

ANTHROPOGENY – POST-SCRIPTUM

LIMITATIONS AND OPENINGS OF THE SYSTEM

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On the Poët-Sigillat, between the Alps and the Mediterranean, in the Southern Pré-Alpes where mules pathways cross the geological overlapping waves of the Barremo-Bedoulian, the Hauterivian and the Oxfordian, regions haunted by the two hundred million years of the Ammonites of the Secondary, sitting by the typewriter upstairs, next to the window from where we gaze out in summer nights beyond the Mont Ventoux, somewhere between the Scorpio and the Sagittarius, towards the centre of our Galaxy with its black hole. A bit higher up to the left, we see the Andromeda Nebula, which will one day crush into ours, and that shines under the scrutiny of painter Micheline Lo. The bed is placed in such a way that one lies down in the axis of the Galaxy. Hubert Reeves walked under this window when he visited the amazing centripetal mozarab arches of the choir of the 11th century church of Sainte-Jalle, which stands some way below. This anthropogenist physicist enjoyed comparing the stars, measuring their age in billion years in the miraculously clear sky of the Haute Provence Observatory, with the humble millenaries of our human constructions. This region, which comprises the Faille de Condorcet and the Fosse des Voconces, is told by its cartographers an open book of geology.

In view of some elementarities characteristic to every living, and of a few fundamental coherences and incoherencies typical to Homo, the *Anthropogeny* is so systematic – or at least systemic – that he who delves in it has little opportunity to look at it from the outside interrupting his reading to question its limitations and openings. Let us do this for a moment, being only indicative, else being forced to go through the entire system once again. And letting the reader the freedom to explore this path as he pleases.

Post-scriptum must be understood in its strictest sense, i.e. something that is written afterwards and that is not part of the same text. And hence does not engage it.

1. THE ANTHROPOGENY AS A DISCIPLINE

When Stephen Jay Gould positions himself in comparison to Darwin, he uses the word 'discipline' throughout the two thousand pages of 2002 's *Structure of Evolutionary Theory*, which was translated into French in 2006 under the title of *Structure de la Théorie de l'Evolution* and where, in his race against a forecast death, he attempts a last inventory of his intention. Indeed, Darwinian Evolutionism is not a *science* like biology, nor is it a *specialisation*, like neurology or gastro-enterology. There is something philosophical about it, insofar as it goes to the core of the ultimate questions of the what-how-why in one area specifically, that of the Living.

However, Evolutionism is certainly a *discipline*, meaning a certain way of looking at things, of envisaging, of going into what is encountered, both in floating attention and in the outline of a system. When it delves with the Living, it is above all a way of noting not simple *analogies*, but *homologies*. Hence, with the Horse, it means not considering what goes from the knee to the ground as a forearm, but as a finger whose nail is the hoof, just as Cuvier had done when he founded *compared anatomy*. Still, Darwin must probably be even more careful than Cuvier. For his evolutionism, homologies themselves need to be considered not as stable models (in the manner of Aristotle for whom species were eternal) but as the metastable moments of a biological, technical, semiotical becoming that responds to two main requirements. (a) That, for the Living, there should be unceasing, multiple *variations* in action, in power, or in reserve. (b) That these variations should constantly be subject to *selections*, either through external factors – like the drift of continents, climates and resources – or through internal factors – such as the anatomical and physiological compatibilities of organs and groups. Therefore, Darwin studied the sexual selection of men and women as being the most palpable for determining the species.

Since 1980, Eldredge and Gould have specified that these variations and compatibilities of the Living do not occur in a manner that is spatially and temporarily continuous as Darwin thought, giving way to frequent *orthogenesis* (the orthogenesis of the Horse was a moment of pure bravery for biology teachers in the 40's), nor by purely erratic leaps. They occur, they say, in a *punctuated equilibrium* whose units comprise regions, continents, or still, the entire planet in its five great extinctions of Living that have already taken place before the current sixth. The variations, which are relatively brisk compared with the usual persistence of the species once they have appeared, being explained (at least in many cases) by the temporary secession of marginal specific groups that hence favour variation, then by their return or displacement towards a main group that is sometimes far away. We could then think that the *Anthropogeny* (taking its definitive shape during the Gouldian era - around the 80's) has only had to add to the biological 'punctuated equilibrium', the technical and semiotical 'punctuated equilibria' characteristic to Homo – the angular Primate – who is by that precisely a technician and a semiotician.

But then, the *Anthropogeny* supposes an even more severe nominalism than that of biological evolutionism. Darwin could still speak of 'legs', 'wings', 'beaks' when observing the

variations of the birds of the Galapagos. Gould needs to be more careful when he describes the extinctions and explosions of species, genres, families, orders, but also of classes and branching, and he needs to stick – rather than to names of *organs* that are too fixist – to more versatile terms of *functions* as 'means of blowing, engines of movement, engines of repetition, flight, walk, reproduction, and oxygenation'. Since the *Anthropogeny* also deals with technical – and later semiotical – variations and selections that are frankly volatile, it must often be more careful and generalised than the Gouldian vocabulary.

Indeed, how would it dare to naively speak of 'memory', 'intelligence', 'will', 'art', 'religion', 'love', when these words have never been appropriate for anything but very limited historical circumstances, for example those of the Greek, Latin, European WORLD 2, where besides those terms had a sense that was more ideal than defined : 'L'amour est un je ne sais quoi' (Corneille), 'O charmes de l'amour, qui a pu vous peindre ?' (Benjamin Constant). The same applies to 'intelligence' : John is intelligent, Pierre is not, we dare say. Yet, our cerebral images and explorations 'neurone by neurone' of the Aplysie date back to the 70's, inviting us to speak of billions of local and transitory intelligences, of connections, disconnections, reconnections, accentuations, fading, cleavages varying from one brain to the next, but also in each brain varying at every instant. And what is the 'will' if it is true that the object of both the Greek *boulè* and Latin *voluntas* is supposedly good aims, whereas the German *Wille* (that of Niebelungen, Luther, Wagner, Hilter) is ontologically indifferent to accomplishments as it is content with displaying an immense, diffuse *Wille zur Macht*.

This lability of organs and functions commands the status of the definitions in *Anthropogeny*. In Physics, Chemistry, Mathematics, we can make very useful tables of definitions. The short table that Hawking joined to *A Brief History of Time* not only enlightens a few fundamental notions of Physics that are not very familiar to the non-specialist, such as that of *singularity* ('Singularity, a point in space-time at which the space-time curvature becomes infinite'), but still, because this word was chosen by him for being defined, this sole fact shows its importance in Hawking's general intention, which is to make do in a Physics Theory – as much as possible – without not intuitive notions, as 'singularities', and thus to diffuse the two principal of the time , (a) that of the black holes (and he insists on their halo of emission), (b) that of the Big Bang (and he insists on its quality of pole rather than of mere beginning). In the same way, Chemistry dictionaries such as that of Cambridge's, by the sole fact that they choose and define a word, and paradoxally situate it fortuitously in a hasardous alphabetical order, often give it new synthetic enlightenments.

On the contrary, the Anthropogeny, say a bio-techno-semiotical discipline, makes tables of hominoid faculties almost impossible, because Homo is infinitely more instantly evolutive, more swiftly punctuating his Gouldian equilibria, than every other Living. So that, for defining a human case, we should have to remember the complete *Anthropogeny* for every case. As a consequence, the only satisfying anthropogenic survey is to produce short, tightened, succinct anthropogenies. Here it is *Around Homo in Eighty Theses*, or the present *Post-Scriptum*. And the *Systematic table* listing all the titles of every chapter in their anthropological order. And even the *Alphabetical* table where, a little like in Chemistry Dictionaries, the chances of the alphabet create close partings and distant proximities.

The *Anthropogeny* is a work of WORLD 3, that of the Discontinuous, and it is closely consanguine with computer manner of writing or scripting of WORLD 3. If the Internet text is scrolled rather than leafed through, and thus no longer favours stable definitions by immediate

synoptic comparisons like the Mediterranean *codex* did since the first century of our era, when it succeeded scholarly to the Greek *bublos*, hence innovating the Plotin (+250) systematic philosophical "discourse", ignored by Plato and Aristotle, it conveniently invites us to play with the varied fonts and characters to suggest, between different and similar typing in next and distant places of the text the Gouldian equilibria, biological, technical, semiotical. For this *reticular (allagmatic) systematicity*, by Gilbert Simondon and the painter Micheline Lo. (Cf, Ontologies locales, Cosmogonies contemporaines)

2. INTERDISCIPLINARITY WITH HISTORY

Seeing the Darwinian evolutionism – or more exactly Eldredgian-Gouldian – of the Anthropogeny, history is the most necessary of humane sciences. History in both senses: in the *strict sense*, that of eras recounted by written documents, and in the *wide sense*, that of before the writings of primary empires and that can only rely on paintings, sculptures, development, ecological systems such as those for the neolithic, paleolithic, the eras of Homo Erectus, Homo Habilis, Tumaï, Orrorin tugenensis, etc.

