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Culture as the natural history of *Homo sapiens:* pluralism, memory, creativity*

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Summary

A full century before Darwin, Linnaeus placed firmly our species in his classification of the animal kingdom, assigning it to the Primates, together with monkeys. To this day, however, *Homo sapiens* has retained a position of privilege, despite the advent of evolutionary theory: in many phylogenetic trees, the highest branch is reserved for our species. Nevertheless, anatomy and physiology do not ignore the structural and functional faults of our body, which suggest a more articulated vision of biological evolution. This opens, or reopens, the possibility of evaluating the distance that separates man from his closest cousins not in terms of genes, presumed custodians of a program for development, but of culture and its fundamental tool, the language. In fact, human history is has been running through a plurality of languages and cultures. Fascinating parallels emerge between biological species and human languages, parallels that also reveal their fragility and disclose the fast decline of their diversity, increasingly due to behaviors adverse to our nature of cultural animals and eventually stifle our creativity.

Keywords: *Cultural disparity, cultural diversity, human languages, intellectual freedom.*

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Riassunto

La cultura come storia naturale dell'*Homo sapiens: *pluralità, memoria, creatività

Cent'anni prima di Darwin, Linneo ha trovato all'interno del *Systema Naturæ* un posto per l'Uomo: con le scimmie, nell'ordine dei Primati. Fino ai nostri giorni, tuttavia, *Homo sapiens* ha conservato una posizione di privilegio: in molti alberi genealogici del regno animale, alla nostra specie è riservato il ramo più alto. Peraltro, l'anatomia e la fisiologia non ignorano le imperfezioni del nostro corpo, che sembrano negare l'efficacia della selezione naturale darwiniana e suggeriscono una visione più ricca e articolata dell'evoluzione biologica. Così si apre, o si riapre, la possibilità di valutare la distanza che separa l'uomo dai suoi più prossimi cugini non già in termini di geni, presunti depositari di un programma per lo sviluppo, ma di cultura, a cominciare dal suo strumento fondamentale, il linguaggio. In realtà, quella dell'uomo è la storia di un pluralità di lingue e di culture. Qui emergono affascinanti parallelismi fra le specie biologiche e le lingue umane, parallelismi che rivelano anche la fragilità delle une e delle altre e lo spettro di un sempre più veloce declino della loro diversità, anche a causa di nostri comportamenti che minacciano di intaccare la nostra stessa natura di animali culturali e di soffocare così la nostra creatività.

Parole chiave: *Disuguaglianze culturali, diversità culturali, lingue umane, libertà intellettuale.*

Among the many uncertainties of modern humans are the different and often contradictory perceptions and opinions on what the relationship between man and nature can or should be. We are often willing to concede that man is part of nature (if not, what would man be?), ready however to consider nature as the often hostile context in which humans find themselves living and operating. We are not on firmer ground when we say that a human behavior is 'natural'. Sometimes this turns out to be a positive evaluation (what is according to nature is good, but in the Garden of Eden our ancestors let themselves go to different choices), other times, on the contrary, 'natural' stands for primitive, lacking in that originality that derives from practicing reason and arts. This ambivalent attitude towards nature is not resolved even in terms of the usual contrast between man and animal. In fact, it is easy to fall into the so-called naturalistic fallacy, which leads us to believe that whatever behavior is also exhibited by other species is good for our one, thus forgetting that each species has its own different history and different relationships with the environment in which it lives; except, also and above all, to prepare for an afterthought, when we learn for example that infanticide is frequent in many species, including lion, an 'untouchable' species in our imagination.

It may be interesting to point out that the success of evolutionary theory, to which popular historiography attributes the merit (or, at least, the responsibility) of having finally placed man in his rightful place in nature has failed to produce the perhaps expected change on our ambiguous attitude towards nature.

But perhaps, even from this point of view, it is worthwhile to distance ourselves from easy affirmations, generalized too quickly.

Let's start with Aristotle. In the many pages of his works that deal with animals, there is space for a few hundred different species, terrestrial and aquatic, with blood (vertebrates) and without blood (invertebrates), and among these species there is also man. If Aristotle reserves a prominent position for our species, however, it is not to indicate its singularity or, perhaps, the distance that separates it from the others, but only to make it easier to know the latter: "First of all, then, we will consider the parts of the human body; for, as every one can best understand the standard of money with which he is most familiar, so it is in other things. And of necessity, man must be the best known to us of all animals." (Aristotle, 1883, Ch. VI, 491a19 ff.).

