Gigi Tevzadze

EVOLUTION
OF SOCIAL BEHAVIOR TO HOMO AND AFTER

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Evolution of Social Behaviour to Homo and After
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Editors: **Giga Zedania, Zaal Kikvidze**

Design and layout: **Ketevan Gogava**

Cover design: **Giga Kekelia**

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Despite the high academic level and intellectual capabilities of advisors and assistants, the reader will undoubtedly find in this book inaccuracies and incomplete reasoning. These are by no means the fault of those of my colleagues who carefully read the text. It is simply that I did not feel it essential to take certain comments and wishes into account, given the internal logic and architecture of this book.

Zaal Kikvidze

FOREWORD

Let me present this new book, Gigi Tevzadze's 'Evolution of Social Behaviour to Homo and After', a very interesting and highly daring (in the best sense of the word) new synthetic theory about human origins. This topic is interesting in itself, to the extent that we humans are interested in our own origins. This topic becomes even more interesting and provocative on account of those difficulties that accompany it. These difficulties, first and foremost, arise from the paucity of objectively and physically confirmed facts which, for its part, gives rise to a multiplicity of subjective facts (by subjective facts I mean all the more or less well known theories or hypotheses about human origins, from creationism to published versions of man's phylogenetic tree). These difficulties demand extended and intensive research (so much is needed to get to know a whole multiplicity of facts alone, both objective and subjective, not to mention their analysis, comparison and characterization). However, Gigi Tevzadze has approached this task in a novel way, and his work is considerably more than a modified theory based on the latest, newly discovered fossils. This new theory expresses especially elegantly how, after a certain stage, social behaviour becomes the moving force behind man's evolutionary development.

It is apparent from this work that Gigi Tevzadze has analysed not only the facts, but also those methods and ap-

proaches that have been used up to now. Unlike his precursors, Gigi Tevzadze makes use of various research techniques, among which methods devised for the analysis of scant factual material are especially noteworthy. The main thing is that Gigi Tevzadze has undertaken interdisciplinary research. Such research is not easy: a large amount of additional factual and theoretical material from various disciplines must be analysed and compared breaking through the communication barriers between these disciplines; at the same time, a very sensitive balance must be maintained when combining the knowledge from various disciplines into new theoretical constructs. However, an array of methods and an interdisciplinary approach gave the author the power to sort an enormous number of facts and to organise them into a fascinating system. This is Gigi Tevzadze's most important achievement: synthesizing a new theory, which outlines the basic contours of man's origins. To put it figuratively, Gigi Tevzadze has constructed a building which allows seeing its entire interior from any of its window (disciplines); before our eyes unfolds the landscape of man's evolution with its basic milestones. Just as thermodynamics determines the limits for any specific physical or chemical process, Gigi Tevzadze's milestones frame the major transitions of human social evolution.

Much more could be said in praise of the author. For example, that in analytic parts Gigi Tevzadze relies on logic devoid of any emotion, always impregnable where facts permit,

and maximally rational when he is limited to assumptions. This is complemented by synthetic parts which expose fully the author's originality and creative talent: a firework of astute intuition in finding unexpected links between seemingly unrelated topics by changing the angle of enquiry. This is how Gigi Tevzadze enthrals the reader and takes his captive's breath till the end of reading.

Each and every chapter demonstrates innovations put forward by Gigi Tevzadze. And, of course, he very frequently provokes a desire to argue, especially in such an impatient reader as me. At the first glance it seems to me that the knowledge from my area of expertise is not thoroughly presented but selected in a biased manner, and that my field – ecology / biology– is not enriched by new facts. For example, from palaeontological facts almost the unique example cited is Toumai. But the magical instant comes when I consider the final product of the research and thought – a new theory about the role of social behaviour in man's origins – and the desire to argue abates. What I want to say here is that criticizing interdisciplinary research becomes very – overly – easy if we limit our discussion by any isolated discipline. It was like this when Darwin was studying orchids and their pollination (an intersection of zoology and botany). As we know, he predicted the existence of a moth with a proboscis of a particular length and structure, which would pollinate a tropical orchid with a single nectary hidden at a record