Between 1900 and 1960, philosophers of History (in particular Germans and Italians) tried to determine the part of truth in historical studies. Some intended only to trust an exclusively factual history, consisting of dates, taxes, titulars, victories and defeats, and the other, at the opposite, for whom events were more or less necessary apparitions of *a priori* principles in the line of thesis, antithesis and synthesis with Hegel, or of the class fights with Marx and Engels. Between these two limits, intermediate positions were hardly reassuring.

Indeed, the weaknesses of the historian are blatantly obvious. First, what are the frontiers of an event, admitting that there is an event? Then, when an event is delimited, the historian can only consider four or five of its factors, whereas there are one hundred, or myriads, amongst which the most essential are often unsuspected. On the other hand, historical interpretations are the most ideological. The consensus of the interpreters guarantees only that there is a people that largely depends of the history it imagines. Since the dawn of days, the historian has been the principal factor of the social consensus. Michelet makes an exalting history 'of' France, for he feels that he *is* not only a Frenchman but France itself, just like Hitler felt as being and was recognised as 'the voice of the German people'. After a war, one hundred years are usually necessary before the children of the fighters are able to admit that the enemy of their fathers did not commit all the atrocities conferring him his statute of enemy. This is without considering events that hid others. Marignan's Escarmouche exaggerated to the Jannequin's *War* to help forget the true defeat of Pavie. Merleau-Ponty's 'Plato still speaks to me' summarises the perplexities of the historian. What exactly 'Plato', 'me', 'parle' and 'encore' mean here?

But with that all, how can an *Anthropogeny* – whose radical evolutionism endlessly requires history – still stand? Unless the historicity that matters to the Anthropogeny is would be of another nature. Then, in the hominoid populations that it considers, it should not care as much for their objective or objectal *events* than for their *destiny-choice-of-existence*, which holds above all in four dimensions : (a) a general and differential *topology*, (b) a *cybernetics*, (c) a *logico-semiotics*, and (d) a *presentivity*. (General Anthropogeny, 8).

Let us detail. (A) In the *general topology*, we find the propensity adopted and usually practiced in the fundamental couples : close/faraway, continuous/discontinuous, surrounding/surrounded, closed/open, path/barrier, etc. And, in *differential topology*, we find the propensity for one of the 'singularities' of the seven René Thom's elementary catastrophes (strepHeïn kata, transformation from one form to another by means of a singularity) : the fold, the break, the swallowtail, the butterfly, the hyperbolic umbilic, the elliptic umbilic, and the parabolic umbilic. (Local Anthropogenies, Semiotics, Mathematics and sexuality) (B) In *cybernetics*, a propensity shows either for the feed-forward or the feedback, for the adjustment

or the easing of pieces, etc. (C) In *logico-semiotics*, a propensity for the adjectivation, the substantivation, the adverbialisation, the gerondisation, the syntactism, the paratactism. (D) Finally, in *presentivity*, the emphasis on the functionings, or rather on the presence-absence-apparitionality according to the primordial universal anthropogenic distinction : *functionings* / *presence-apparitionality*.

Fortunately, these four characters are often accessible in sensu stricto history's written documents, and even in the archaeological documents of history sensu lato. Here are some examples that are frequently encountered in the *Anthropogeny*. (a) The passage from the *backbone line* of Paleolithic animals (Lascaux) to the Neolithic quadrated *framing*, first on the ground and consequently on the wall (Çatalhüyük). (b) The exclusion of the wheel in the Amerindia may be because of the penchant for topological compactness of the thick creative blood (Quiq). (c) The ontological and epistemological implications of the graphisms, according to their status as ideographic (Chinese) or phonetic (Sumerian). (d) The implications of the passage from (uncoiling) Bublos to the (leafing through) codex in the first century of our era. (e) The existential consequences of manual scripting and printed scripting. (f) The 'lifestyles' deriving from the replacement of the sundial and the hourglass with the pendulum clock. (g) The autarkic Greek frontality contrasting with the Roman-Stoicist-Christian-Neoplatonic intimacy. (h) The opposition between the Greek *tekmèrion* (demonstrative) and the roman *indicium* (probabilistic). (i) The priority of the convex in Greece and the concave in China (Lao Tzu). (j) The conflict of the three Mediterranean aesthetics : the numeric of Sem (Hebraic), the pulsatory of Cham (African), and the harmonic of Japheth (Greek). (k) Disjunctions inclusive in China ('wu'), exclusive in Greece (third excluded) , askew in Talmudic logic. (l) The dual articulation (Mazdean, Manichean) versus the indefinite articulation (Indian). (m) The passage from abstract machines distinguishing ostensibly their functions to the concrete machines that conduct their functions in *overlapping* (Simondon) (Local Anthropogenies, Phylogenesis. Priority of Technique (*Le Nouvel Age*, 1962). (n) Nature as a vis-à-vis for Homo versus the 'median reality' of the technique-nature or nature-technique of concrete machines (Simondon). (o) The passage of stable or instable complete individuals to the temporary and local encounters of 'metastable' individuations (*Local Anthropogenies, Ontology, De l'individu aux individuations* (Simondon)).

We shall probably agree that the **history of destiny-choice** of existence, rather descriptive, is much more reassuring than narrative history, and that an anthropogeny can find its root in it as it brings unsuspected dimensions to eventful history and can even found it. We shall justify this point using two examples, one of which is very general while the other is more particular.

A) Like many others, Wittgenstein notes that artists practicing different arts (a writer, a painter, and a musician) but of a same historic moment are more similar amongst them than artists practicing the same art but in different moments. Concerning the destiny-choice of existence, Descartes is a material and mental contemporary of painter Georges de La Tour. Painter Vermeer is the exact contemporary of Spinoza. Bach of Leibniz, Mozart of Diderot, Beethoven of Hegel and Lamarck. Physicist Max Planck of the artist Marcel Duchamps and the inventor of comic strips Mc Cay. The anthropogenist historian will not be surprised that a generation usually shares similar – even identical – topological, cybernetic, logico-semiotic and presentive choices. Bergson had observed how the most opposing philosophers – such as the 18th century rationalists and empiricists – in fact activated the contrary poles of a same fundamental party.

B) Now let us choose a specific example that is rich enough to measure the stakes with some sensitivity, and imagine a historian intending to write a *History of sexuality in the Middle Ages*. If he is trivial, he will probably invoke the taboos of Judeo-Christian morality and the influence of the 'Church', along with the few usual quotations related to this topic. If he is somewhat anthropogenist, things get much more complicated, although they may become more clear.

The Anthropogenist will indeed remember the will of Greece, which initiated WORLD 2 since -750 (the "world" of the distant continuous), of only seeing everywhere *wholes consisting of integral parts*, hence *forms standing out adequately from their background and following the axiom of the excluded third*. (a) Then, each Greek form possesses a certain autarky, a *aFt-arkeia*, whose etymology requires a sufficiency (arkeia) by itself and for itself (*aFtos*). (b) What follows is a theory of the desire as the consequence of some missing element (Plato). (c) The requirement that every operation as human – according to the rational artisan inaugurated by Greece – must have an end, a goal, and not merely procure a satisfaction (Aristotle). (d) Geometrically, that postulates the right distance of the viewer ('mèden agan', nothing too much), the *tHeastHai* of the *tHeatron* in front of its *skènè* (tent, stage) where the spectator grasps things in a synchronic manner, like does the Logos, the reason-language, -Vinci will say : like God the Painter. (e) Consequently, the perfect object is the top-pointing triangle of the Parthenon (penial). (f) In differential topology, the concave rift (vulval) is suspect to the profit of male convex bodies that Pindar has sung in his *Olympics*. (g) Logic demands the axiom of the excluded third, never tolerating the axiom of the Chinese inclusive disjunction (wu), even if the daily discourse uses the latter endlessly. (h) What follows is a certain fascination of masculine homosexuality that we even find in Socrates when he speaks of Alcibiades.

Yet, the entire Greek program is incompatible with the *coupling* and *orgasm*. The first establishes an equivalence of the convex and the concave, muddling bodies to the extent that it is at the opposite of the excluded third, the second unsettles the rational detachment of forms on (against) the background, and the articulating power of the Logos in general. In the coitus, physical and mental intimacy hurts Greek frontality and the scenic totalisation of the *theastHai*, the *tTheoria* and the *tHeatron*. Since pure satisfaction without ends is deemed insufficient, sexuality must be justified by an *goal*, which will be *generative (genital)* in a civilisation of eternal species (Aristotle). The unease of WORLD 2 regarding sex is confirmed in its unease towards *friendship*. Although the latter is recommended in practice, it remains a theoretical threat for the autarky (*aFt-arkeia*), unless we admit – like Aristotle, who was visibly embarrassed on this occasion – that the Greek 'me' is by itself sufficiently vast to be simultaneously the Same and the Other, in such a way that the friend brings nothing exterior (another theoretical advantage for homosexuality).

We clearly see that, for the anthropogenic discipline, the unease of the west regarding sexuality starts in no way with the 'Judeo-Christian' moral of the first century of our era, but begins in Greece as it is pre- and protohellenic. This unease will last until the very end of WORLD 2, as proven two millennium later by westerner Paul Valéry in his correspondence with Jacques Rivière, in which he explains the violent trouble he feels as he has just had a 'positive' sexual experience.