The same intent motivates Belon (1555) who, in the mid-sixteenth century, in his work on the natural history of birds, proposes a very lucid comparison between the human skeleton and the skeleton of a bird, illustrated on two opposite pages, where the individual bones (*e.g.,* humerus, radius, ulna, femur) are marked with the same letter (or the same pair of letters) on both skeletons. This is an exercise in comparative anatomy that anticipates the official birth of this discipline by over two centuries. Within our discourse, however, its value lies above all in emphasizing that man is one among the many living species. Once this point is fixed, the problem to be faced becomes that of fixing the place that the science of nature can recognize for the human species.

To a large extent, a good answer to this question was given by Linnaeus, a century before the publication of Charles Darwin's *Origin of Species* (Darwin, 1859). In the first edition of *Systema Naturæ*, Linnaeus (1735) did not hesitate to place man (*Homo*) within the class of mammals, more precisely, in the order of primates, together with monkeys (*Simia*).

Opening his systematic catalogue of natural productions, Linnaeus deals with animals first, followed by plants and minerals, in the order. Within animals, the first class treated is mammals, followed by birds and, one after the other, all other groups up to worms. As expected, within mammals the first place is reserved for primates and, within the latter, for the genus Homo. This means that Linnaeus, while recognizing the particular similarity that exists between man and some animal genera, does not give up keeping them the first position within the *Systema.*

Whether this last choice is compatible or not with an evolutionary reading of the living world, this is a problem that subsequent authors will have to face. The fact is that the position of man within Linnaeus' zoological classification expresses a much more naturalistic (less metaphysical) attitude compared with that of the Swiss naturalist and philosopher Charles Bonnet. Roughly in the same years in which Linnaeus used for the first time the binomial *Homo sapiens* as the scientific name of our species, Bonnet (1745) imagined a long ladder (*scala naturæ*) ascending from the primitive elements (fire, air, water, earth) through minerals, plants and animals with a simpler structure, up to vertebrates, to finally culminate in man, above which there are the angels (on the subject of

ladder and tree metaphors, see the classic historical essay by Barsanti, 1992). Unexpected perhaps, remnants of the ladder of Nature persisted after the emergence of Darwinian evolutionism and even survive to the present day. In a brilliant collection of essays, published just three years after the first edition of the *Origin* and translated soon into Italian (1869), Huxley (1863), who was called Darwin's bulldog for his aggressive defense of the evolutionary view of the living world, drew the skeletons of four apes (gibbon, orangutan, chimpanzee, gorilla) together with a human skeleton, in a linear series that seems to foretell modern cartoons where the quadrumane ancestor gradually takes the erect position until he stands upright in human form (except then, perhaps, to curl up again to use a computer more comfortably). A few years later, the German zoologist (Haeckel, 1866, 1874) published phylogenetic trees (representations of the possible kinship relationships between the different groups) in which there was a place for humans, in a branch also leading to apes, but the twig that corresponds to our species was placed anyway at the top of the tree. Moving rapidly up to the present day, it is sufficient to note the frequent contrast between lower animals and higher animals, where the two comparative adjectives refer, implicitly but undeniably, to the lesser or greater proximity to our species (Rigato and Minelli, 2013). Aristotle and Belon took the latter as a term of comparison, to facilitate the knowledge of lesser known animals by referring to the most familiar species of all; instead, in these old and new depictions of the ladder of nature, it is taken for granted that our species is the most perfect of all. That this is far from the truth is demonstrated by the many examples of the poor efficiency or even unreliability of some anatomical and functional aspects of our body. An example is the crossing between the alimentary and respiratory tracts that causes the risk of suffocation; this is a problem that many animals do not run, like insects, where the respiratory tract is represented by tracheae that open, with some pairs of pores, on the sides of the thorax and abdomen and do not cross with the alimentary canal (Held, 2009).

Yet, despite the kinship with the other animal species, a genealogical link we cannot doubt anymore, and the structural and functional limits that *Homo sapiens* manifests, both the uniqueness of our species and the exceptionality of many its qualities and performances are undeniable. Beyond the opinions and feelings of the common man and the suggestions that can come, for example, from philosophy or religions, what can natural sciences say about this?

The great popularity enjoyed by molecular biology today could suggest looking into the genes for the basis from which derives the uniqueness of our species. After all, is it not true that everything is written in your DNA, as we read in newspapers and in television advertisements? But this research is destined to bear little fruit. Fortunately for us, this alleged molecular determinism does not correspond to the real facts. Genes alone are not enough to specify what will be the characteristics of an individual. In many animals, even a macroscopic difference such as being male or female is determined by the environment rather than by genes. An alligator, for example, will be either male or female depending on the temperature to which the animal is exposed during incubation, in a

sensitive period of its embryonic development. Of course, the comparison between human genomes and the genomes of other species has put a stop to the old diatribes about which species among the apes is the closest to man (Ruvolo, 1997), but the genetic differences found between humans and chimpanzees are not sufficient to explain all human peculiarities.

