The Littoral Theory of Hominisation
by
M. Bujatti-Narbeshuber

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Interpretation of data depends fundamentally on the theories available to us. At present this fact manifests itself especially disastrous in Anthropology. An extreme example is of course, that Sir Arthur Keith's theoretic conviction – that the evolution of brain seize, the very specific feature of man, had also to be first *(in the course of man's evolution)* led to his attempted proof by forgery ("Piltdown Man"), to be a little ahead of his research colleagues in what seemed theoretically certain to come anyway.

Precisely the contrary takes place, if, due to *(the conventional evolutionary scenario of the Savannah-)* theory, a real and available fossil is, so to speak reburied, because one does not (correctly) asses its *(phylogenetic)* position, one does not (adequately) evaluate it; thereby it will be kept out of the scientific discussion, by being ignored or by whatever other mechanisms.

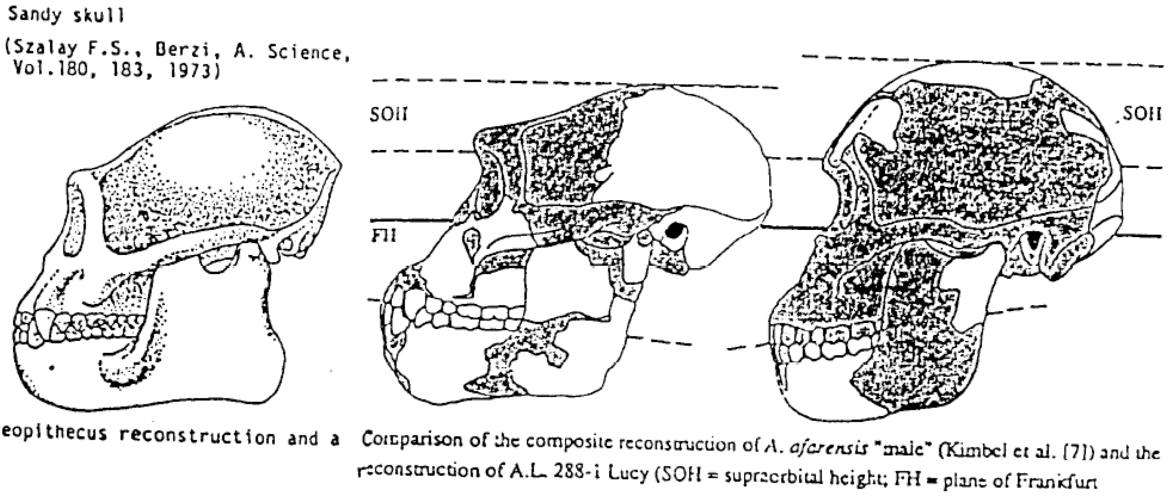
(Comment by the editor: This is what probably happened with the skulls of the Neanderthals of Gibraltar).

In my opinion this has also happened since 1962 with a primate named Oreopithecus bambolii Gervais (later re-described by J. Hürzeler). Oreopithecus, tellingly, has a small brain, but he has definitely a very modern dentition. (O. bambolii was first known from a lower jaw described by the French Palaeontologist P. Gervais). This jaw was at first taken to belong to the baboons. In 1952 though, J. Hürzeler, the Palaeontologist from Basel, found in the same place in the Toscana - about 8,5 million years old – a somewhat compressed but nearly complete skeleton of the same species, which he immediately recognised as belonging to the Hominoids. Hürzeler even took it to be a Hominid not a Pongid (Ape). In 1962, in the London Natural History Museum, the skeleton was exhibited and was thus called exceptional in this very respect *(See fig. 1)*.

But later on - in the larger part of the scientific community of palaeontologists - opinion grew - that this fossil represents an extinct - separate branch of the Primates – (*now even separately christened into*) the Oreopithecines – to indicate that this branch is scarcely related to Man, Gorilla and Chimpanzee. (Comment by the editor: O. bambolii, perhaps as big as the Bonobo, the pigmy chimpanzee, had in any case a brachiating morphology, which means he was a swing-climber with elongated arms that made him look more similar to the Pongides up to the Gibbons. See fig. 3).