However, for the historian who has set his mind on medieval sexuality as a theme, and who has some anthropogenic views, this unease of WORLD 2 gets even more complicated

during the first century of our era. This time was marked by the invention of *Virgilian-Latin-Stoicist-Christian interiority* and *tenderness* whose philosophical formulations will be provided by Plotin's *neo-platonism* in + 250 AD and will dominate the entire first millennium, reigning until Dante in the 1300's. In classic Latinity, the 'persona' would only define the mask and the actor. With the first Century, it soon took such a consistency that Athanasius conceives (in Nicaea, + 325) the Creating Principle as being the love of two persons, the Father and the Son, in an interpersonality that is so intense that it is itself a person, the Pneuma (Greek and already Mazdean). This vertiginous audacity of three 'persons' into one 'being' will find its confirmation in 1250, when Thomas Aquinas lifts the ontological contradiction by making the semiotical distinction between the divine *unity* as *substance* and the plurality of divine persons as *relations*, right to Hegel's and Engel's' Dialectic of the simultaneously logical and ontological *thesis/antithesis/synthesis*, where the Thought-Substance, initial and final, is indeed one in three moments.

Hence, is it not surprising that the Fathers of the Western Church, who were penetrated with Neo-Platonism, have made the sacramental orgiastic coupling (what defines the Greek-Christian 'sacrament' is that it is ontological and substantialist) of the intrinsic trinitary union of God, the prominent symbol of the union of the Church and the Faithful, in a symbolism that is still vivacious with today's Orthodoxy (Evdokimov), in the Eastern Church . The Fathers of the Western Church, starting with Ambrose, are not far from these views : 'omne masculinum adaperiens vulvam sacrum domini vocabitur'. Moreover, when African Augustine, disciple of Ambrose and whose child is called Adeodatus, asks "what do I love when I love God?", he excludes – but with what descriptive complacency! – the 'membra acceptabilia carnis amplexibus' whilst he attributes his 'interioris hominis mei' 'quemdam amplexum quod non divellit satietas'. Nothing in the evangelical text opposed this view that Augustine would daily commented to the faithful of Hippo. Moreover, we know, since the discovery of *Philip's Gospel* c. 1940's, that it is through the sacrament of the kiss on the mouth of the Adon and Mary Magdalene that, around +200, a *Gnostic Gospel* understood the words of the *canonical Gospels* : 'In the kingdom there are no longer men and women'. So was borne the gnostic version of "the other as an 'I'", and "the I as the Other", commanded previously by *friendship* according to Aristotle. A Muslim tradition relates that, around + 620, Muhammad received and conceived some verses of the *Koran* 'under the blankets with Aïcha'.

For the Sexuality in the Middle Age, i.e. the theme of our anthropogenic historian, these symbolic breeding of the Flesh and the Mind characteristic of the 'mediteraneism' (a concept of Ungaretti and Verdenelli about Dante), will make the servant of *Montaillou village occitane* (Leroi-Ladurie) say that her carnal relations with her vicar were in no way guilty, as they were not venal (Greek ' pornos'). It was only in the neighbouring town of Montaillou, in the beginning of the bourgeoisie, that the 'good order' required more formality. Underground but firmly, the ontological and epistemological carnal synthesis of primitive Christianity will survive until the infinite 'gozar' of the Spouse in Jean de la Croix's *Nuit obscure*. And the substantialist Bossuet – although not mystical himself – still resorts to the most sacramental orgasmic coit in his *Meditations on the Gospel* to proclaim, right in the face of Tartuffe, the ontological union of the catholic eucharistic sacrament : 'In the transport of human love who does not know that we eat, that we devour each other, that we should like to incorporate him in every way and, like the poet would say (Lucretius, *De natura rerum*) tear out with our teeth what we love to become united to it, to feed from it, to live on it...'. In around 1900, Claudel – who was from the same substantialist family as Bossuet – remarked that the most ontologically sexual nudes of

human history had been painted by Titian, bought by Charles the fifth and admired by Philip II during the Counter Reformation. The 1600's were the years when the opera was conceived, when in Jesuit colleges of the time para-orgasmic screams of martyrs saints resounded alongside the properly orgasmic screams of the Lovers (a topic familiar to Robbe-Grillet and chiefly to his paramystical wife).

In such a context, the anthropogenist historian will not implicate 'the Church', nor 'Judaean-Christian morals', when encountering in the Middle Age the recurrent occidental topic of the 'female body as a horn (a bag) of refuse', peculiarly with a "troubadour de fine amour" whose verses still were cited with insistence c. 1960 by the psychoanalyst Lacan. The repulsion of WORLD 2 towards the convex and the slit will suffice. As to the recurrent affirmation that the sexual act is justified by the providential necessity of 'increasing the number of the chosen', its roots have to be sought in the Aristotle' doctrine that the happiness ('eF-daïmonia') is to be obtained only in productive *actions*, never in pure satisfactions, and even less in experiences of pure presence. The occidental conviction that the useful is the value will persist until Bentham's utilitarianism. Victorian modesties and immodesties are akin to *bourgeois technician utilitarianism*, more than) to ritual Jewish modesty and ontological Christian modesty of the same period. On that point, physicians and theologians speak the same language.

So many paradoxical views are a good opportunity for an Anthropogeny to remark in passing the feeble impact of theories over practices. Plato's and Aristotle's *anti-sexual theories* never prevented the Greek to reproduce or to enjoy – in a secular or mystical manner – such experiences for which their philosophies had no words. Moreover, the anthropogenist will use this opportunity to mention that, in Greece, we find the same contradiction concerning *art*. In his *Ion*, Plato offers to chase the poets from the Republic for their 'irrationality'. Aristotle points out only the 'ritual purgation', catharsis, a quasi-medical aspect of the Greek tragedy (Ross, *Aristotle*, 1923). Both were theoretically incongruous. However, in practice, the Greek were the most powerful thematisers and accountants of pictorial, sculptural, architectural and theatrical perceptive-motor and logico-semiotic field effects, which is the central characteristic of art. In fact, the Aristotelian *aFt-arkeïa* never blocked the way to *friendship* as it was recommended by Epicurus. Additionally, some Athenians (although they were careful disciples of Aristotle) probably had true 'autartic' friends that were very 'different' from themselves.

This should suffice – we hope – to briefly illustrate the interdisciplinary exchanges between *anthropogenic historicity* and *trivial historicity*. However, these exchanges are of such importance that the present *Anthropogeny* must provide a few developed examples of it. They are *Histoire langagière de la littérature française* on the same site, where are found the destiny-choices of existence of fifty writers in what was once described as a 'phylogeny of the French intelligence' (*Local Anthropogenies, Phylogenesis, Histoire langagière de la littérature française*, France Culture, audio 30 x 30'). Similarly, *A photographic history of photography* shows the topological, cybernetical, logico-semiotic and presentive destiny-choices of fifty photographers. (*Local Anthropogenies, Phylogenesis, Histoire photographique de la photographie*). We hope that the reader, helped by passim remarks on the same site, will be able to carry out himself in the same spirit a *Pictorial history of painting*, an *Architectural history of architecture*, and a *Musical history of music*. And even an *Essential history of dance*. Dance, as being the rhythmic thematisation of the gesture and the step, is still the most specific artistic exercise of Homo, the angular Primate.

Stephen Jay Gould feeled that, by instituting *paleobiology*, Eldredge and himself gave the Macroevolution its autonomy, and that the latter was not at all a simple extrapolation of the Microevolution as it was still the case for Darwin, but an autonomous discipline, determining the "punctuated equilibria" of the Living. We hope that the few anthropogenical examples we provided a moment ago will suffice to confirm that **Macro-history**, that of the *Anthropogeny*, is not a simple extrapolation of the evenemential one, or **Micro-history**. Its sustained attention to topologies, cybernetics, logico-semiotics and presentivity underlying the events gives it own referentials that are thrivingly heuristic. Now, this macrohistory is more **gradualist** (orthodox Darwinism) or rather **punctualist** (Gouldian-Eldredgian Darwinism)? Rather both.

3. INTERDISCIPLINARITY WITH HUMAN SCIENCES

Very often, the beginning of humane sciences (something to which the *Anthropogeny* appears as being the missing link) is set at Wundt's experimental psychology, around 1880. Indeed, at that time, Physics, Chemistry and Biology reached such a consistence that they felt almost complete, and Homo could believe that their methods were about to lead to wonders through their application to specific domains such as 'intelligence', 'will', 'memory', 'emotions', 'feelings', 'family', 'guilds', 'motherlands', 'arts', 'mathematics', etc. The moment was even more favourable that 'exact sciences' were about to undergo their '*crisis of fundamentals*', questioning the unity or disparity of geometries with Klein and Poincaré, the One or the Multiple as the source of numbers with Dedekind, the reliability of induction with Duhem, the idea of experimentation versus experience with Mach, Meyerson's notion of 'physical theory', or Gödel's limitations of axiomatics, etc.

Therefore, was there a better circumstance to launch a **Semiotics** (Peirce), a **Linguistics** (Saussure), a **Sociology** (Durkheim), an **Experimental Psychology** (Dewey, Watson), a **Transcendental** (Husserl) and an **existential (Heidegger) phenomenology**, a **Psychoanalysis** (Freud), a **Genetic psychology** that would lead to an **Experimental pedagogy** (Piaget)? Darwin's evolutionary views had made Homo appear as a species amongst other species, albeit higher in the hierarchy of complexity according to Spencer. For the Ancients, the historicity and geographicity of men were accidents of a human essence. Now, they made it. Why not apply to him the common tools of scientific knowledge?