depth in the flower. It is true, this book was well received, but his prediction nevertheless was criticised: it was hard to believe that such a special moth existed. But this moth really was discovered by zoologists who understood Darwin's idea in its entirety and did not grab hold of entomological dogmas of the time. My second example is from chemistry. The table of chemical elements just was not complete until Mendeleev assumed the existence of previously unknown elements with certain chemical properties (eight in total, including germanium, gallium and scandium). This put the whole system in order (an intersection of mathematics, physics and chemistry) and the discovery of the predicted elements very soon began. Gigi Tevzadze's system, taken in its entirety, solves numerous tricky and disputed issues in man's origins: the origins of bipedalism, hair loss and subcutaneous fat accumulation, the importance of a shore habitat for primates' social life, the growth in society and the reduction in aggression, shamans and chiefs, the role of women and reproduction, sex and homosexuality, pre-sapiens social predominance over Neanderthals, the role of innovations and the third layer of 'intellectuals', domestication and totems, art, the origins of mutual love, and the birth of narrative. The birth of Christianity and the history of its spread are used as an illustrative example of social evolution. If we were to take all these issues in isolation, forgive my repeating, issues out of context become so easy to criticize. This criticism never

will be constructive and, if there is something to criticize in this book, its entire context must be considered.

Of course this book has things to be criticized and improved. I don't imply softening politically tricky issues, such as women's emancipation and homosexuality. This is scientific theory and the author must write what he considers closest to logic and the truth. However, here and there I felt that the author excessively sharply turns off or leaps over and shortens the description of ideas and developments simple for him, but difficult for many other readers to comprehend. For example, it is almost an axiom in population genetics that the more numerous a population, the greater the speed of its evolutionary and adaptive processes, if there is corresponding pressure from natural selection. For non-experts this is not so clear, and for this reason it would perhaps be better for there to be more explanation of this issue, especially when comparing the societies of the Neanderthals and of *Homo sapiens*. It would similarly be useful to show that among many birds and animals, including primates, song as a pre-mating ritual is very widespread and diverse, which makes easier the assumption that it was song that was one of the most important components in the social behaviour of our ancestors living on the shore. Wishes can still be expressed, but it comes to mind that Gigi Tevzadze's work is interdisciplinary. I am convinced that sociologists, anthropologists, historians, palaeontologists, physiologists, geneticists, ethologists and others will have similar

remarks. If the author were to take all of this into account, the fine balance between the size of the text and its content would be upset! To remain constructive, I propose to the author that at crucial points understandable, often-cited knowledge be provided in appendices for those interested in a particular issue. Finally, let us recall that there were six editions of Darwin's 'On the Origin of Species', and in each new edition the author attempted to take into account criticism which, to an extent, softened the radicalism of Darwin's theory. However, it is noteworthy that contemporary biologists when citing Darwin's book quote the first and most radical edition.

By way of a conclusion I would like to analyse what Givi Tevzadze's new work predicts. First and foremost, palaeontological material must be sought that reconstructs the history of primates living on the shore. The fragment of Toumai's skull is clearly very little. Much depends on how palaeontological methods will develop and, sooner or later, material must be uncovered confirming the existence of a whole population of Toumai-like primates. But here a further thing should be borne in mind: man's evolution was rapid not only because his hypothetical ancestors lived in large populations. Rapid evolution also requires increased pressure from the environment, which will speed up the selection of dominant genes, and of forms of behaviour. This means that our ancestors did not live in a stable environment and their population, however large in numbers, didn't extend widely. It is entirely possible that this

was the unique population that often had to adapt to a new environment, before *Homo erectus*. This species had already accumulated so much advantages (controlling fire, producing tools) that it began to spread widely. For this reason, it would be no easy matter to find the fossilized remains of a shore-dwelling population, but the presumed characteristics of this ancestor from Gigi Tevzadze's work can help guide future palaeontological research.

One way or another, it can be boldly said that we are potentially dealing with a very serious breakthrough on the scientific frontier. I used the word 'potentially' because now it is simply not possible to say any more – proper evaluation of a work of this scale historically will require a lengthy period of time. Intuition tells me that future palaeontological reconstructions will confirm Givi Tevzadze's new theory, or will apply corrections to it in the same way as the discovery of genes modernized Darwin's theory of the origins of species without negating it. Similarly, new palaeontological discoveries usually produce new versions of theory on the origins of humans, yet Darwin's original idea that man and today's apes had a common ancestor clearly remains valid. But isn't Gigi Tevzadze's work interdisciplinary? It starts from the natural sciences and extends widely into the social sciences including analysis and synthesis of religions and their history. Here I recall Teilhard de Chardin's 'The Phenomenon of Man', a book after reading which you are

convinced that there is no real antagonism between scientific knowledge and religious beliefs. In any case, I am convinced that extremely interesting and moving discoveries await the next generation of researchers if they follow the directions prompted by Gigi Tevzadze's book.