Perhaps, at this point, it is worth taking a step 250 years back, to follow a different path that can lead us to characterize man compared to all other animals. We can still find an important suggestion in Herder (1772) who 250 years ago identified language as the true unique prerogative of our species: man is a 'linguistic creature' both in the sense of creator of language and as a creature of language.

In my view, this suggestion finds particular meaning and relevance if it is interpreted and extended in terms of natural history. That is, language and the plurality of languages as the core of the natural history of man.

On the one hand, this program takes up a suggestion of (Linnaeus, 1758) who, instead of enumerating a series of morphological characters as for all other species, merely provided the reader with the following lapidary diagnosis of our species: *Nosce te ipsum* —repeating in Latin the Socratic γνῶθι σαυτόν, know yourself.

On the other hand, we shall not forget that for some animal groups (birds, especially songbirds, but also frogs, crickets and grasshoppers) natural history gives ample space to the study of vocalizations and their possible variations. In man, however, we are not simply faced with a phenomenon of extraordinary importance and of unique complexity in its phonetic, grammatical, syntactic and semantic aspects, but also with an aspect of the natural history that provides an exceptional example of both dimensions of plurality in biological phenomena: diversity and disparity.

The most widely used measure to express biological diversity is the number of species found in a given environment or in a given geographical area: as a rule, this number does not refer to all the living beings present in the area or in the environment considered (a target practically impossible to obtain, even in a restricted local area), but it applies to selected groups of animals or plants, for example birds, butterflies or flowering plants.

Different is the meaning attributed, in studies of this kind, to the term disparity. It corresponds to the degree of heterogeneity of the forms or ways of life of the species present in the group of organisms we are considering. Beyond definitions, which are not easy and perhaps not sufficiently precise, the difference between the two concepts can be easily drawn by comparing mammals with birds. On a global scale, the number of mammal species recognized today is about 6 400 (Burgin *et al.*, 2018), while birds species are close to 11 000 units (Gill *et al.*, 2022): the comparison between these two numbers indicates that the diversity of birds is higher than the diversity of mammals. However, in terms of disparity the relationship is reversed. Almost all birds are built according to a very similar structural plan, to the point that the experience of a zoologist is not required to decide, at first glance, whether or not an animal can be re-

ferred to this group. This includes less typical species such as ostriches, with their reduced wings, and even penguins, whose short but strong wings are used for swimming rather than for flying. On the other hand, the disparity of mammals is easily suggested by a short list of representative species, such as mouse and kangaroo, bear and giraffe, mole and tiger, armadillo and elephant, not to mention bats and whales, whose belonging to mammals, rather than to birds or fishes, respectively, was definitively ascertained only in modern times.

In addition to animals and plants, the notions of diversity and disparity can be applied in the comparison between languages and other aspects or tools of human culture. I will give here only a few examples relating to languages and numbering systems.

In terms of diversity, a precise estimate of the number of languages spoken today in the different corners of the Earth is practically impossible, for two main reasons. First, to attribute two slightly different speech systems to the same language, or to treat each of them as a language in its own right, this is sometimes an arbitrary choice. Second, day after day the total number of languages spoken in the world continues to decrease (Nettle and Romaine, 2000; Harrison, 2007; Evans, 2010); same for writing systems (Baines *et al.*, 2008). As in the case of the no less dramatic extinction of animal and plant species that is taking place before our eyes, also in the case of languages the causes are multiple. In the individual cases, this decline is more or less natural or results from policies that, intentionally or by secondary effect, favor the dominance of a common language to the detriment of those that have been spoken by individual communities up to now (Ostler, 2005): as icastically expressed by De Nebrija (1492) in the first printed grammar of Spanish, *siempre la lengua fue compañera del imperio.*