3A. The new paradigms

It was stirring at first. In 1890, *James Frazer* inaugurated the twelve volumes of *The Golden Bough*. He finished this work in 1915 and compiled it into one volume in 1922, having experienced a success that was both scientific and popular and that would influence English literature for the entire first half of the 20th century. Totems and taboos, more than concepts and ideas, were at work in every human society, primitive but also developed, deriving from the resources of metaphor (similarity) and metonymy (contiguity). Frazer was anticipating Homo as an individualising and indexing primate. His contemporaries called him a *social anthropologist*, but he himself spoke of **mental anthropology**, a project of epistemological and ontological phylogenesis of Homo that would herald, in many traits, the discipline of *Anthropogeny*.

Very soon, *Malinowski* doubled this cabinet anthropology with an on-site anthropogeny that he collected in the Pacific islands, showing the functional consistencies of cultures around what the *Anthropogeny* would call their destinies-choices of existence. Simultaneously, scholars realised the cultural importance of the physical characteristics of the groups according to the races. In 1885, *Topinard* published a first manual of **Physical anthropology**, noting the geographical disparities that, in 1986, for its anniversary, a collective book of French CNRS would call the 'sub-species' or 'great races' of sapiens sapiens.

Economically, **Mauss** pointed out that the human exchange systems, that were subject to theories since Adam Smith, did not respond to various kinds of equalities, nor even to the optimization of profits supposed by Walras's *General Equilibrium Theory*. Quite to the contrary, the Amerindians' *potlatch* demonstrates him that often they search the maximizations of the gift in search of the prevalence of the chief, or of another social figure. His 1925's *Essai sur le don* was relayed by the concept of 'spending' with Georges Bataille c. 1950.

Inspired **linguists** were soon to make discoveries which all unsettled the WORLD 2 Occidental sense of equivalence, rationality or semiotical arbitrariness. As for the time of the verb, Worf, an American linguist, studying the language of the Hopi discovered an Amerindian destiny-choice of existence without future, where any present was a continued ancestral past. In New Zealand, Leenhardt, a French linguist, appreciated by Mauss, found that, , human bodies were not fatally closed wholes that were limited by the skin, but linguistically opened wholes where the organs of a same 'I' would send back to different places, objects and qualities of the environment, with inversions of the close-by and the faraway. In one word, **languages** were not systems of communications that had every advantage of remaining fixed, but they were actions, *Speech acts* as Searle will say in 1969, constituting from instant to instant, almost of word to word, new worlds, or at least new appropriations of the world. Since 1930, Wittgenstein, departing from the metaphysical and abstract "silence" of his 1927' famous *Tractatus logico-philosophicus*, begun to explore the inexhaustible concrete performances of speech practices, that will weave his unexhaustible posthumous *Philosophische Untersuchungen* (1951).

The human essence of classic anthropologies also veered to the *Anthropogeny* when, since 1900, Durkheim's *static sociology* started being conscious of the notion of **human populations**, making the Darwin-Gould distinction between centers in stasis and margins of innovation. For instance, this explained the stability of the number of adherents in political parties, who paradoxically, in democracies, every one is convinced of his singular freedom of opinion. In addition, social systemic allowed correlations between different areas, like for instance; in Durkheim's mind, when a rise in suicide rates would forecast a war or, as Durkheimians say today, when the decrease of female fecundity of Muslim women perhaps betrays a fading or re-organisation of the Muslim faith. Hence, each human specimen was a collection of singularities, although belonging to large numbers.

However, the most violent anthropogenical shattering of humane sciences took place when, in 1902, **Golgi** took the first photographs of **neurons**, and when, in 1906, Ramón y Cajal obtained a Nobel Prize for having photographed neuronal connections and cleavages. Hence it was no more enough to want to understand Homo's faculties using introspection and philosophical discourses! Or to be content with measuring stimuli / reaction couples, as required Dewey's behaviourism and Koehler's Gestal Theory. Behaviorism and Phenomenology were initiated at the same time. No, from Golgi on, we could understand nothing about ourselves without having visited our nervous supporting structures. The human soul had definitively lost its unity as an "arx mentis" (the culminating citadel of mind, like a finest point).

In the 1960's, the knowledge of neuronal paths had made such progress that Hebel decided to clarify the most obvious of human perceptive systems (Ich bin ein Augentier, Goethe), the **visual system**. When a cat – or ourselves – sees a mouse running, we grasp forms, movements, sometimes even colours (hue, lightness, saturation). Now, Hebel was stupefied to see that, for each of these functions, separate nervous suites would intervene. The latter, even after their passage from ganglion to ganglion, would continue to work separately without ever

requiring a *mother cell* that would totalize this information to create "one" unitary perceptive object, for instance 'a grey mouse running across the floor', which then launches a motor gesture (I chase it with my broomstick). The nervous system was interconnected relays more than places, or even real cerebral areas. A satisfactory opportunity to remember that in the Living the nervous system is mute about itself, and that, in the perceptions-motricities there are only *percepta* and *mota*. The phenomenologists, as Husserl, had pertinently observe that we do not grasp a Cartesian 'cogito', but only 'cogitata' whose 'cogito' is merely a collateral pre-supposition. Let us say the same anthropologically : A singular human "I" is a state-moment of the Universe limited at a singular World determined (and memorized) by the perceptivo-motor selfish cycle (Damasio) of a particular body and nervous system.

Finally, circa 1970's, psychologists could no longer ignore that, besides hominoid and animal nervous systems, exist **analogical computers, digital computers, hybrid computers** (both analogical and digital), which were capable of carrying-out operations not without similarity with a nervous system. They even begun acknowledging that, in our brain (resembling a hybrid computer), the *right hemisphere*, which had less to change evolutionarily, continues working chiefly in an *analogical* manner, whilst, in the *left hemisphere* – and in particular since the great Apes– some *more digitalizing functions* had progressively regrouped. This goes eminently for the Broca's (emitting) and Wernicke's (receiving) areas of the language, interconnected by a massive bundle, and for some differentiating aspects (opposite) in music and drawing practices. In the eighties, at the M.I.T., in his seminal study, *Vision*, **David Marr** wondered which computerizations a computer (analogical, digital, hybrid) had to perform to 'see' a bottle taking on a certain unity and stand out like an object on a table. On this occasion, one of the fundamental principles of the work of nerves stood out : to make what stands out stand out until a *connection* ; to erase what stands out less until a *cleavage*.

The '*system*' and the '*structure*' – so dear to Vitruve – ceased to be preliminary to any construction to the profit of notions as **modules and network**, adapted to Darwinian (now Eldredgian-Gouldian) variations and selections. Agreeing with Searle's *Speech Acts*, **experimental linguistic** focused its interest on the *modular construction* of language in the infant and its modular deconstruction with the senile. The first copyright on *The emergence of language* (Sc. Am. Library) dates back to 1972. Our RMI makes us able now to follow the neuronal activations and deactivations of the *Neurones of reading*.

For summarizing, let us go back to the psychology of the "Me" that haunted WORLD 2, fond of **Characters** since Theophrastus (the disciple of Aristotle) right to the followers of La Bruyère' *Caractères*, and even Kretschmer's. In 1950's, under the effect of all of the above, Le Senne's *Characterology* was the last of the genre, and soon replaced by **factorial analysis**. It was no longer about distinguishing the wise from the mad, the intelligent from the stupid, the phlegmatic from the sanguine, psychiques, leptosomes or athletics or still, manic depressives, schizophrènes and paranoids amongst the psychotic, or hysterics and obsessionals amongst neurotics. In a world becoming planetary, around 1960, it was decided to urgently define identical and identifiable 'symptoms', whether in a New York city dweller or in an Australian aboriginal. These symptoms gave way to statistical correlations leading to recognising '**factors**' that were non definable in essence and accident, but that were sufficiently delimited that 'remedies' could correspond to them, remedies that were testable, even experimentable although they did not necessarily brought an explanation. Disputable or not, the **factorial analysis** has been one of the major epistemological and ontological revolution in the evolution of human

species. In perfect mental consanguinity with the Evolution conceived as 'punctuated equilibria' by Eldredge and Gould.

3B. The stasis of paradigms (Kuhn)

We have just put together a few of these events when human sciences, recently created, enlightened the *anthropogeny*, and when the *Anthropogeny* began to *found* them in return. We still need to understand the stasis of a few others of humane sciences during the same period. Every time, the essential explanation lies in the ambiguity of their mentality. Their aim was to approach Homo using the methods of the exact sciences of WORLD 3, but by staying at the same time in the epistemological and ontological destiny-choices of WORLD 2. It was in this climate that **Kuhn** generalized his notion of **paradigm**, and of decided and hesitating change of paradigm.