Giga Zedania

BEYOND THE TWO CULTURES. FOREWORD

That an introduction presents a philosophical problem we know, at the very least, after the publication of Hegel's 'The Phenomenology of Spirit'.* When in the foreword to this book Hegel says almost directly that we should not perceive the foreword as serious,** he is juxtaposing the concrete self-realization of the philosophical text with the abstract generality of its introduction. But in this case at least the author of both the text and of the introduction is empirically the same. The matter is twice as difficult when these two figures differ from each other, not only in the level of the discourse, but also empirically. For this reason I cannot aspire to grasp the full diversity of Gigi Tevzadze's book, for which I would need a much better knowledge of biology, anthropology, and history than I can claim. However, I shall attempt to discuss from one specific position those changes that this book presents doubly: as a symptom and as a force. This position is called epistemology.

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* Hegel, G. W. F. *Phänomenologie des Geistes.* Meiner Verlag, Hamburg 1988, 3-4.

** Hyppolite, J. "Stucture du langage philosophique d'après la préface de la "Phenomenologie de l'Esprit". In: *Figures de la pensée philosophique,* Vol. 1, PUF, Paris 1991, 340-352.

It may be said half-humorously that intellectual paradigms in philosophy replace one other every forty years, in any case, at least from the end of the nineteenth century. From the 1880s the heralds of a new paradigm are Nietzsche and Dilthey, in the 1920s Heidegger and Scheler, and in the 1960s Foucault, Derrida and Habermas. The rhythm is so striking that it is possible to build the next concept of cyclical development according to these replacements, and then to start thinking: don't cyclical theories cyclically return to a certain period (Spengler's main book was published in 1918, and Sorokin's in 1957). However, firstly, it is the issue of the cyclicality of nature and the teleologicality of culture that is put under question in the paradigm introduced by the present book; secondly, our present time casts doubt on this concept: some forty years have passed since the last – structuralist or post-structuralist – revolution, but a new paradigm is nowhere to be seen. Authors who are today in fashion, Badiou, Agamben and others, are in truth continuers of the 'paradigm' of the 1960s and not augurs of something new and 'as yet unheard of'.

This, as has already been said, is half-humorous. But if we look at it seriously, we will in the same way feel a certain erosion of a theoretical concept, The fact is that nowhere are new schools of thought, new movements, new directions visible, with which the last century was so rich.

But what does the word 'visible' mean? That they don't exist, or that we don't notice them? Couldn't this be the result of our lack of curiosity? It is not for no reason that we began

counting 'paradigms' from Dilthey. To Dilthey belongs a clear division between natural sciences and human sciences, and a dualism underlies this division according to which there exist two forms of being: man and the rest of the world. It is not difficult to detect here the Cartesian division between *res cogitans* and *res extensa*, which in the end, after a quite a large alteration, will take on the form of the demarcation by Heidegger between *Dasein* and other kinds of beings.* Practically, Dilthey, Heidegger and the hermeneutics that appeared as a consequence of their thinking are what to some extent suppressed an alternative paradigm of philosophical anthropology, one which was very much closer to the idea of a discussion of natural and human as a whole (Plessner, Gelen). And it is just such a division that causes our clear-sightedness: the fact of the matter is that the signs of a new 'paradigm' really can be seen on the horizon, but it is these very signs that dismantle the difference between these two groups of disciplines.

This is really an expected historical outcome. We come from an era for which this difference was so important that C. P. Snow called it a difference between two cultures.** Clashes between these two cultures were not unheard of, to the extent that the very thought of erasing this difference is very difficult

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* Marion, J.-L. "L'ego et le Dasein Heidegger et la" destruction "de Descartes dans *Sein und Zeit*". In: *Revue de Metaphysique et de Morale*, 92 (1), 1987, 25-53.

** Snow, C. P. *The Two Cultures*. Cambridge University Press, London 1959.

to imagine. But it is just this which is happening today. Systems theory for example, distinguishes three types of system: (a) living systems, (b) mental systems, and (c) social systems. All three of these are described using the same terminology. That which a century ago would have been a naive demonstration of positivism is today a model of the refinement of a theoretical concept.*

Or else let us take another example: Jacques Derrida's strategy of describing any structure fundamental for life as autoimmunization, or in other words, the reaction of the organism's immune system to its own tissue and cells. The latter term is taken from immunology, but surely its spread to the whole diversity of human life (including 'spiritual' life) is not a dreadful biologist's reductionism? It is certainly not.**

It is in the context of this paradigm change that we should read and understand Gigi Tevzadze's present book. In truth, what the author is doing here is discussing man as a natural being, and culture itself as the description of a natural phenomenon. This is in no way reductionism that exerts a rough 'naturalization' of cultural phenomena. No doubts at all are raised over the special role of human life or existence. However, from the perspective of this approach the opposition between culture and nature seems entirely obsolete.*** One feels the need for new

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* Luhmann, N. *Einführung in die Systemtheorie*. Carl Auer Verlag, Heidelberg 2004.

