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UNDERSTANDING RECENT APES AS PARALLEL MODELS IN PALEOANTHROPOLOGY. AN EPISTEMOLOGICAL APPROACH

ABSTRACT: The use of models gained in research concerning primate behaviour or human sociobiology is common in the creation of environmental concepts in paleoanthropology. This usage, however, produces the risk of anthropomorphic interpretation of ecological and sociobiological situations regarding the human ancestry. To reject those models is often not possible. One has to ensure that these models are indicated and their metaphorical nature is respected. This does not mean that paleoanthropology is not an exact science, as theory is underdetermined in every science as well as, for example, in physics.

KEY WORDS: Paleoanthropology – Scientific methods – Behavioural models – Epistemology

INTRODUCTION

In the second half of the 19th century Friedrich Nietzsche (1973) stated that truth is an army of flexible metaphors and anthropomorphisms. Thus he made the important point that truth is both relative to a theoretical system applied as well as to extrinsic factors such as e. g. history and language. In the 20th century a rich tradition of epistemological approaches evolved discussing the movements of the metaphors called "truth". It is easy to comprehend that a science as paleoanthropology is highly depending on theoretical constructs and coherent concepts. This is due to the fact that the empirical basis is sparse and consists mainly of the fossil record which can only give an extremely limited impression of the *lebenswelt* of ancient times.

The conceptual importance of primatology in research concerning human evolution

Some of the questions and concepts created to shed light on the origin of *Homo* and his latest achievements are build on results gained in primatology. Primates, as Foley (1987)

put it, are giving the context to the research on human evolution. Especially in behavioural ecology they seem to be used as a direct metaphor for human behaviour. *Figure 1* gives an interesting example for anthropomorphism in primatology, showing apes as comic-characters ascribing a clearly human chain of thought to a gorilla. Figures of this kind are included in a number of publications regarding social and intelligent behaviour in apes or sociobiology (e.g. Byrne 1995, Sommer 1992). The critical attitude towards the visualisation of logical thinking in apes should not be misinterpreted as a negative attitude against the logical and perceptual abilities which are surely present in apes. But the illustration shows how an attempt to transport a certain idea, which is at first glance very reasonable, can easily end up in an anthropomorphism which cannot be verified by scientific method. An obvious problem is that Byrne (1995) suggests that these cartoons might give an idea on intentional aspects of ape behaviour, which clearly does not seem to be possible. Since intention has to be regarded as one of the "hard nuts" even in philosophy of human consciousness.

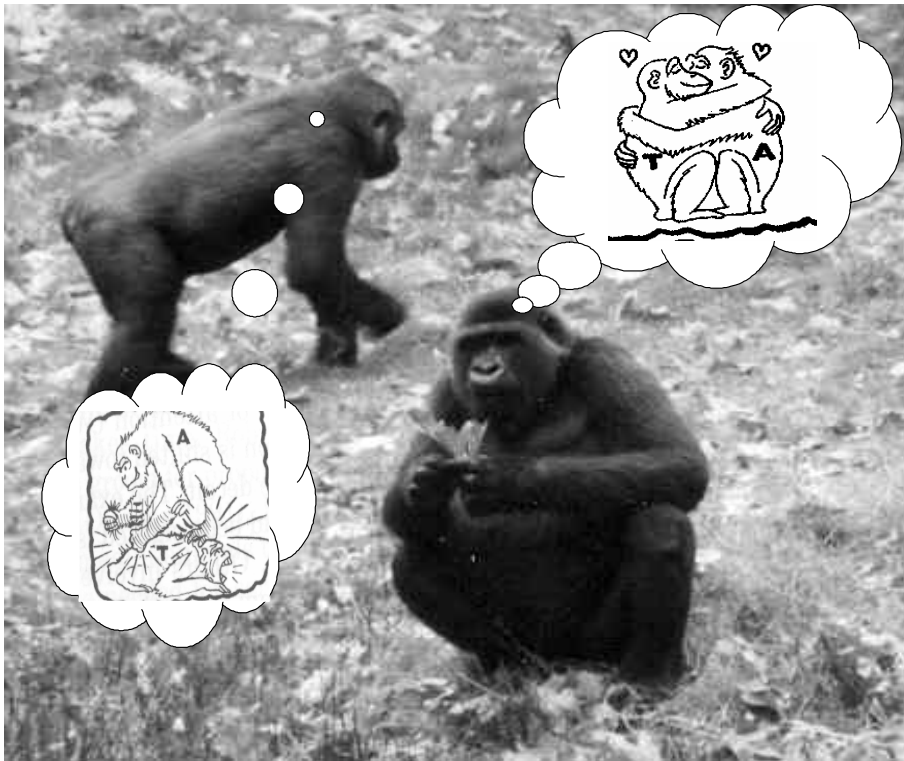


FIGURE 1. Apes as comic characters? A common way to visualize social behaviour and problem-solving strategies in apes.

