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-- BIPEDIA - BIPEDIA n° 10 --

BIPEDIA
n° 10

BIPEDIA 10.1

# IN SEARCH FOR TAXONOMY AND RELATIONSHIPS IN THE VERTEBRATES,

in connection with the Marine Homonculus hypothesis

François de Sarre

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**Résumé :**

Carl von Linné was called "the father of taxonomy", i.e. the science whose purpose is to classify the living forms, to categorise them into classes, orders and genera. The well-known Swedish naturalist made an attempt ( in his Systema Naturae, 1758 ) to base his classification of animals and plants on features which can easily be established. The criterion first retained for the arrangement in the groups was that of an increasing complexity in organic structures. Linné's model was a static one, without any evolutionary implication. Man, who was placed

in this system beside the apes in the order of Primates, was not said to have descended from a common Simian ancestor to both the monkeys and the genus Homo. The Linnean taxonomy was resumed as a whole by scientists like Maupertuis, Buffon, Lamarck, Darwin and above all, by Ernst Haeckel, the author of the famous phylogenetic trees ( 1868 ). The ordinary classification of the animals and the plants, previously looked upon as a register of names or as an index, was considered from then on as a genealogical affinity table of the several classes ( Mammals, Birds, Reptiles, Amphibians and Fishes ) which formed the Vertebrates' groups. The classes, orders, and genera corresponded to the boughs, branches and sprays of the big tree of the living Vertebrates' forms. So Haeckel actually put all the Vertebrates into on row in graduating process going from the very beginning of the first forms of Fish up to the Mammals, going through the Amphibians as well as the Reptiles. This phylogenetic model was established, too, in order to give Man the advantage of becoming the final state of evolution, "the finest jewel in the crown", according to the current philosophical tendencies, and in full respect of the Darwinist dogma. The aim of the present article is to suggest the idea of a revision of the Vertebrates' taxonomy, at the daylight of the newest data in modern science and through the theoretical and plausible framework of a supposed original bipedalism among Vertebrates. Our usual sight of view in classifying the groups of Vertebrates badly needs an entire revision We must progressively free ourselves from the traditional habits in taxonomic science, left to posterity since more than two centuries. Just as it was the case only a few decades ago with the worms ( Vermes, a group now splitted in several non-related taxons ). Of course, since we have been talking of Vertebrates, and no longer of worms, it has been touching the right spot, our sensitive one. The evolutionary model called Initial Bipedalism Theory suggesting that the first Mammals were bipeds and issued from Amphibian stages, as well as the author's personal Marine Homonculus Hypothesis of a bipedal and big-brained pre-Vertebrate once entering land allow us to cast a new tight upon the Vertebrates classification and their relationships. Thus, we will obtain a natural taxonomy of their different groups, in which Man undoubtedly is a masterly bit. It is, of course, not my purpose, in the restricted framework of this article, to submit a newly revised complete system to the reader. It would be a lot of work taking many years and the co-operation of many other researchers. Only the way to prosecute will here be indicated.

**Human condition or the problem about our origins.**

**T**he conception of a classic phylogenetical tree associating all Vertebrates in accordance with the Haeckelian model kept until today thanks to a regular immobility in science, but also through a certain hold on a very sensitive point of our scale of references from the part of the palaeontologists : I want to speak about the date on Man's origins.

**I**t has become a commonplace thinking that Man, in his "modern" version, as *Homo sapiens*, differentiated or specialised not long ago in the geological scale, from being a half-ape struggling through some generations with standing erect.

**T**he very anatomical and physiological impossibilities resulting from so wrong a model, were palliated on the one hand by the inspired idea of the Darwinists that Man would be the logical outcome of the evolution of the Vertebrates' line, and on the other hand by the skilful arrangement and fitting-up of the known Hominid fossils in the chronological and phylogenetical order *chosen by the same palaeontologists*...