In any case, current estimates of linguistic diversity globally indicate numbers between 5000 and 6700 units (Nettle and Romaine, 2000). Of this number, the vast majority are located in some areas such as Central Africa (427 in Nigeria, 270 in Cameroon, 210 in Zaire), Southeast Asia (160 languages in the Philippine Islands, 137 in Malaysia), Australia (250), Mexico (240), Brazil (210) and, above all, Indonesia (670) and Papua New Guinea (860!), with very significant numbers also in archipelagos of Oceania such as Vanuatu (105 languages on an area of 12 200 km^2) and the Solomon Islands (66 languages on an area of 28 400 km^2). The descriptors we could use to characterize language disparity are many. An example are grammatical cases, a feature that unites, for example, Italian and English on the one hand, Latin and German on the other. In Latin, the *rosa* of the nominative case (in which we express the subject of a sentence) changes to *rosæ*, to express what in Italian we say with *'della rosa'* or *'alla rosa'*, without changing the noun. And even a seemingly less specialized part of the sentence, such as the object complement, sees our *rosa*, invariable in Italian, become *rosam* in Latin. From this point of view, English behaves like Italian, German like Latin. Even remaining on this single example, it could be added that the number of recognizable cases in Latin is different (higher) than in German, while a larger comparative study would reveal different and even more complex forms of declension of nouns.

But it is perhaps in numbering systems that we can find the most striking examples of disparity, starting with a comparison of the names of two-digit numbers, in our decimal system. Here are two examples:

- 91 in Italian, German, and French is, in order:
  novantuno $= 90 + 1$,
  einundneunzig $= 1 + 90$,
  quatre-vingt-onze $= 4 \times 20 + 11$,
- while 19 in Italian, German, and Latin is, respectively:
  diciannove $= 10 + 9$,
  neunzehn $= 9 + 10$,
  undeviginti $= 20 - 1$.

The names that indicate this same number in different languages express very different mental operations, even if in all these cases they are based on the decimal system. The latter would seem so natural, being based on the total number of fingers of our hands, that it would easily be a universal basis of all numbering systems, but it is not so. Base-5 systems are less surprising, as there are five fingers on one hand, but there are also base-4 systems, based on different choices: four, in fact, are the spaces between the fingers of one hand, but four are also one hand's fingers except the thumb. Moreover, by pointing additionally to other significant parts of the upper limbs, some peoples have developed numbering systems *e.g.* base-6 or base-8 (Harrison, 2007).

When comparing languages, it is necessary to pay close attention to the distance that separates spoken but unwritten languages from those for which, in addition to the spoken expression, there is also a written version. It is quite easy to demonstrate how the written language, which is obviously derived from the spoken language, has retroacted onto the former, changing not only its use, but the very conscience or perception of its nature and structure (Scholes, 1993). Schole's experimental works and those of Willis (Scholes, 1991; Scholes and Willis, 1986, 1987) show that the progressive development in grammatical complexity traditionally observed in the course of speech learning is not found among individuals who never learned to read and write.

It is also worth mentioning here that the spaces with which we separate written words are not used by all writing systems and, indeed, were not always used in writing texts in 'our' languages in past centuries (Saenger, 1997). Young children tend to write without spaces between words, perhaps because this seems to better reflect the continuity of the spoken word (Saenger, 1997). The Slavic languages written in the Cyrillic alphabet did seriously pass to the separation between words only at the beginning of the seventeenth century, the Indian languages derived from Sanskrit only in our days. It is certainly not without meaning that some languages such as LoDagaa of Upper Volta and Gonja of northern Ghana that do not have a word meaning 'word' (Goody, 1971). May we suggest that, in a sense, it is grammarians that invented words? (Minelli, 2015).

Let us return to Herder, to language as a cornerstone of the natural history

of man, a feature subject to unceasing change, like living species. Change of which more or less distinct and decipherable traces remain, easier to collect and compare when they are translated into written documents, or in the other monuments of human culture.

Just as the natural history of living species recognizes an important space for the memories of the past represented by fossils, so in the natural history of man there is a place, in addition to the study of the languages spoken today and the concern for the continuous reduction of their number, also for to the conservation and study of cultural monuments of all times. Monuments that preserve a memory that too often turns out to have been lost, or deliberately canceled, or at least made inaccessible. All this represents an impoverishment of the diversity and disparity of our cultural heritage.

Lost is the memory of documents finished in fire or sent to pulp without keeping at least one digital copy; lost is the memory of the many works that Kelly (2005) evokes in his astonishing and distressing collection *The Book of Lost Books.* We may be comforted by the fact that, among those lost books, some have never seen the light as finished works licensed by the author. Real drama is the erased memory, like the Buddhas of Bamiyan. We will never know precisely the last copy of how many of the books listed in the *Index librorum prohibitorum* disappeared before the *Index* was eventually suppressed in 1966. All in all, the very fact of being listed there may have helped preserving them, at least in the library of the Office in charge.

