmonic or not) of a fundamental tone. It is still hearing whose selection will reinforce the capacity - essential in language - to perceive the attacks and brisk breaks of a tone, as well as some sound formants sufficient to make it an oppositive event.

Today, Homo's increasingly proportioning hearing has retained frequencies ranging between 20 hertz and 18000 hertz. Because hearing up to 40000 hertz like a dog, and up to 60000 hertz like a cat would have parasitized the panoplies and protocols of the technicized environment, particularly the fine tuning requested by the manipulation of tools, and then by the language, which rather supposes acuity peaks around 2000 hertz.

As for the aptitude of Mammals and Primates to spread out sounds according to the front/back and up/down axes, it was obviously maintained, but always at the service of globalization. Homo no longer has the twenty or so muscles that run the horse's pinna towards sources that are each unique and separate. However, at the service of its transversality, its hearing exploits fully the differences of time and intensity of the different waves of a same sound that reaches its two ears differently in stereophony. One day, Homo will be capable of dominating frontally (transversally) a symphonic orchestra, in the same way that its sight dominates frontally (transversally) a painting or the page of a book.

A major consequence of this hearing was the expectation for an echo produced by the voice or any other object. Because of the delays between its start and return, the echoed sound comforts all eight properties of rhythm <1A5>. Then it makes a loop, it creates a closed world and, for upright Homo, thence solitary, the sound closing was probably an initial protection. The mumbling of the sick or the abandoned lives of echoes. Childhood language also begins by doubling: ma-ma, nou-nou, pi-pi; and the Japanese spoken by adults too. Besides, the echo triggers the distant as much as the nearby, and confirms Homo as an animal not only at a distance but also in distanciation <4A>. Its duplication will eventually lead to logical reduplication, i.e. to the being as a being. It is

precisely the Greeks, who created the logical particle "Hèĩ" (whence, as a), that made of Echo, the listening one, a nymph of the clapping of sources and the rustling of forests, and the complementary lover of Narcissus, the visual one, enamored with her face.

We know that the hearing sense and the vestibular sense (with its semi-circular canals that register the relative and absolute movements of the head) occupy the same anatomical site. It is not a sufficient reason to conclude that they would have an immediate functional relation, and that the activations of the one would provoke the activations (adjustments) of the other, linearly and circularly. In neurophysiology books, "Hearing" and the "The Sense of Balance" are two separate chapters. However, some recent studies would tend to conclude to a certain circulation. If these conclusions confirm, they would allow better understanding the relations between music and dance <15B12>, each inducing the other, to the extent that they are often completed together. They would explain the overall well-being and activations obtained by some productions of sound (background music in shops and places of work), and also the fact that music has often been used to educational and healing purposes (Pythagorean acousmatic). The audio vestibular tract would thence be an essential home for integration and integrity (integer, complete, healthy) of Homo, according to a reciprocal comforting of the balance of the upright position, the gesture, the voice, the sound instrument and of all the kinesthesia and coenesthesia.

Confirming the idea of a globalizing hearing integration, each ear is connected to the auditory cortex in both brain hemispheres, with the most important connections situated in the contralateral hemisphere. On the other hand, the circular control between hearing and sound production is on its way since at least the birds.

1C3. The palpating, constructing and caressing touch. Caloric and algescic sensations. Proprioception

What we vaguely refer to as the touch is, since pre-hominid animality, made up of nerve receptors delivering various performances, the ones more sensitive to superficial pressures, the others to deeper pressures, others still to the cold, others to heat, others to pain, and others ensuring postural and motor proprioception. Despite these different receptors, the sensory neurons are the same (dorsal root ganglion cell) and we now speak globally of *bodily senses*.

For Technical Homo, the whole of this system was selected in a way that the very differentiated distal commands of the fingers should allow to discriminate and realize directions, lengths, structures, but also textures, such as grains and wefts. In this way, the hominid hand became capable of palpating, i.e. producing a combination of sliding, rubbing, probing, angulation ever more effective that it is situated in the fixed and orthogonalizing referential of the wrists, elbows, and shoulders, osseously lockable.

Palpating, prepared among the Apes through their capacity to circulate amongst thin branches, then refined by delousing, also became not only structural and textural, but also an allusive, elusive tact that proved pervasive through its insistence, apt both to caresses and to technical evaluation and construction. Hominid touch cultivated a sort of internal distance right down to its grasping, ignoring simple preys and mere spoils. Condition for Homo to become technician one day, since the rostral-caudal predation and transversalizing technique have two

different, almost opposite, polarities. Even if the second is built on the evolutionary base of the former.

Touch is a good occasion to signal from the start that Homo's sensory systems are evolutionary and multi-factorial <21G3> too, biologically and above all culturally. For example, we shall have many occasions to come back to the fact that an ancient Greek does not "touch" in the same way as a Roman-Catholic-Jew: the *haptēin* (haptics) of the former is very exterior, kinesthetic, adjusting, exotropic. The *tangere* (tactile) of the second is penetrating, insistent, already very caressing, almost sniffing, endotropic. Complete anthropogenies of the touch, sight, hearing, smell, and taste would have to demonstrate every time what is quite fundamental and permanent, but also show the cultural specializations and restructuring of senses.