**I**t is quite normal, in one sense, to discover in very old sedimentary layers the fossilised remains of Hominoids with *thicker skull bones*, or with a "heavy" skeletal structure, rather than to find the remains of individuals of *delicate* aspects, like the bones of *Homo sapiens*.

**I**nstead of actually retracing our lineage's history, the current palaeontologists confine themselves in gathering the osseous fragments of ancient apes or pongoid individuals, and eventually weave a web, between all these representations, of *non-existent* links of filiation or descent...

**I**n some other aspects, *Australopithecus afarensis* ( = "Lucy", in its 3 MY-old form ) looks just as a composite species which associates several closely allied or even non-connected forms, of similar *morphotypes*, yet far away in time from each other, more than one million years ! Each author, according to his own particular sensitiveness, makes the species *africanus habilis* or ( *Homo* ) *erectus* derive from his own selection of previous palaeontological patterns !

**I**n order to compare my individual conception of the Human evolution to the usual comprehension of a genealogical tree of Man's origins, I drew a scheme just as **fig. 1**. In this purpose, I was careful to trouble neither the chronological time-table, nor the regular position of the current fossils ( on the left ), but I actually put the Hominid remains on the track of *dehominization*, i.e. they are branching off in many ways from the central and chief trunk representing our immediate ascent ( on the right of **fig. 1** ).

**A**gainst the famous tale of "the hominization of the ape", as officially acknowledged by Darwin and the evolutionists, I set the biological reality of the evolutive phenomenon of *dehominization*, as evoked by KORTLANDT & KOOIJ ( 1963 ), then above all by HEUVELMANS ( 1974 ), in the midst of all Hominoid lineages. The phenomenon of *dehominization* exhibits a progressive leaving from the facial and bodily structures characterising the *Homo sapiens*. Its major starting-gear should have been a *specialization in feeding habits* along with a development of the teeth and the jaws which become mighty, a skull which becomes bigger and with a whole body slowly bending forward...

**T**he facts drawn from experience and the studies on early embryonic stages prove anyway the *dehominization* in a natural propensity to all the Hominoid lineages. From an anatomical point of view, our species *Homo sapiens* has remained essentially primitive in comparison to all the other Mammals.

**Brief outlines of the Theory of Initial Bipedalism**

**T**he particular root from which we once sprung and evolved must be of very old origin and so the common ancestor to all mammals was bound to have had *nearly* the same traits as we own, i.e. an erect body posture, our globular head, our plantigrade foot and so on...

**Fig. 1 Comparison of the Genealogical Trees of Man's Evolution** for the last 4 million year.

| | |
|---|---|
| Left : | the evolutive scenario as proposed by the palaeontologists. |
| Right : | the author's personal impression of a bushy tree whose trunk is constituted by the antecedent forms from which we assume the specific continuity ; the branches on this picture exhibit, in a graphic representation, as many dehominized outlines. |

**T**he very primitive and essential characteristics of the first Vertebrates is indeed that of a big *fundamental brain*. All those authors having written upon the subject ( WESTENHÖFER 1935, FRECHKOP 1941, SNOO 1942, HEUVELMANS 1954, SARRE 1988 ) have up to now insisted on this significant point... It is because we have been keeping our big brain that *we have remained bipeds !*

**T**here is a *voluminous* encephalon at the earliest embryonic stages in all quadrupeds, but its anatomical development is *carrying on* in the sense of a modification in bearing one's head, in connection with the phenomenon of the *dehominization* we were talking about earlier. So the globular brain precedes *any form* of skull or cranial structure...

**T**hus, all known morphological types in nowadays and ancient Vertebrates could be derived from the basic bipedal model with its globular brain. So we may obtain : *human beings*, hominoids, anthropoids, semi-erect bipeds with or without rest of their tail, flying or swimming forms and, at last, apodal ( "without legs" ) forms !

**F**irst, and totally according to the concerned diverging lines from a bipedal prototype, some *early* characters such as homoeothermy or placentary viviparity, subsist or fade away, until in a second time, still more profound characteristics are involved into the transformation of the whole shape ( for instance, through the loss of the original heterodonty...). In such a case, we should speak of a *reptilization*. The former mammal changes into a reptile !