In particular, since 1900, **Freud's psychoanalysis** has never gone away from western paradigms that contributed to its huge success in society with its hermeneutical sterility. (a) A concept of the dream that refused to see in it the repairs to the neuronal bugs of the day, thus a training and learning animal function, and preferred to seek in it, - in a Greek finalist view, - the indirect accomplishments of an ultimate ending (*finis ultimus debitus*) that was Platonician or Aristotelian, the *libido*. (b) The genitility as the ultimate justification of the sexual function in the straight line of Aristotle's theory of the pleasure as a complement of utility. (c) The vertical orientation of the two Freudian *topics* right up to a theory of *sublimation* reminiscent of Jamblique's *Proteptic*. (d) The sexuality treated as an abstraction (Sexual-ität) without reading at least phenomenologically the orgasm (three lines to say it 'gewaltig'), nor even the coupling, probably in the Hellenic fear of anything compromising the ideal of wholes consisting of integral parts. (e) An almost Hegelian dialectic of bucal, anal, genital phases punctuated by 'universal' ou mythical complexes (Oedipus, Jocaste, etc). All that in such a way that, for hermeneutical studies, every existence - even of the most innovative artists - would be reduced to the same chorus : *Hölderlin ou la question du père*. To his honour, Freud (whose friends had made him aware of the photographs of Gogli and Ramón y Cajal in Vienna very early on) wrote down in some of his unpublished works, and in some passages of his publications, that his 'hypothesis' would crumble when more would be known about the nervous system.

Concurrently, around 1900, in his creation of a **linguistics**, **Saussure** suffered and even despaired of remaining locked in the WORLD 2, always considering language as the arbitrary manifestation of a non arbitrary logos, without seeing that, anthropogenically, Language presupposed Technique, its glossems being only the technems with their operativity put in suspense. Hence, as a perfect western classical rationalist, he carried on considering that languages were adequately translatable one into the other, since their significant expressed their signified in an arbitrary - hence codable - manner, and that their signified were not the objects of works distributed by (according to) ideas, as for his contemporary Peirce, but these ideas themselves, which made linguistics independent from the technical changes around it. By such improbable hypotheses, the linguist had the advantage of working on a science entirely sprawling on his table without every getting out, yes, without suffering from any change, even dramatic, in the technical environment. Simultaneously never assured that there was something outside corresponding ontologically or epistemologically to his constructs.

One generation later, **Jakobson** deserves particular attention concerning the stasis of the paradigms of WORLD 2 in WORLD 3. Indeed, in his remarkable theory of the 'twelve phonematical traits' that he developed with **Halle**, he has well seen and pointed out that the language was on one hand an audition (particularly distinctive) like for Saussure, but on the other hand an emission whose significance was existential according to the vocal efforts and relaxes. Hence, he caresses very closely the anthropogenical definition of languages as *phonosemical productions*. However, in his analysis of *The Raven*, under the general title of *The sound and the sense*, he is content with counting games of assonances and alliterations without ever marking that they implicate a particular topology, cybernetics, logico-semiotics, presentivity, in a word a 'work subject', the realisation of Edgar Allen Poe's 'destiny-choice of existence'. Why this paradoxical shortcoming ? Jakobson remained faithful to the two surannated Saussurian doctrines: (a) *the arbitrariness of the sign* (in contradiction, for instance, with the Kluge's *Etymologisches Wörterbuch*) and (b) *the universal translatability* of languages. Possibly confirmed into error by the fact that, in 1950, the two Saussurian presuppositions of WORLD 2 seemed to find confirmation in the first *translating machines*. Indeed, during the second half of the 20th century, school-taught linguistics became a science of the translation, meaning that the pertinence and power of a linguistical theory is judged by its capacity of accounting for the programs of translating machines (James Allen). This useful and lucrative aim of blind, deaf and clumsy linguists had been ignored by all the proper linguists, as were Worf, Leenhardt, Wittgenstein, Searle, and traditionnally by all the most acute practitionners of language, i.e. the writers, all knowing that speaking was a matter of **phonosemics**, the proper object of this "new discipline" that Mallarmé said he had created in the 200 pages of his *English words*.

Since the 1950's, , who concluded this perseverance of WORLD 2 paradigms, offered a *Cartesian syntax*, thereby continuing to differentiate surface (local and transitory) structures and deep structures (meant to be universal) of the *Grammaire de Port-Royal*, as well as a roughly *Leibnizian binary semantics*. In Leibniz's *Kombinatorik*, the closed inventory of the monads, which are necessarily deduced from a necessary God as the most favorable of the compossibles, allowed locating any object of the world exclusively using a suite of 0/1 bits. Chomsky continued to understand the *sign*, for the needs of this syntax and this semantics, using their medieval status of 'stare pro aliquo', without seeing their technical source which – following the ceaseless progress of Technique – would have forbidden any definitive binarization. Finally, Chomsky, having turned back to his purely Platonist roots, went so far as to suppose 'innate structures' of the language. To his honour, he ends up refuting all this in his *Reflections on Language* before turning to political polemic, probably because he had grown tired of such a dubious discipline.

The semiotical blindness of the American Chomsky is even stranger that apart from *Bloomfield's* rather healthy ideas on the origins of language in the 1930's, he must have known of *Peirce's*, a contemporary of Saussure around 1900. Peirce was a close participant of Emerson's American transcendentalism. He created a general **semiotics**, where he never believed that a *significant* 'HORSE' would refer to a *signified* <horse> that was only conceptual, as Saussure put it, but indeed to Equidae in prairies, even though the latter may be targeted through the *idea* of <horsiness>. The question was then if this "horsiness" was purely arbitrary (according to Occam's medieval nominalism) or was the result of some essential order of things (Platonist and Aristotelian medieval realism) or still a formal distinction founded alongside the object according to Duns Scot's famous 'distinctio formalis a parte rei' whose

Peirce was declaratively a disciple. There, language and all sign systems were not pure games of difference in the manner of Saussure. When he worked his linguistics, the linguist knew that there was something behind his door ; something other than pure '*referents*' devoid of own consistency. For 'HORSE', he was sure that horses were no zebras. In accordance of Pierre d'Espagne, the Peircean sign was the definer of a true defined. We shall hence not be surprised that Peirce was the first to grasp something of the semiotics of photography, unfortunately mixing up its aspects of lat. *indices* and lat. *indicia*. Partly because of the English language, not departing lat. *indicia* and lat. *indices*, partly due to his Occidental penchant (like Plato, Athanasius or Hegel) to see everywhere Trinitarian distributions. Here of Being and Signs ("We think only in signs") as Firstness, Secondness, Thirdness.

At this point, there is nothing to add anthropogenetically concerning **Lévi-Strauss cultural structuralism**, where the French anthropologist proposed a reading of the cultures starting with the mere oppositive views of Saussure-Jakobson : "Dans la langue il n'y a que des différences". Mistrustful towards "sense" in general, he claimed that every existential "significance" in matter of Culture and Art belonged to 'shop girls philosophy', that is in the 1950, Heideggerian and Sartrean existential phenomenology. In the 'Chemins de la création' (Skira), the opposition between open mouth / closed mouth distinguishing two neighbouring Amerindian tribes was interpreted by him as purely oppositive, without any particular significance of the Opened and the Closed as such. On this way, Lévi-Strauss considered art works *as 'scale models'*, without consideration for the significant rhythmic of their perceptive-motor and logico-semiotic field effects, conveying singular topologies, cybernetics, logico-semiotics, presentivité. His attachment to the logical excluded middle (binary, Boolean logic) of Aristotelian WORLD 2 was all the more disturbing that logicians of the time were starting to concoct a logic of bundles (Théorie des faisceaux) distinctive of WORLD 3 (Local Anthropogenies, Semiotics, Mathematics and sexuality).

Let us go back one moment on the photos of neurones and neuronal connections of 1902-6. We could have thought that they would put everything back in place and create a new mentality in one or two decades. However, Homo, this indicializing and indexating Primate, has an *invincible preference for the approximate*, the prestigious and unfounded quotation, the sorcery and magic of the speaking and gesturing, and this has been the case since the Mazdean *Avesta* right up to *Harry Potter*. As far as the field of physical sciences, which are the privileged realm of the controllable, Homo took more than two millennium before accepting the implacable experimentations of Archimedes. How long will it take before Homo accepts some evidences concerning his nervous system in humane sciences, where everything is subject to hesitations?

This probably explains the strange misfortunes of **phenomenology**, a particular kind of introspection, not content with speaking in general of emotions, imagination, perception, and aimed at describing differentially what was the *essence* of perceiving, imagining, being moved, and also of caressing (and not rubbing), of socializing by playing with a ball rather than with cubes (Buytendijk), of enduring anguish (without object) rather than fear (that has an determined object), etc. The phenomenological harvest was rich. However, *transcendental phenomenologists* like Husserl and *existential phenomenologists* like Sartre often display such disdain for exact sciences that their most precious observations were soon forgotten, for instance the initial ontological and epistemological distinction : functionings / presence-absence-apparitionnality, that Sartre in 1943's *L'Être et le Néant* had hinted in his confusion of Hamiltonian "consciousness" with "presence".

The Interdisciplinarity between phenomenology and anthropogeny is not easy to describe. The latter is fatally phenomenologizing when it describes Homo's angular body – hence angularizing, orthogonalizing, etc – and also panoplic and protocolar, or indicializing and indexating in the latin sense. And phenomenological too when underlining his holosomy. Nevertheless, anthropogeny never forgets physics and biology. The anthropogenist remains in the fraternity of Peirce, the creator of American Semiotics and the logician of the abduction and the implication, who spent many nights when he was young practicing epistemological and ontological phenomenology with his father, a honorable mathematician, but only before earning his living in an acutely scientific American Bureau of standards and measures.