If instead one performs an analysis of the metric form of the teeth in higher primates by Discriminate Analysis it turns out, that Oreopithecus (the *island swamp* littoral adapted primate labelled in 1 *in both diagrams of fig. 2*, *with statistical taxonomy by Bujatti-Narbeshuber M. and Timischl W.)* is the so far "missing link", always lying between the earlier, ancestral Cercopithecines (Old World Monkeys) and the later Australopithecines *(and the Human ancestors)*, that is both in the horizontal and in the vertical axis of the *two* diagrams.

Fig. 1



Sandy skull

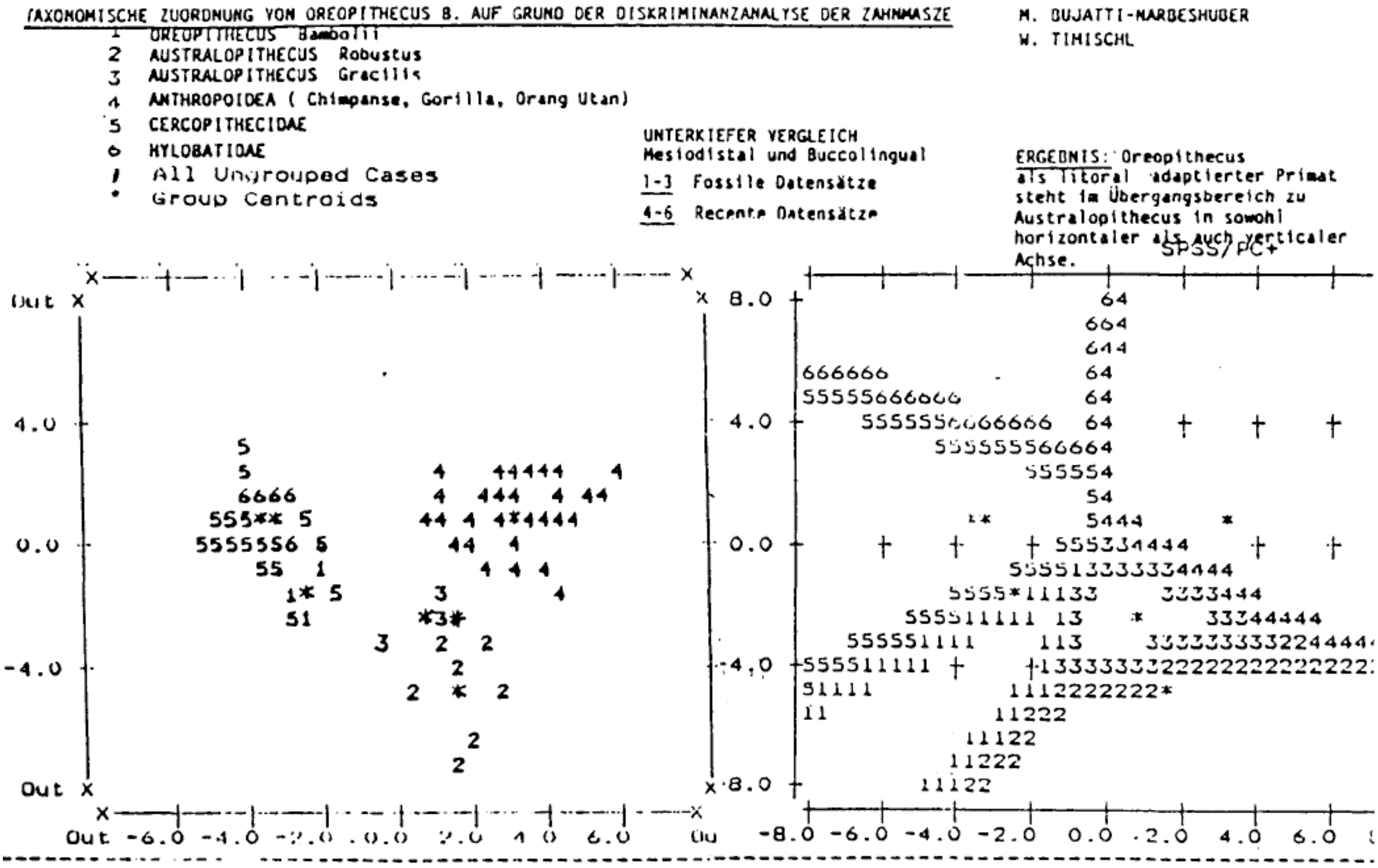
(Szalay F.S., Berzi, A. Science, Vol.180, 183, 1973)