**J**ust as several lineages chose that same evolutive option independently from one another we understand that it does not simplify the work of the classifier who is obliged to share in fractions, there where animals with a similar morphology ( *homology* ! ) but without any direct relationship to each other had been mixed together...

**T**he problem of a *new taxonomy* of the Vertebrates would then be to reorder the heterogeneous groups ( Reptiles, Amphibians and Fishes, especially ) composed of different animals whose only resemblance was their appearance !

**I**t was the same problem a few centuries ago, when whales were mixed up with fishes, or only a few decades ago, when zoologists spoke of "worms" ( *Vermes* ), whereas it is known now that all these groups are not related to one another, and thus are today displayed in several branches of the Animal Kingdom...

**The Marine Homonculus Hypothesis**

**I**ssue within the framework of the *Initial Bipedalism* Theory, the target of this thesis ( which is personal to the present writer ) is to give a rational and historical-evolutive explanation to the problem of the formation of a *big globular brain* in the first bipedal Mammals.

**A**s already exposed and related in detail ( SARRE 1988, 1989a and 1992a ), we should here be talking of an *ancient* apical organ that was conceived originally *as a spherical float* in a marine

full-water creature I called : *homonculus* at the archepagogic stage.

**I**n this concept, after the formation of the brain cavity and the start to function of the cerebral brain, in a function precedently assumed only by the *spinal chord*, the bipedal *homonculus* should not only have been Man's direct ancestor but also of all the other Mammals, of the Birds and of the different Reptiles, Batracians and the *Pisces*...

**W**hat may be called the exodus out of the water of the first Vertebrates endowed with a terrestrial vocation would then not have been the fact of a "classical" Crossopterygian fish whose fms changed into legs, but the work of the *bipedal amphibious homonculus*, whose organism just adapted to the possible transition from the marine sphere to a strictly *terrestrial* habitat ( SARRE 1989b, 1992b ).

**O**n the level of the *Classification* of the Vertebrates which is the subject of the present article, this *Marine Homonculus* hypothesis obliges us to entirely revise the common criteria nowadays in force... The fossil record will not give us- it should precisely have been its task - but some *indications* about some extinguished forms of remote faunas ! There will not be any need to reconstitute, going from a few shattered bone fragments, the phylogenetic tree of whole groups by arranging them into one row going from the oldest to the newest "more evolved"... It would better be emphasized on physiological accounts and on the basis of objective anatomical studies ( including embryological facts ) of the *natural* groups concerned !

**The example of the Dinosaurs and the Birds**

**T**he aim of the present article is not to establish a Zoology Treaty, but *to prepare it*... We should here only make some allusions to the Systematic of a few groups among the Vertebrates.

**T**he Dinosaurs, Birds and Crocodilians often have been gathered in the taxon of the Archosaurians ( GRASSE 1970 ). In this way, the Crocodilians were phylogenetically close to the Birds, and all of them would descend from some pre-Dinosaurian ancestors. The research of Max Perütz ( *Nature*, **291**, 1991 ) on the variants of sequences of aminoacids in haemoglobin would favour the attempt of a common line leading to both the Birds and the Crocodiles, in a separate way from the line evolution leading to the Mammals !

**T**his is a disguised allusion to the common fact that all these groups have "evolved *from* the Reptiles". This opinion surely could be reactualized through new biochemical discoveries. Yet, the station of a "reptile" appears to be absolutely essential, as far as the evolution of Mammals, Birds or Dinosaurs is concerned ! This way to proceed completely distorts the whole rapprochement to the problem... and its results !

**A**nd nevertheless, the more ancient dinosaurs are exhumed ( the newest one dug up, *Eoraptor*, is 225 MY old ), the more it seems certain they issued from small and swift bipeds, and not at all from big sluggish saurians !