It was to be expected that, regardless of the culture, Homo's upright, transversalizing, orthogonalizing, lateralizing stature should have developed - by combining the mechanoreceptors of the skeleton and the articulations - a "sixth sense", a both global and differentiated grasping of the body, with its organs and systems, resulting subjectively in a "body image". This sense is so fundamental that it was recognized from the early beginnings of neurophysiology by Sherrington, who called it **proprioception** in 1890. Some polyneuritis altering or suppressing this body image show, by the nonsense that they trigger, how essential it is to the constitution of a consistent posture and singularity.

1C4. The pneumatic breathing and planing smell

Apart from its functions of oxygenating the blood, Homo's breathing, which supports the smell, is an activity and perception in itself. The upright station of a trained walker, after having selected the barrel-shaped rib-cage of Homo erectus, which no longer had the shape of a cone as with the Australopithecus, has made that the diaphragm occupies three articulable positions: inhalation, passive exhaling, forced exhaling. This is how the abdominal and pectoral breathings were going to differ from one another, with different dosages depending on the case. The same respiratory system made it possible to subtly modulate the breath, to vary its speed, volume, and sonority, almost from moment to moment. And also to block it in any one of the aforementioned positions, with considerable effects on the concentration and relaxation of brain attention, as illustrated by yoga. Turning to become soul or spirit (*spirare*), the hominid breath will be the privileged location for rhythms.

Smell followed the breath-soul-spirit. This chemical analyzer, the receptors of which act according to key-lock triggers, and which is very archaic, judging from the localization of its brain centers, is extremely diminished in Homo, as indicated by the reduced volume of its ~~lessened~~ brain projections, diminished, as we find already in the great apes, due to the cranial-facial contraction. But, modulated by the breadth, hominid smell can both concentrate and spread out ~~concentrates and spreads out~~, distribute and plane. And, for the very reason of its weakness, as well as the positions of its orifices placed high on its body, between the globalizing eyes and proportioning ears, it compares, mixes, melts, composes, conceives all sorts of olfactory "timbres" and for all that it escapes ~~in turn to~~ the animal immediacy, opening up in distanciation like sight, hearing and touch. Often so pervasive that its distance animates the duration as much as the extent. The link between the breadth and the smell is striking in the Greek verb "pneîn", from which comes

"pneuma", breadth, and also spiritual principle. It simultaneously means blowing, breathing and smelling good.

The link between smell and reminiscence is a close one. The lobe of the hippocampus, which controls some aspects of memory, particularly emotionally charged, is phylogenetically a part of the olfactory lobe. The role of smell in the existential organization of hominid environment appears clearly in the dramatic suppressions of smell, which often result in *osmalgia*, nostalgia for the smell of the world. Conversely, *hyperosmia* go hand in hand with intense reminiscences, the classical example of which is the smell of Proust's *madeleine* that would support "the whole search for lost time".

1C5. Substantializing taste

The technician plane hands progressively freed Homo's mouth from the bite of the combat, the killing of the prey, the slicing and gripping of foodstuff, and left it with the task of a relatively omnivorous mastication, sometimes easier, sometimes harsher depending on the seasons of flora and fauna, but increasingly regular and slow. Using semi-circular jaws, equal teeth, an increasingly mobile tongue, and through the reflex circuit between savoriness and slowing mastication, hominid taste slid to sort, distinguish, savor, profoundly penetrate the substances. We can see the vital advantage this bears for a migratory omnivore. But also the contribution to attention - Lavelle deemed that taste intervened in the philosophical notion of substance - in a development that came close to that of technical and caressing palpation in tact, the proportions of tones and timbres in hearing, the detailing globalization in vision, the planing in smell, of which taste compensated the evanescence through its densities.

Taste penetration and differentiation were helped by the basic simplicity of four regions preferentially sensitive to: a) sweet, (b) salty, (c) acid, (d) and bitter, going from the front of the mouth to the back. And the intimacy of ingested substances was reinforced by the gustatory receptors that extend to the first third of the oesophagus, making digestions an afterglow (a persistence) of flavor.

As they combine with the walk and a vision allowing for harvesting and hunting its favorite foodstuff, Homo's two chemical senses, taste and smell, completed to segmentarize the technical *woruld. At the same time as they internalized and distanced this *woruld outside and inside. And it is very generally and intimately that the **places** aroused by Homo's stature and five senses, in opposition with animal **territories**, will be known as multi-sensory, multi-spatial, and multi-temporal.

SITUATION 1

The following expression was often used in this chapter: "was selected". However, the notion of selection is not simple. We could think, in a naive Neo-Darwinism, that an organ is selected for its performances from its own genes. It is not so, and as we like to say today, "a gene of the forefinger does not exist, nor does the gene for a hand" <R. Jan 98, 40>. Indeed, a same gene can be involved in the evolution of the fingers, the brain, the intestines, the genital tract; in such a way that an adaptive gain in an organ can go hand-in-hand with an adaptive loss in another. To signal the problem, to which we shall come back <21G3>, we could, rather than selection, speak of co-selection, and say that such an organ was co-selected (with benefits or disgrace for others) according to such function in such milieu in such moment in the continuous constitution of Homo as state-moment of Universe.

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