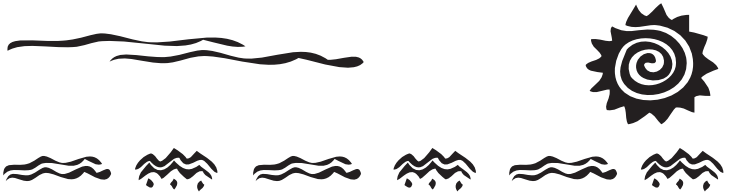
** Derrida, J. *Voyous*. Editions Galilée. Paris 2003.

*** Cf. Schaeffer, J.-M. *La fin de l'exception humaine*, Gallimard, Paris 2007.

terminology and a new language. The idea of universal evolution, which using the triad of selection, variation and retention, describes not only the sphere of nature but also of society (in the latter, the institution and not the genome is discussed as the unit of analysis), and gives this approach a solid foundation.

But unlike earlier, pre-modern approaches, this new, nascent paradigm is no longer in a hurry to encompass the whole and the totality. Isomorphism between nature and fragments of culture – this is the greatest ambition that it has for the time being.

My proposal is that we read the present book, not only as a symptom of this new paradigm, but also as a force directed towards its hegemonization. Time will pass and, it this book proves successful, the empirical material cited in it will become obsolete, and the theoretical paradigm will become so clear that it will be difficult to think otherwise. And then there will be returns to it – to discover new, unexpected, forgotten intuitions hidden or taking shelter. In any case, it seems like this from our paradigm – doesn't the difference between the two cultures lie in our not returning to the texts of natural science, but constantly reading the foundational books in humanities from the beginning, despite their contents being known to all. Foretelling whether or not time will erase this difference would be as thankless a matter as divining what will happen to a figure traced on the sand in an era of global warming.



INTRODUCTION

Even though no doubts arise over the origins of man (*Homo sapiens sapiens*) in the animal kingdom, the mechanism and process of this origin are as yet unexplained. Even though man's link to the animal kingdom is genuine – we can observe so many genetic, physiological and behavioural correspondences – it is still not understood how the human community, which differs so much even from species that are very close to it on the evolutionary ladder, actually originated. All the more so if we take into account that there is less than a three per cent difference between the DNA of certain human-like ape species (chimpanzees, bonobos) and our own.[1] The question I attempt to answer in this book is this: **How is *Homo sapiens* possible?**

1 Chimpanzee Sequencing & Analysis Consortium, "Initial Sequence of the Chimpanzee Genome and Comparison with the Human Genome," *Nature* 437 (2005): 69-87.

Our acceptance of the idea of evolutionary link between us and animals is based on intuition. Without reference to any theory of evolution we 'know' that we can understand animals' emotions and that we can convey ours to them. This is a result of that universal observation that their emotions are similar to our emotions. Whatever we might speak and write about anthropomorphism, or in other words, about our understanding as humans of non-existent 'human' emotions and behaviours into the behaviour of animals, we can easily observe how animals relate to one another and not only 'read' the content of some specific behaviour, but also assume the reaction to this on the part of other animals. We easily comprehend the behaviour of the majority of (higher) animals: we know when they are angry and when they are in a good mood. We can easily relate to them after acquiring a modicum of experience. Similarly, animals easily understand our emotions and the expressions of these emotions. If we experience difficulties in understanding animals' gestures and self-expressions this is because the expressions of some of them closely resemble our own. For this reason it is possible for us to perceive any type of primate smile as indicating a good mood, but among primates a certain kind of smile indicates threat and aggression.[2] On the other hand, it is by no means ruled out that if we undertake an analysis of the smiles characteristic of humans that we would

2 Robert Plutchik, *Emotion, a Psychoevolutionary Synthesis* (New York: Harper & Row, 1980).

reach the same basis: for example, a child's smile may not at all indicate a good mood, but rather depict subordination.[3]