**T**he fundamental difference between a bipedal *Humanoid* Mammal and a biped of an evolved *Dinosaurian* type lies above all in their dentition ( arrangement of the teeth ), in the development of

their mighty jaws and in the manners to supply themselves with food : the Dinosaurs, like Reptiles, *gobble up their food in one mouthful*... while the Mammals *masticate*. Therefore, the latter has *well differentiated teeth* and his jaws are moving laterally, like those of the ruminating cow...

**W**ithin the framework of our *Marine Homonculus Hypothesis*, the reconstitution of the evolutive history of the Dinosaurs can be made without any difficulty. In the beginning, they were little *bipeds*, equipped with long runner legs and a lengthy tail. The *food specialization* ( meat-eaters ) reshaped the head structure of the otherwise round skull, while the jaws grew mighty and became wellfurnished with sharp and cutting teeth. They *from then on* swallowed their preys and did not masticate anymore !

**I**n the beginning of their lineages the Dinosaurs still were *homoeotherm* ( warm-blooded ), viviparous and pilous. But they kept on *reptilizing*. Many later forms, like the big herbivorous saurians ( *Apatosaurus*, for instance ), used to run on all four and to lay eggs... So they have become quadrupeds, too, like the majority of the known Mammalian forms !

**B**irds, as such, have *all* remained bipeds... In order to explain their phylogenetic story, it is important to consider 2 things :

1. On the one hand, *Archaeopteryx*, a far cry from being a "primitive" bird, is in reality nothing but a aberrant representative of the *Aves* class being itself already deeply engaged in the process of reptilization ! *Archaeopteryx* was found in Jurassic sediments, but it could have lived among any other fauna of the Mesozoic, even in recent times !

2. On the other hand, the "classic" bird also represents a *very advanced* stage in the Avian series. Our birds today do not have much in common with the supposed aspect of the first *Aves* that once developed : just like a big lizard with a cat !

**A**s FRECHKOP ( 1939 ) noticed, Ratites ( ostriches ) are considered as "the most primitive" among the living birds because they do not fly and because their skulls look like those of Reptiles. Whereas the reduction of the wings and of their chest-bone, the terrestrial way of life, the nidifugous young, all these things *surely* represent a *more evolved state* among the Birds than those seen from other perspectives ! It is sufficient here to see the analogy with Mammal runners ( *Ungulidae*, for instance ), which have similar characteristics. Hence, they *never* have been considered as "primitive" Mammals...

**I** would even go further postulating that all known birds represent avian forms... which are *currently reptilizing* !

**L**ike the Dinosaurs, they have radically changed their feeding habits, *gulping down their food*, too. The initial dentition was replaced by a *beak* : i.e. a sort of horny holster also covering jaws and mandibles ! The character of homoeothermy was retained for reasons linked to the flight metabolism. The reproduction became henceforth assured through the egg laying, like for most of the Reptiles.

**A**t the beginning of the *Aves* class, there should have been *biped homonculian* forms with a round skull ( *primitive* big brain ! ) and *able to fly*. Maybe they were intelligent beings, or did they result from experimenting ? This is, scientifically spoken, the best way to explain all the particularities of the Birds, in comparison with other Vertebrates, where a *natural* evolution may also be presumed...

**I**n all possible cases, it is probably from this *very early* evolutive stage that comes the acquisition of the particular characters of the Birds, i.e. the transformation of the forelimbs into *wings*, that of the hind legs into "take-off" and "landing gear", the formation of the feathers and that of the *airbags* and airpipes in bones to lighten the whole body structure.

**W**hat we are calling "birds" are in reality only their *reptilized* descendants !

**An attempt to classify the Vertebrates**

**M**an is characterized by his anatomical *non-specialization* and structural primitiveness among all other Vertebrates ( the archaic hand *with 5 fingers*, for instance, just as the *big globular brain* ! ).