4. INTERDISCIPLINARITY WITH COSMOLOGY. ETHOLOGY

Homo is not only the *angular primate* to the extent that he initiated Technique and Semiotics. His perceptions and motions continue – whether he formulates this or not – to belong to that of *primates*. Enjoying a *visual faculty* that is appropriate to canopy, thus capable of globalizations, focalizations, acute distributions, and at the same time polychromous fluencies. With still a *hearing system* that is not multi-punctual like that of the Horse, but establishes sound proportions in symmetries and sound depths in echoes. Let us add *tactile receptors* that are not only able to palpate surfaces, estimate weights, suffer pain, but that conjugate multiple layers into *one* substantializing, hedonistically caressing touch.

More primarily, hominoid specimens, alongside their deemed sublime actions, continue to perceive themselves and to move as though they belong to the class of *mammals*, these terrestrial and marine animals that are very *inter-cerebral* and *empathic*, and that constantly seek groupings that are cohesive and favoring subtle hierarchy. Lower, they continue to belong to the branching of *vertebrates* with their mouth/anus, belly/back, gravitationally high / low (protreptical) *polarized space-time*. Still, Homo never ceases to participate the *vegetal reign* with its drive of growth and emergence in the environment. Finally, Homo maintains and cultivates –very vivaciously in Amerindia – a certain feeling of belonging to the *mineral reign* with its *weathering*. Finally, looking at some aboriginal drawings in Australia, Homo has very soon feeled to be a trifling minute relay in the *sidereal* infinity.

Let us briefly follow the three canonic WORLDS of *Anthropogeny*. In ascriptural WORLD 1A, such perseverance of prehomoid and protohomoid states (layers, stages) and faculties organised themselves through totemism and taboos in which the primary empires of scriptural WORLD 1B drew out the contents of their founding epopees. The Greek, fond of wholes composed by integer parts – and the entire western WORLD 2 after them – asked themselves if, during the construction of the human foetus, the mineral, vegetable, animal and rational phases *added on to one another, substituting, replacing, each other*, or if they *subsumed each other*, the last continuing to comprehend the former. Halfway of the WORLD 2, around + 1250, scholastic Thomas Aquinas, who felt that 'forma educitur e potentia materiae' (the form emerges according to the potentialities of the matter, materia secunda and prima) unhesitantly affirmed on several occasions that (except for Christ, Man-God), *foetal forms subsumed each other* in a frankly successive manner (primo, deinde, in fine). This vision of the *doctor communis* seems to belong to a certain hominoid permanent 'good sense', since his view still inspire the WORLD 3 laws on abortion, wich is tolerated during the months of 'mineral, vegetative, sometimes animal' formation before the intervention of the last supposed 'rational' formation.

Fundamentally, every hominoid specimen is globally perceiving himself as a recapitulative (microcosmic) state-moment of a Universe whose habits, characteristics, traits, are consequently to understand in their specificity for understanding Homo as a whole. Those habits are today encountered most frequently by the Physicist, the Chemist, the Biologist. Let us list some of the most fundamental, and may be transcendenatl. (a) Being composed of *energies and differentiations*, according to the formula : $e = mc^2$. (b) Presenting *attractions* (Special and General Relativity) and *cuts* (Quanta, granular structurations necessary to obtain

distinct objects (Schrödinger). (c) Producing formations through *plasticity* but also through *re-sequentiations*, particularly those of amino-acids resulting into proteins through very few *chemical liaisons* (covalent, ionic, hydrogen, hydrophobic) (Local Anthropogenies. Semiotics. Mathematics and sexuality) (d) Realizing '*negentropies*' like those that the Living 'is' (Pierre Curie), while being thermodynamically a 'state faraway from balance' (Prigogine), paid by ambient entropy increases in its environment. (e) Exploiting the seven *catastrophes* (radical changes in forms, strepHein, kata, supposing a singularity) resulting from seven elementary equations of differential topology (Thom). (f) Using *modularity* in such a way that unforeseen organs and functions are created according to the displacement of former biological *modules*, sometimes very archaic (so that the chymotripsine is a leitmotiv in the 1992's *Discovering Enzymes* of Dressler and Potter). (g) Offering two main types of adaptations according to Waddington : one antecedent (*Lamarckian*) and the other subsequent (*Darwinian, Eldredgian-Gouldian*). (h) Producing, rather than *stable or unstable individuals*, ONLY confluences of *meta-stable individualizations* (Gilbert Simondon, *L'Individu et sa genèse physico-biologique*, 1962), etc.

Amongst the necessary (even transcendental) habits (ethos) of a Universe, the most significant for an *Anthropogeny* are those related to the *chance*. Today, physicists and biologists are beginning to use a first comprehensive list of it. (1) The Greek *tukHè* or encounter of heterogeneous suites, such as when a falling tile hits a passer-by (Aristotle). (2) The Latin *chance* (cadentia, unforeseeable fall) that, according to Democrite-Epicure-Lucretius sufficed to give things all their forms. (3) The Latin *fortuna* (fors-fortis), that became the Goddess Fortuna, when the 'maybe' gives 'one fine day that'. (4) The Arab *al-zahr*, parallel to the latin *alea*, the dices, where the number of possible falling positions is known in advance, so giving way to a strict repartition of the gains in an interrupted hazard game (Pascal' calcul des probabilités). (6) The range of mistakes bound to every physical experimentation (Newton's errors theory). (8) In today biology, the resequentiation effects that seem necessary in a second while but are also unforeseeable beforehand, for instance in the case of amino acids forming proteins. This last type of chance, absolutely unforeseen thus far by Homo, and fundamental in a nowadays Anthropogeny, has induced Eble, in a seminal article of Paleobiology (1999), often quoted by Gould, to distinct two kinds of chance intervening in an Eldredgian-Gouldian Evolution Theory : (1) The *statistical one*, (2) The *properly evolutionary one*. The latter being for sure the most revolutionary and disturbing philosophical discovery that Homo has ever made. Rending every previous philosophy strictly non pertinent.

We will have understood that all these 'universe uses, habits' are descriptive, not prescriptive. In Antiquity, the Greek 'ethikè' and its Roman counterpart 'moralitas' were still merely descriptive (meaning the way an individual or a group acts, without any appreciation about it), and only became normative with the *interiority* inaugurated by the Stoic-Christian-Neoplatonim, and then finally, since the 1600s, with the concept of *honesty* bound to the exact equivalences of the bourgeois money, economy, behaviour. Today, in our Universe of *evolutionary chances*, the only *value* of a system is its capacity of *survival*. Whether it concerns mountains, plants, animals or technical or semiotical processes, even social values.

WORLD 1, amongst its taboos and totems, saw and perceived Homo, the angular Primate, from bottom to top, astral, vegetal, animal, technical, semiotical, presentifying, in an almost confusing continuity. The Occidental WORLD 2, that of wholes composed of integrating parts, and with this aim considering the hominoid specimen from top to bottom, as did Plato, Aristotle and Plotinus, considered the Anthropos as generated and even ontologically

deriving of its noblest source (the 'arx mentis'). WORLD 3, the evolutionary one, intends to understand the biological transitions in general, and anthropologically the progressive emergence of the angular Primate from the Primates, Mammals, Vertebrated in general.

Hence the most intimate interdisciplinarity of *Anthropogeny* with **Ethology**, this science of the '*mores*' of the animal world no longer in laboratories, as did the Gestaltists and Behaviorists, but in its natural evolving and proliferating milieux. It was founded by Konrad Lorenz in the 1930's. At first, Lorenz was struck with the Gooses by the *impregnation* (this precocious and definitive attachment provoked by the vision of a first '*pregnant*' object, in the terms of the Gestalt Theorie).

Ethology has been the occasion to set apart several key-notions of *Anthropogeny*. (a) First, that of *stimulus signal*, a complex, imperious, innate cerebral response to a defined exterior or interior stimulus. The obligatory and differentiated phases through which an eagle finally hits its prey according to the races are a perfect exemple of it. And, by contrast, the stimulus-signal has instructed a very good background to point out the originality of the hominoid *sign*, which is borne from *technemes*, non-innate but *technically* sets constructed by the angular body of the angular Primate, then becoming *semiotical* after the suspension of their technical operativity. (b) Later on, ethologists made the enlightening observation that the great Apes had already some native impulse to *exploration*, hence exhibiting an *allostatic* behaviour, confirming the insufficiency of the *homeostatic* models of the time, above all in the case of Homo, still invoked by Freud. (c) Sociologically, ethologists remarked that in some superior Apes, coupling was not purely an instinctive behavior (innate building), but acquired with the vision of 'learned fellows'. (d) Finally, around 1980, Lorenz stated decidedly that "the" Greylag goose, the central object of his research, 'did not exist', 'there are only "singular" Greylag geese', every one having peculiar particularities opened to evolution. A massive affirmation that must today be nuanced by the Eldredgian-Gouldian 'punctuated equilibrium'.