Oreopithecus reconstruction and a Comparison of the composite reconstruction of A. *afarensis* "male" (Kimbel et al. [7]) and the reconstruction of A.L. 288-i Lucy (SOH = supraorbital height; FH = plane of Frankfurt

Taxonomic positioning of O. bambolii in relation to both A. afarensis "male" and female (Lucy) based on comparative anatomy of the whole sculls.

Sandy scull.
Szalay F.S., Berzi A. (Science, Vol.180, 183, 1973) Oreopithecus reconstruction and a comparison of the composite reconstruction of A. afarensis "male" (Kimbel et. al.) and the reconstruction of A.L. 288-I (Lucy).

Fig. 2



Littoral theory of Hominisation: Transition of Primates to Man

Taxonomic positioning of Oreopithecus b. based on the statistical taxonomy by Discriminate Analysis of teeth measurements by M. Bujatti-Narbeshuber and W. Timischl.
Comparative buccolingual and mesiodistal teeth metric taxonomy of fossil (1-3) and recent (4-6) data from the lower jaw:

Homo a Littoral Primate and Niche Changer: Littoral Double Niche Transitions-theory, LDNT

Hominid evolution has to be seen in the littoral double niche, according to a Transition theory *(LDNT)* with three phases and three stages:

1. The Miocene Oreopithecus "dental phase (1)" with the reduction of canine eye teeth and a littoral adapted lifestyle.
2. The Messinian-pliocene "postural phase (2)" with land-water bipedalism and then water-land retro-transition leads up to Australopithecus.
3. The Pleistocene "cortical phase (3)" with the passage from Australopithecus to Homo habilis at the start that leads to the "double culture" of Homo through the initiatory, sound-symbol conditioned release of the diving response transition.

Most significant in this evolutionary scenario is the continuity of the Littoral as a conservative double niche- and transition- space which leads as (*dual, compensating, continuously oscillating teleonomic transition space between land and water, playing and diving, creativity and intelligence behaviour selection*) a railway track through strong ecological changes due to climate changes. In more detail this evolutionary scenario was as follows:

I. Coastal woods (*on African fauna land bridge to Sicily, Sardinia and Tuscany islands*) of land trees together with swampy ground: brachiating *(facultative bipedal during littoral feeding of dental phase)* together with quadruped locomotion (Miocene, e.g. Oreopithecus-stage I).

II. Then follows next the littoral land and shallow to deep water stage with *(postural phase, obligatory)* bipedal locomotion and swimming, diving that, during the Messinian, an epoch with total aridification of the Mediterranean, is continued e.g. in the coastal region of the Red Sea on Danakil-island (*volcanic* Afar triangle). Then follows next the river and lake littoral of the East African great rift valley (Pliocene, e.g. Australopithecus-stage II).

III. Only now evolutionary scenario of the Savannah theory. Transition to the life in the steppe *(as the now ritually diving, littoral migrating, both gathering and hunting primate of cortical phase*) with the evolutionary selection of Homo (Pleistocene, e.g. Homo stage III.