But the history of past centuries is full of parallel events, exceptions, surprises. A large collection of prohibited books is found in what was once the home of Giacomo Leopardi in Recanati, a collection that was available to Giacomo and his sister Paolina because their father, Count Monaldo Leopardi of undisputed Catholic faith, not only bought them as part of the very rich family library, but asked (and obtained) for his children from the ecclesiastical authorities exemption from the prohibition of reading such works. An example all the more noble and courageous when compared to the rampant tendency to erase the memories of the past, to smooth out the light and dark of the cultural heritage of past centuries to the point of destroying them completely. Today, if fire is not used to annihilate documents, the formally aseptic procedure of filing is used. Moreover, in our days we are witnessing the spread of two behaviors that apparently follow opposite paths, but in the end converge in producing devastating effects for the survival of our memory.

One of these two threats that progressively undermine what we have defined as the backbone of the natural history of man is the policy of delegitimation and, in the end, cancellation of increasingly extensive temporal strata and cultural components of our past, of documents of a disparity that represents the heart of our cultural richness. Beyond the macroscopic aspects, of which I have already indicated two examples (the destruction of the Buddhas of Bamiyan and the overwhelming of some dominant languages over an increasing number of languages spoken by few), the thousand forms of delegitimization that are now beginning must be denounced. This trend is evident even in contexts that could

be believed to be free from similar ideological drift. I give here just one example, from a bibliographic search I made recently through the Biodiversity Heritage Library (BHL). This precious website is the most important access route to the zoological and botanical literature of the past, excluding recent works covered by copyright. The BHL brings together the digitization efforts of many large libraries from different countries, offering researchers the possibility of direct reading from their computer screen, or downloading the entire work or obtaining any selection of pages free of charge. Naturally, scanning of the original, printed texts was performed mechanically, so the documents we can read or download contain copies of bindings, blank pages and any advertising inserts. Unexpected, however, was my discovery of a copy of a card with the following text: "Historic, archived document. Do not assume content reflects current scientific knowledge, policies or practices." That is, this is not a forbidden book, but it could be. I immediately reassure the reader about my bibliographic research: the small book tagged this way is a copy of Pierre-Antoine Renault's *Flore du Département de l'Orne* (Renault, 1800?), a harmless botanical book from the early nineteenth century. The digitized copy belongs to the United States Department of Agriculture.

In September 2021, a link to a new statement appeared on the BHL home page, which I report here in full:

> "Acknowledgment of Harmful Content. The Biodiversity Heritage Library acknowledges the existence of harmful content in many biodiversity science publications and original materials included in its collection. We are reckoning with the, at times, painful heritage of our collection and seeking to address its impact on science and culture today. As a curated digital collection aggregating content from hundreds of providers into a single platform, BHL is a reflection of the historical collection development decisions of those providers as well as the publishing practices and historical colonial processes that have shaped the scholarly record of biodiversity science. Scientific understanding evolves over time, through critical analysis of new information and scrutiny of its mistakes. We recognize that as a free and open access digital library, we simultaneously increase and promote access to materials, some of which espouse deep prejudices that are counterproductive to the advancement of scientific knowledge and overshadow the contributions of marginalized peoples across the globe. At best these views are outdated; at worst, the legacy of natural sciences is unjust and inhumane. The harmful content in BHL's collection goes against the values of the Biodiversity Heritage Library. It is provided for access as part of the historical record."

Until now, there are no signs that this policy will lead to the actual removal of works from the BHL catalog.

Much more effective, in limiting our access to a large part of the cultural heritage of mankind, is instead a strategy that apparently seems to facilitate access

to products of particular relevance to each of us. These are the 'suggestions' that appear on our computer, or on our mobile phone, immediately after we have made a purchase, or even just a search online. Based on our choices, an algorithm draws up a profile of our interests and is ready to guide us in the subsequent navigation on the web. Step by step, this profile becomes a bubble within which we are sequestered more and more tightly. Thanks to artificial intelligence, the prisoner has fewer and fewer opportunities to use his own, unless, sooner or later, his remaining creativity rebels and prepares to explore the world with the naivety of a child moving his first steps through the wide world (as the fables of old times said). Opposite to guided navigation within the seductively iridescent bubble of our digital universe is the exciting exploration of an open shelf library (Minelli, 2021). Here you may find a copy of the book you were looking for and, perhaps, further related titles, but —more important— you can wander from one shelf to another only guided by curiosity and pick up a book you had never seen before, before moving to another shelf nearby, where you will discover wonderful books whose existence you could never imagine.

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