In turn, the *Anthropogeny* attracts the attention of the Ethologist concerning the fundamental difference between the *instrument* and the *utensil*. The *instrument* is common to both animal and man, at least since the sea otter breaks its eggs using stones ; instruments are right complements or supplements of one's body. The *utensil* – as the Latin etymology fortunately emphasizes (*usus*, verbal substantive of the middle voice verb *uti*, to employ but as does a man) supposes that the instrument should be grasped in the field of a *panoply* and a protocol (with their perceptivo-motor field effects), which is characteristic to Homo, as a transversalizing Primate. Unfortunately, paleoanthropologists and ethologist frequently mix up the animal *instrument* with the hominoid *utensil*. Had this distinction been perceived more clearly, when in the 1970s, the Leakey family discovered choppers and bi-faces in Eastern Africa, then Ethology, Paleoanthropology and even Paleobiology would have made great and rapid contributions to Anthropogeny. In fact, the search of fossils is a so absorbing a task that it leaves little time for such anthropogenical subtle distinctions.

All this contributed to the Anthropogeny's increasingly clear conviction that Homo did not present itself as the result of an *orthogenesis*, but in multiple *taxa* and *clads* that were so *heterogeneous* that they could no longer be disposed as simple advances, meanders, temporary backings, but growing in a biological *busl* (buissonnement), where Homo, Homo habilis, Homo erectus-ergaster, Homo neandertalensis, Homo sapiens sapiens appeared as solutions amongst a myriad of others possible. With only the particular chance that Homo is the most angular of all hominoid primates, and even of all beings in our Universe. Hence the most capable

constructing not solely instruments, but tools and utensils disposed in panoplies and protocols. Hence capable of Technique and Semiotics. For new environmental openings and cleavages.

5. INTERDISCIPLINARITY WITH MATHEMATICS

5A. The anthropogenic definition of mathematics

An anthropogeny alone can give an adequate definition of mathematics, emphasizing that Homo is the angular, transversalizing primate – hence indicializing and indexating – and that, in contrast with ever-fleeing lat. *indicia*, the lat. *indices* that he produces have very particular properties. Although they are in themselves *empty signs*, the latter can function as *full signs*, hence as lat. *indicia*, when they signal the physical or mental state of he who emits them, for instance in the charge of an order to begin or to stop a battle. However, they can also – and this is what concerns the mathematician – be *discharged* and *disincialized*, in which case we shall call them '*pure*'.

'Pure' lat. *indices* enjoy a clarity, an inalterable comparability to the point that they can engender ideally *fixed forms* (of geometry) and ideally *fixed numbers* (of arithmetic). On the other hand, they give us a unique case of equipollence between mental content and gestual, spoken, and written expression. To the extent that often the mathematical writing translate exactly and often overlaps, exceeds the mind : "The tensorial (written) calculation knows physics better than the physicist" (Langevin). Today, cerebral imaging almost gives us to see the foundations of this purity when, at the emission of the number 4, we see different cerebral relays switch on according to the type of graphs, phonic, gestual, that's 4 as lat. *indicia*, while some relays remain strictly stable, which we can attribute to the number 4 as pure lat. *index-indicis*.

Therefore, very early on, Homo was invited to produce (at least implicitly) a general theory of pure lat. *indexations* and an absolute practice of pure lat. *indices*. This theory and this practice were so general and primary that the Greek called them 'the learning' as such, the *matHèsis*, hence mathematics. The anthropogenic definition of which is thus : '*mathematics is the general theory of pure lat. indexations and the absolute practice of pure lat. indices*'. The result is all the properties that are usually recognised to mathematics as cultural events: their necessity, demonstrability, and simultaneously magic power and morals that they are linked to in the works of Pythagoras, the Chinese, the Indians, and the Amerindians.

5B. The fundamental constructions of the Universe

The hence-conceived mathematics provided Homo quite naturally with all the ontological and epistemological shaping of his Universe. Indeed, how could he *indexes* (in the latin sense) a Big Bang without the **general topology** of the close and the faraway, the continuous and the discontinuous, the closed set and the opened set, the path and the barrage?

How could he index (in the latin sense) the places and moves of galaxies, stars, planets and their constellations, without the **differential topology** of the seven elementary catastrophes: the fold, the break, the swallowtail, the butterfly, the hyperbolic umbilic, the elliptic umbilic, and the parabolic umbilic? How was Homo to index (in the same sense) energies, masses and speeds of every events before Galileo, or even Relativity ($e=mc^2$) and Quanta, without using **geometry** and **arithmetic**?

It is still mathematics that basally indexes (in the latin sense) the formations of living beings. Whether it is the geometries of formations through **plasticity** (remember Linus Pauling), but also the ordinances of formations by **sequences and re-sequention**, when suites of amino acids build proteins; when other suites build the collecting ARN, the ribosome ARN (which serve as workbench), the messenger ARN, right upstream to the general orchestrating DNA that, we know it lately, are **modulable (re-sequentionable)** by some environmental activities (famines, wounds) into a certain heredity of acquired characteristics (not Lamarckian yet).

Finally, when the Living selected **sexuality** as the surest mean to produce a sufficient amount of adaptive variations, the catastrophes of differential topology again were used to invent co-aptable organs and to give way – using the vertigos inherent to those – to the male ruts and the female heat until they operated the necessary cooptations. (Local Anthropogenies, Semiotics, Mathematics and sexuality)

5C. The original myths

All this probably sheds light on the relation between mathematics and the **original myths**. Not – it is true – in ascriptural WORLD 1A, not even in scriptural WORLD 1b (where the Origin was an Egg in the Orphic Greece) or an archetypal Great Mother (Amerindia). But right when WORLD 2 begun. In his *Timaeus*, Plato assures us and himself that the Cosmos is good and beautiful. Hence, his Demiurge – who is thus beautiful and good – could only make it by contemplating – in the panoply of eternal Ideas – regular polyhedrons, sources of every 'normal' object. (Local Anthropogenies, From Metaphysics to Anthropogeny)

How about risking a myth of origin for evolutionary WORLD 3 ? Let us suppose that the Evolution has reached the superior Primates, with their fingers, their vision and their hearing. What resource would this Evolution still have to implement novelty, like for example Technique and Semiotics? If we think about it, there is only one solution : the **angle**. Before Homo, there is nowhere in the Universe where we can find a single right angle, not even any angle that is ever so slightly tense or decided than those of the human body, at least not in the dimensions of practicable time and space (to exclude the spins of Quanta mechanics). On the contrary, when we suppose settable angles, within practicable dimensions, everything can result. First, an **operative Technique**, very soon joined by a **Semiotics** through the desoperativity of technical relations (and references).

And for a while let us think biologically. What is more anatomically realisable than the angle, when we already have the great Apes and their articulations that are inchoatively angular and that have been selected since millions of years to pick the fruits in the canopy and to jump from one tin branch to the next? We only had to wait for a few more million years before the evolutionnary Variation and Selection (gradualist or punctualist) ended up anatomically and

physiologically set, in the hands and feet and in every articulation of the limbs, angles that are increasingly regulatory, grasping – yes – obtuse, acute, right angles, to the extent of inaugurating humane anthropogenic 'WORLDS : 1 (continuous close, 2 (continuous distant), and 3 (discontinuous), with different topologies, albeit with three dimensions, the three so-called 'normal' dimensions between them : width first, then height and depth. Width is the most 'anthropogenic' dimension. Indeed, as it is transversalizing, it will dispose any hominoid environment into panoplies and protocols. Right to the transversality of the Cartesian coordinates where all Galilean 'products' – the 'elements' of the Universe – will strictly position themselves, thus technically.

5D. Conceptual Mathematics

How satisfying it would be for the anthropogenist to have at his disposal a mathematical system making all these cosmogonical virtues of mathematics at the hand and sensitive ! Now, since the 1950s, this mathematics exists. It is called *Theory of Categories*. And the anthropogenist can use it today in the form of an essential exercise, not solely a simple vulgarization, in Lawvere and Schanuel's *Conceptual mathematics* published by Buffalo Workshop Press (1972).

The two first lines already anthropogenize and cosmogonize at one's liking : "We all begin gathering mathematical ideas in early childhood, when we discover that our two hands match" ; that's for the *angular articulations of Homo's body*. Then, "and later when we learn that *other* children *also* have grandmothers, and then that 'uncle' and 'cousin' are 'of this type *also*'" ; that's for the social enunciations of Homo, but also for the *sequentiations and resequentiations* in general (thus as mathematical event). Furthermore, the following Preview of the book, *Galileo and Multiplication of Objects* is no less anthropogenical, as it shows Galileo create mathematical Physics by trying to write (draw) the flight of a bird and noting that, in his projection, the *product* (of the direction and speed) precedes the *sum*. So much so that, in the Theory of Categories, the sum is defined by the reversal of the arrows defining Multiplication. Here, you see, the categorician mathematician has become ontologist, saying and seeing that any 'world event' is first a '*Product*'. The product is, in last resort, the metaphysical definition of the *event* ; so French and Latin use the phrase : 'il s'est produit quelque chose'. And why arrows? Because in mathematics, which is anthropogenically the general theory of pure lat. indexations and the absolute practice of pure lat. indexes, everything can be said using arrows (Local Anthropogenies, Phylogenesis, *La mathématisation de la flèche, with René Lavendhomme*)).