Sommer (1996) asks whether the observation of monkeys and apes might directly teach us lessons about human social systems. Without exception one is allowed to clearer conclusions on all natural aspects from this parallelism, Sommer holds, only excluding ethical issues. From an epistemological point of view the range of information gained on the basis of this parallelism is quite surprising. One always has to bear in mind that the role of monkeys and apes as a parallel model is due only to their evolutionary kinship with humans, viz. the fact of a common ancestor. Many factors influencing the behaviour such as habitat, group size, group organisation etc. differ clearly.

There surely is a possibility or even a need to use the empirical results of primatology in human behavioural ecology. But the questions must be carefully formulated and the concepts and theoretical background must be well defined and explicitly mentioned (Quiatt, Reynolds 1993). The power of the described parallelism has to be weighed against the scientific slack of using a method of conjecture.

But as a matter of fact progress in paleoanthropology can only be achieved by interpreting the data available, even if that means making up a story of humanisation. The history of *Homo*, which is mostly a biological history, cannot be told without assumptions. It would be most astonishing if results in evolutionary biology could be presented without recurrence on an ecological background; as well as it would be surprising if an ecological analysis in zoology could be done without the examination of the behaviour of the taxa in question.

We have however to come clear with our terms. What makes the difference between a vague conjecture and a

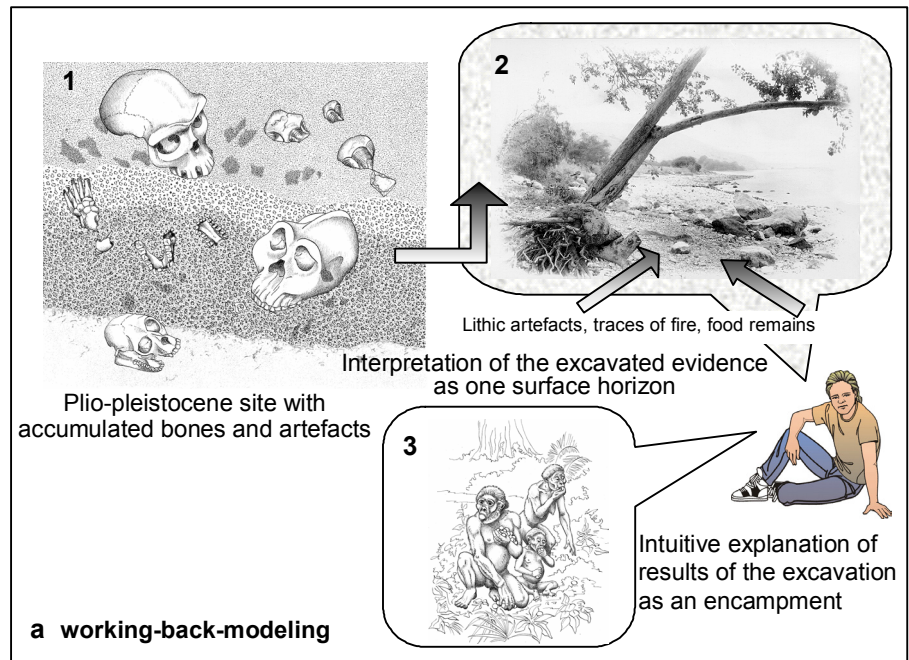
scientific assumption? Is paleoanthropology a lesser natural science compared to physics, chemistry, molecular biology and other experimental disciplines? To answer these questions, a close look at contemporary philosophy might help, to get a clearer idea of the progress of science.