LDNT of the diving response, speech and brain size evolution

Of utmost importance in this stage *(of the transition to a life in the steppe)* was the maintenance and further evolution of the diving response as the invariance mechanism of brain expansion and symbolic speech.

The diving response is released upon contact with water on the face, by trigeminal and glossopharingeal nerve receptors; but it can also be released by telereceptors *(e.g. via sound signals)* from cortex centers – through symbol-conditioning. *(e.g. by initially four respiratory logic diving-cycle-phonemes HA-G-N-IM (light, fire) of the speech code defining culture and unfolding its semantics, syntactics, pragmatics, informatics by innovative play behaviour).*

First of all, when released out of water, or when under water, via the respiratory centre of the brainstem, the diving reflex naturally stops all respiratory activity *(the physiological signal of the teleonomic transcending period in meditation research).*

Secondly during the diving reflex a centralised circulation to the heart and the brain develops so that the brain now gets most of the blood and the circulation to the periphery is somewhat reduced by the brainstem vaso-motor centre: since the supply of oxygen is totally cut off under water, any surplus in the oxygen reserves is shunted towards the brain *(that is most sensitive to hypoxia)* and away from the periphery.

In this I see a connection with the evolutionary tendency towards brain enlargement. An important feature is the relationship between bodyweight and the size of the brain, which has been known for a long time. It is essentially a performance-relationship illustrating how effective the metabolic capacity is in supplying the needs *(oxygen, glucose, lipids, etc)* of the brain-size. Este Armstrong has made this clear by multiplying the bodyweight by the basal metabolic rate to give the metabolic capacity and demonstrated a linear relationship between it and the size of the brain. This means that our brain is exactly as large as our metabolic capacity allows. I call this the “brain limit hypothesis”.

If these values for different mammal species *(species specific differences exist in regard to the proportion of energy directed to the brain)* are plotted into a diagram, the primates make an exception and among them - even more so - the humans. But differing from other aquatic mammals, characteristically also provided with a larger brain, like the Pinnipedia and the Odontoceta, that could afford to increase their metabolic rate to supply more energy for their larger brains, the primates including humans do not increase their metabolic rate. How do they manage to nourish their bigger brains? Their share of the brain taken from the total metabolic capacity of the body was increased out of proportion during phylogeny. Starting from a share of 5% in most mammals, the Primates among them doubled their share to 10% and among them Homo alone again doubled his share to now 20%.

If we now take a look at these relationships from an ontogenetical perspective we see *(the reverse trend in ontogeny, namely)* that the newborn brain– constituting 10% of the bodyweight – uses 80% of the metabolic capacity of the body; in a four years old child the brain uses 40% and 20% in the adult.

This *(rapidly decreasing ratio in ontogeny and the reverse trend in phylogeny)* fits into the picture of a partial neoteny in Human evolution, causally brought about by the littoral diving adaptation *(where also the metabolic energy is shunted away from the rest of the body towards the brain as in the newborn).*

This corresponds also to some morphological neotenic features demonstrated amongst others by Schindewolf and by K. Lorenz concerning neotenic human ethology. So these changes lie in the same direction as the adaptive orientation of the diving response - to which we can add something interesting: the diving reflex has (relaxing) priority over all other instinct programs, something which I find is the very characteristic for the phenomenon, that we call “human freedom”.

LDNT of Meditation, Sleep, Culture and Civilisation

A prominent trait of Diving Physiology is the activation of brain performance while at the same time the activity of the periphery is lowered (otherwise you would go to sleep) and this is also the characteristic feature of the special physiology during Meditation.

During the aerobic diving physiology of natural, transcendental Meditation we see a shift from a dominance of catecholamines (the norm) to their decline and an increase in indolamines. This 5-hydroxy-indol building by hydroxylation, as the Serotonin *(“Rest and Fulfilment” Neurotransmitter and Hormone)* metabolism, is increased with thus a compensating homeostatic result.