And *Anthropogeny* goes from mathematics to logic, when the Theory of categories offers a *ory of bundels* (théorie des faisceaux) that will be of much use to the WORLD 3 logician to express that every event requires multiple viewpoints – or infinite viewpoints – right up to iridescence. In opposition to western classical 'strong logic', supposing the axiom of the excluded middle (the third excluded), that had served Aristotle as a preliminary of all scientific knowledge of WORLD 2, WORLD 3 favours 'weak' logics that are called 'intuitionists', 'synthetic', 'without excluded middle', and therefore capable of moving within the nilpotent elements of the continuous (Grootendick, Lawvere) and then to axiomatize the right

line (René Lavendhomme, *Basic Concepts of Synthetic Differential Geometry*, Kluwer, 1996). More generally, the mathematics of the *Theory of Categories* encourages to envisage a Logic of the topos, called *Topos theory*, which unconsciously we practice everyday in our daily languages. The latter almost never used strict Boole's binary algebras of the excluded middle supposed by our digital computers, but indeed often plays with Heyting algebra (without excluded middle). The topos theory can be said in French une "théorie des univers de discours" (see René Lavendhomme, *Les lieux du sujet*, Seuil, 2001).

In Physics, this logic is the sister of the Theory of *emergences*, which is nowadays experiencing some regain of attention among the physicists. It sounds like this. 'There is no Universal law of physics. Every physics law is a viewpoint on the Universe'. Feynman already insisted on this view in his classic 1963 *Lectures on Physics*, in which he offered not to teach Physics – that the selected Caltech students were supposed to know in advance – but to suscitate physicists, and then starting with insisting on the arbitrary of measure standards in exact sciences. In the previous generation, Dirac, who discovered positron and anti-matter, had more fundamentally pointed this relativity when he remarked dryly as ever to a fellow train traveller who had murmured, looking out of the window : "There are some freshly-shorn sheep" : "Yes if you look at them from here". In any event, all the recent biological orientations undoubtedly point to a "bushy", stricto sensu evolutionary Universe made up of punctuated equilibria (Eldredge-Gould). Potulating categorical theories of the bundles.

After all those breedings between mathematics, physics, the arts, erotic, and mystic, we shall not be surprised that, a few weeks before succumbing to a fatal brain haemorrhage, Eilenberg, who was then professor of mathematics at Columbia (where he was free to teach anything he liked for his salary) confided in the author –with insistence – that the following academic year he intended to go to teach Chinese painting. Indeed, what a better occasion than *Kouo Hi*, the most essential painter of human history, to experience that, with Homo and the Universe in all their common dimensions, there is topology before geometry, and that the former is general before being differential.

5E. Mathematics as a model for other kinds of anthropogenical interdisciplinarity

The author – who is not a mathematician – and René Lavendhomme, a mathematician who happened to be categorician and toposist, and fond of Anthropogeny, were acquainted during 53 years. Six weeks before his death, René stopped his car in front of the house, and taking in some of the precious breath from his oxygen bottle, turned to the author and said: 'To think that, for ten years, I heard you say that *mathematics is the general theory of purelat. Indexations and the absolute practice of pure lat. indices* (silence) and I did not understand'. This is a good demonstration that, even in the course of a long-running relationship, indisciplinary is neither immediate nor direct. For ten years, the mathematician had sufficiently accepted the anthropogenist's definition of mathematics when the latter would repeat it in front of his auditory, but without fully situating it in the system; something he only did four of five years before this surprising declaration.

This dictates the pluridisciplinary practice of the anthropogenist. His texts – when committing a specialisation - must be reviewed by specialists, who will be alone in perceiving that something is inadequate, either by incomprehension, by excess of generality, or still, by limited viewpoint. Any suspicion or frank unease of one specialist will exclude the proposition, or will at least be clearly signaled as controversial. However, it would be sterilizing that the simple suspense of the specialist should prevent from going forth. Gould and Eldredge have a long time must share this attitude about the 'punctuated equilibrium' that in their opinion was the key of a Macroevolution that is something else than an extrapolation of the Microevolution as Darwin wanted it. It is probably with this care in mind that René Lavendhomme did not say anything to the author about his incomprehension. Because it is possible to have admitted something, and even to have admitted it quite surely, without having completely understood it. This is what happened to Poincaré when, he tells us, he stepped on the step of a Paris bus and was enlightened with Fuchsian functions. He roughly moved them around as he took his seat, and then checked them thoroughly – meaning that he 'wrote' them down clearly at his desk that evening. For the anthropogenist, the specialist, limited by his speciality, is heard respectfully, further he is absolutely necessary to consult, but in sile distance. British scholars say ironically : eager of finding something new, do not ever follow the advice of an Oxfordian professor. That was the case of Stanley Miller perseverating in his experimentations about the possibility to obtain amino acids in laboratory conditions.

6. INTERDISCIPLINARITY WITH FUTUROLOGY

The *Anthropogeny* is in no way *futurological* insofar as it is Darwinian, and even Gouldian-Eldregian. It sees the Universe and the Living as being radically evolutionary, and does not envisage any means of foreseeing any future, either at long or middle term, not even at short term. Futurologists, when they insisted on the current wearing out of resources and the fragilities of the Planet and the Species, on the powers and risks of a technique that had become transformational through the Matter (in nano-engineering) and the Living (in geno-engineering), conduct a useful task that is necessary to enlighten the political deciders and pedagogues, or simply to reassure the citizen in his ordinary choices. Yet, their reflections, which are fragile and fatally prescriptive and normative, are short or out of the scope of Anthropogeny.

In 1962, the alarming previsions of the Club de Rome and the reassuring forecasts of the Sciences Academy of Russia had made futurology fashionable among scholars. The author had to review a book by Nobel Prize Thomson, whose the frank title was *The Foreseeable Future*. Nothing – or almost nothing – turned out to come true in the end. Yet, at the same time, the author's **Le Nouvel Age**, which did not allow itself any anticipation, was content with seeing the present of the era to exhibit solely novel processes and objects, and supposed that, in a biological, technical and semiotical Evolution, the truly new has greater chances of belonging to breakthroughs, albeit under unforeseeable forms and restrictions. Today, almost half a century later, *Le Nouvel Age* can still be read without laughing, because of its **descriptive character in the present tense**, for instance when it considers that the passage from *energy machines* to the *information machines* during the Second World War was a major anthropogenic hinge. Without deeming it good or bad, and recalling that a modification of that extent can give way to results that will one day be incompatible among one another, hence self-destructive. (Local Anthropogenies, Phylogenesis, Priority of Technique, *Le Nouvel Age*, 1962)

Since 1980, the *Anthropogeny* has further radicalized this mere descriptive intention of the *Nouvel Age*. Its aim is to go back (as much as possible) into the morals (habits) of the Universe and the ways of the Living as such, stressing the specificities of Homo, in particular its singular faculty of an angular Primate, which is thereby angularizing, orthogonalizing, indicializing and indexating, etc... with the innovative and paranoid possibilities and innovative restrictions hence implied.

Today, this epistemological and ontological attitude takes on a new interest, since prejudicial questions concerning the Living – and even the Planet Earth – rear their heads in every domain, and that globalized media make this questioning shared by almost everyone. It is no more too abstract to look at the Atlantic Gulf Stream and the Pacific Humboldt Stream to know that their salt content is either increasing or decreasing, and that they are either slowing down or accelerating, or even to perceive that everything known decidedly 'humane', or neolithic, occurred in a short Interglacial Period that begun 13,000 years ago.

Our cosmological situation is made even more tense biologically that Homo sapiens sapiens is a *sub-species* that (since the disappearance of the Neanderthal man around 25,000 years ago) exhausted its *species* (Homo sapiens sapien) and even its *genre* (Homo), hence

limiting its natural capacities of adaptation. These questions and answers change every day, every hour, and innumerable teams and publications delve on it, trying to crossover the longest term with the shortest as they are increasingly intricated. An *Anthropogeny* should not meddle in it.

However, it can be not only speculative but also useful envisaging the initial and congenital faculties that Homo would have when faced with extreme situations. In reason of their extremity itself. The angular primate, who is primarily lat. indicializing and lat. indexating, nourishes short and paranoid visions in an almost invincible manner. Yet, at the same time he is possibilizing. And thus it is not completely excluded that, under the effect of extremely violent questioning, he should display aptitudes of attention and cooperation unknown until now. From the beginning of the times on, his madness was technically and scientifically so limited that, when he was delirious, his 'Mother Nature' could reestablish a sufficiently viable order sooner than later, and that he had no need to dig himself into his last resources, even in the event of a black plague. Today, his delirious powers are quasi illimited technically and semiotically. With almost irreversible mad consequences. But, why not, for unknown resiliences too.

Around thirty years ago, a handful of top scientists were asked whether they believed that, at the same time in the Universe, there could be civilisations of our kind. A frequent reply sounded that it was not excluded, but that any civilisation that had reached the stage of ours was probably fatally *self-destructive*. Today's Homo could well have to verify the part of truth and error in that intimidating statement sooner than he thinks.

Henri Van Lier, 2007

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