**A** far cry from being the rural result of evolution, Man, on the contrary, is what has closely remained of the *ancestral Vertebrates' prototype*... A fact which Embryology fervently confirms ! The diverse lineages of Vertebrate animals arise, as so many bifurcations do, from all sides of the central trunk symbolizing *Man's line of ascent* !

**W**ith the intention to illustrate such a conception of the evolutionary history of the Vertebrates, integrating the data given by the *Marine homonculus Hypothesis*, I will suggest a scheme like that in **fig. 2**.

**W**ith preference to the usual taxonomy, I will still presume the notion of the *Branch* of the *Chordata* : all those animals with a *spinal chord* ( see on the bottom of the picture ).

Fig. 2 **PHYLOGENETICAL SCALE OF THE EVOLUTION OF MAN AND OF THE OTHER VERTEBRATES**

**I**ndeed, the first ancestral members of this branch were *acephalous* ( headless ) creatures with a nervous system that only had its seat *within the spinal chord* ( = it was before the formation of the globular floating, nowadays our cerebral brain ). This taxonomic level includes not only the ancestral Precambrian forms and the Vertebrates but also those groups like, for instance, the *Tunicata*, the *Acrania* and other animals generally called invertebrates.

**O**n the next taxonomic level, that of the *Sub-Branch*, I would not yet put, as usually, the taxon of the Vertebrates, but the *Archencephala*, a term originally created in 1868 by the English naturalist R. Owen, who gave it the sense of *owners of superior brains* ( from Greek *arkhein*, "to command", "to lead", indicating a superior quality, and *kephalê*, "head" ).

**S**o did Owen put the accent onto a fundamental character of the Human species. As far as I am concerned, I would surely make use of this term *Archencephala* by letting the first radical derive from Greek *arkhaios*, "ancient", "old"... Into the *Archencephala* I class the marine *homonculus* in his *archepagogic* stage, whose spherical floater just developped before it started to function as our cerebral brain.

**T**he next evolutive step is that of the Vertebrates ( to whom I would attribute the taxonomic value of a *clade*, that is to say a *main stem* in the modern use of taxonomy ). It is connected with all the characters generally devolved to the Vertebrates, such as the presence of a *spine* with separate vertebrae, whose osseous prolongation in direction to the apical pole becomes the *skull* ( containing the original big brain ), whereas 4 limbs and their respective ( scapular or pelvic ) girdles slowly come into being on both sides ( SARRE 1992a ).

**T**his view of the evolution of the first Vertebrates clearly sees their emergence under the form of terrestrial *bipeds* with an erect body posture. So I would like to revive and raise the old taxon of the *Erecta* to the rank of a *Phylum*. It was first introduced in 1811 by the German zoologist Illinger with the intention to place the genus *Homo*. A Phylum is the natural group or the biological unity consisting of the original form ( here, the biped *Bauplan*...) and its derived forms.

**T**hen, I would like to include in this taxon *Erecta*, the genus *Homo* and his predecessor ( which looked very much like him, the *proto-Homo* as a generic designation ), all the *dehominized* forms ( like for instance the *Australopithecus*, in recent times ) as well as all the lineages resulting from this *dehominization* ; in a word, all Mammalian species and beyond them, all other Vertebrates in their classic forms...

**T**he problem remaining now ( and not only because of a graphic representation, as shown in **fig. 2** ! ), is that of a *grouping in Classes* ( Mammalia, Aves, Dinosaurs, Reptiloids, Amphibians, Ichtyoids...), then into zoological Orders and Genera. My diagram is only but reducing it to the basic forms in order to express what I wished to show !

## Conclusion

**T**he present article only wants to lay the foundation of a new understanding of the taxonomy in Vertebrates which ought to one time replace the precedent classification inherited from the Linnean static and descriptive model having been used in science since more than 2 centuries, a model that cannot be representative for nowadays purposes and which cannot retrace the natural phylogenetic history of the groups concerned.

**I** still hope that further subsequent dissertations about evolution and taxonomy will allow us to define

precisely this way of thinking and will complete the inherent data of the submitted model.

*Post-scriptum :*

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