“Normally” there exists this imbalance – due to an inborn systemic bias that rigidly takes into account an activated and intact diving physiology – but in case of its loss a more or less intense situation of stress results, so typical for our culture.

Today this situation leads in many ways to widespread expensive disturbances which are treated by literally megatons of psychoactive substances so far bringing about only pseudo-compensation *(Somato-spiritual, Psycho-sexual, Socio-intellectual, Ecologic-financial (SPSE) Systemic Overload Syndrome (SOS) treated by behavioural means(Bujatti-Isodynamic ®) but also alcohol, nicotine, non-addicting drugs, addicting drugs, pain-medicines, psycho-pharmaceutical products, etc.).*

Obviously man was provided from his littoral phylogenetic adaptation with the faculty for dynamically maintaining the balance in his brainstem neurotransmitter system. He there established with nature a service contract for the *(new, rapidly evolving littoral)* brain: from now on the processing in the rapidly growing memory storage is not any longer done sufficiently through the sleep mechanism. Its activity (Reliability Constraint Elimination) is transferred to an innovative, symbol initiated dive-behaviour mechanism, as the “Cultural *(-Constraint) Integration* Mechanism“; a formal residue of which is still found in Christening and other baptism rituals and in Meditation Techniques. Its nearly complete absence, definitely not only in our western Civilisation, is probably linked up with what Hans Selye has developed as the concept of Stress and probably also with Sigmund Freud´s “Civilisation and its` Discontents” (Das Unbehagen in der Kultur).

To conclude the above area of problems with some considerations about their phylogenetic perspective, Konrad Lorenz is quoted here:

” Surprisingly, the older generation of ethologists and psychologists has not realised how necessary it is to find an explanation for the most improbable fact, that the learning processes always lead to an improvement of the Teleonomic Effect. Telling exceptions can be found, as examples for mistake-learning, in the psychopathology of phobias ….. “, here understood as the loss of a species-specific inborn behaviour.

“Each living creature is a system historically developed and each of its´ phenomena can only be understood if rational-causal research traces back the route of phylogenetic emergence to its roots.”

This “Special Transition-Theory” of human creativity and of the epigenetic emergence of speech *(from Littoral Double-Niche Transitions)* is an integral part of the “General Transition-Theory“ of Evolution. It was conceived to answer questions raised by Monod in 1970 in his book “Chance and Necessity” by the genetic-epigenetic “Unified Theory of Life”.

COMMENT OF THE EDITOR:

It is our pleasure to provide for Mister M. Bujatti-Narbeshuber the possibility to publish here his trans-disciplinary thoughts which he read on 26th of October 1991 to the 2 nd Symposium for Neurobiology, in Salzburg. But we want to alert the reader to the fact that this is a most hypothetical system of thought that in some parts deviates strongly from todays accepted theories. But it throws light into an area of human origins where still a lot of questions are open, especially concerning the evolution of Hominids (Australopithecus, Homo) from Miocene Hominoid primates. Into this timeframe and spectrum of candidates also belong Proconsul, Ramapithecus, Kenyapithecus and possibly even Oreopithecus also – or a still unknown one.

Certainly, geographic isolates do play an important role in the genesis of new evolutionary lines and island-forms are truly interesting therefore. An “Aquatic Hypothesis” has already been developed, especially concerned with the uniqueness of the hominid skin (1, 2). Here new arguments are given for it.

That tooth relations of Oreopithecus would fit rather well, could naturally be based on convergent evolution. Similar is the situation in the Ramapithecus-Discussion that is still not closed. We can only hope that new finds will give use more clues.

Fig. 3

Aus: Y. Coppens, *Die Wurzeln des Menschen*

Editors addition to the article, The Oreopithecus bambolii total body reconstruction.
From: Y. Coppens, The roots of Man

LITERATURE:

1. Hardy, A., Was man more aquatic in the past, New Scientist. 4/1960;
2. Westenhöfer, M., Der Eigenweg des Menschen, Berlin, 1942.