Underdetermination of scientific theory

The thesis of the underdetermination of scientific theory is one of three major theses to be found in the thinking of Williard Van Orman Quine, who starting as logician became an eminent figure in the language philosophy and epistemology in the second half of the 20th century. Quine (1990) himself sees the thesis concerning empirically equivalent theories as a recurring theme of his philosophy. The main point of Quine's thesis is that natural science is empirically underdetermined due to the fact that scientists have to invent hypotheses in order to be able to explain some phenomena or to predict certain events (Quine 1975). Explanation and prediction are both crucial aspects of modern science situated beyond the observational basis of science.

Quine (1992) holds that it is possible to form two theories which are empirically equivalent, but logically incompatible. Schematically one has to imagine a set of possible observations E , which can be used as the basis of two sets of theoretical formulations T_1 and T_2 . Both, T_1 and T_2 , are perfectly concise interpretations of E , but are incommensurable. This may even lead to the situation meaning that T_1 contains the sentence a , while $\neg a$ (the negations of sentence a) is member of set T_2 . If we choose one set of theoretical formulations as state of the art, we do so arbitrarily (Quine 1992). The classical example for

FIGURE 2. Analysing sites on the basis of an interpretation, thus going beyond empirical data (Henke, Rothe 1999).



incommensurability is the interpretation of light as wave or as corpuscle (Quine 1975).

One might argue that one of the crucial premises of the argument is wrong and hold that theories are in no sense of the word interpretations, but are a direct outflow of observations and are just true in an absolute sense of the word. In philosophy, however, this is not a very popular idea throughout the 20th century. It was shown that already in the 19th century Nietzsche formulated his doubts concerning the concept of "truth", but ever since philosophers have argued for a differentiated attitude towards "truth" especially in science. Brochhausen and Brochhausen (2001) have demonstrated that relativistic arguments can lead to a clearer understanding of the terms and results in anthropological research.

It is important not to misinterpret Quine's position as anti-realistic. Nature is in Quine's (1992) view not just a convention but does really exist. But as a matter of fact the human community is not able to know how nature works. This leads practically to a form of conventionalism, but does not imply ontologically that there is nothing to be right or wrong about (Quine 1992). So one has to be very carefully using the notion of ontology regarding Quine's work (Quine 1969). Quine however seems to hold that there is a world of external things. So his main interest is what we can say and what we do know about these things. Concerning the practical work of research, however, we have to face the fact that there are more than one defensible ways to conceive the world (Quine 1992).

Narrative structures in science and a necessary metaphor

In scientific practice Quine's thesis of the underdetermination of theory has to lead to a new modesty as it is obvious that concerning every matter of interest there might be a second

theory to the one used, being quite as plausible. The choice of the theory, which dominates research, is arbitrary. In Quine's point of view this fact means a big chance for the scientific enterprise:

"Suppose again two rival systems of the world, equally sustained by all experiences, equally simple, and irreconcilable by reconstrual of predicates. Suppose further that we can appreciate their empirical equivalence. Must we still embrace one theory and oppose the other, in an irreducible existentialist act of irrational commitment? It seems an odd place for irrational commitment, and I think we can do better. (...) Where there is forever no basis for choosing, then, we may simply rest with both systems and discourse freely in both, using distinctive signs to indicate which game we are playing" (Quine 1975).

The world, to put it in the words of Goodman (1978), is full of versions of itself. One has to bear in mind that Goodman's versions concern the cultural phenomenon of describing the world. Nevertheless the possibilities of invention have to be more limited in science.

This does also apply to a science as paleoanthropology, which needs a lot of conjectures in order to build a helpful version of human phylogeny. *Figure 2* shows that innovative trends in the research of early human ecology and human behavioural ecology can only be achieved by using monkey and ape societies as parallel models. This use has to be accompanied by naming the premises used and describing the theoretical background. Even the results interpreted as common ground to paleoanthropologists have to be considered.

CONCLUSION

The structure of paleoanthropology demands the use of parallel models from primatology. This fact does not imply a secondary character of paleoanthropology in comparison to other natural sciences. Following Quine's thesis of empirically equivalent systems of the world every science has to cope with the underdetermination by empirical data. But as an anthropomorphic travesty has to be avoided, it is important to give clear definitions of the questions and to name all the premises and paradigms used in giving the answers. Otherwise the results would end up as merely mystical versions of human ancestry even regardless the usage of the vocabulary of modern biology.

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