However, in spite of so many similarities and so much mutual empathy, it still remains an enigma why human society is so different from that of animals. The answer of modern science is that this difference is the result of evolution, or in other words, that our behaviour developed very slowly over tens and hundreds of millennia and took on its final form as we know and see it today. Such an answer – based on evolution – suits us in correctly accounting for differences in the social structures of various animal species. However, this answer remains a general one and it does not explain the sequence and chain of those developments that resulted in the origin of those very specific sociums that characterize humans and which differ sharply from the animal kingdom. These sociums have, in principle, retained the same structure now for several millennia. Any change in human society is more connected with the internal distribution of power within society and with an increase or decline in security, while the fundamental structure and constituent elements of society, on both the personal and community levels, remain the same. In spite of attempts by European thinkers of modernity to reconstruct primitive man as a being possessing, in principle, a differing

3 Paul Ekman, ed., *Emotion in the Human Face* (Cambridge University Press, 1982).

mentality, these attempts have remained in the realm of wishful thinking and fantasy.[4]

The difficulty we encounter when comparing human and animal societies and behaviours is that we simply coincide with each other in very many actions and structures: like animals, we also have a strong emotional relationship to beings like us, we form families, we are concerned with posterity, we protect our territory, we obtain food, we fight foreigners to defend ourselves and those like us, we also fight people like us, we sacrifice ourselves for others, we play career games, we can sacrifice others for our goals, we invent and use tools and weapons both to obtain food and to fight, we can accept and give refuge to a stranger, but we can also eject one of our own and doom them to die, and so on.

Of course, man's 'part' in these actions is often much more complex than its analogue in the animal kingdom, although either can easily be referenced to the other.

By way of example, humans falling in love with each other, expressing interest, and social modes of success or lack of success are much more complex than, if you like, for wolves or elephants. All the same, the 'complexity added' to this process by humans – such as the use of various technological means

4 F. M. Barnard, ed., *J. G. Herder On Social and Political Culture (Cambridge Studies in the History and Theory of Politics)* (1969; repr., Cambridge University Press, 2010). Also Jean-Jacques Rousseau's romantic attitude towards "children of nature": "*Emile, or On Education.*"

to express their own feelings – changes nothing in its social scheme: the emotional yearning of two individuals for each other, as a result of which the creation of an emotional relationship follows, and often that of a social link as well.

On the other hand, the basis of this complexity, which can appear to us as trivial when directly comparing these behaviours, is a difference in principle between us and animals, between the principles of the arrangement of our and animals' sociums. It is these differences in principle that win the name 'humanity' for human behaviour, and leave as 'animal' the behaviour of animals.

There are only a few significant behavioural structures or forms that are an inseparable part of our being as humans and that, at the same time, sharply differentiate us from animal societies. These are religion, art and science. In this book I shall attempt to show that the three of these behavioural systems, or else what forms the foundation of these behavioural systems, are not so much human creations as, in a certain sense, they participated in the creation of man. Accordingly, in a certain embryonic form, they characterized what was still that being, that form of hominid, who was man's direct ancestor.

In this book I wish to describe the hypothetical path that man's ancestor had to travel before acquiring his final form as man, or in other words, that path that could take us from the behaviour of a highly developed animal to human behaviour. In the same way, if this is possible, I shall establish that

chain of contingencies (geographical or social occurrences) that could have brought about these changes and results.

To this end I make use of and compare pre-existing data in palaeontology, palaeoarchaeology, zoology, ethology, medicine, psychology, anthropology and sociology. Besides this, I think that taking into account the behavioural structures of highly organized and highly intellectual animals could give us interesting results for the genesis of man's social behaviour. Modern man (*Homo sapiens sapiens*) neither appeared suddenly nor was he unique: modern paleontological data tell us that over several million years several variants of Homo existed: 'hobbits' (*Homo floresiensis*), Neanderthals (*Homo sapiens neanderthalensis*), Denisovans (*Denisova hominins*), *Homo erectus, Homo habilis* and probably others.[5] It is possible for us to suppose that these hominids' behavioural structures somewhat resembled the behavioural structures of those highly developed animals that we can observe today in the wild. We have further grounds for this hypothesis in that the social behaviours of modern highly developed animals more or less resemble one other, accordingly, hominids' behavioural structures must either have been similar to those of more highly developed animals (for example, chimpanzees or orangutans) or of *Homo sapiens sapiens*, or in other words, similar to the

5 C. Groves, *Order Primates in Mammal Species of the World*, ed. D. E. Wilson and D. M. Reeder (Baltimore: Johns Hopkins University Press, 2005), 181-84.

social behaviour of modern man, or they must have displayed features of both. This hypothesis will assist us in establishing an idea of why *Homo sapiens sapiens* proved to be the most successful among other (already extinct) hominids and, in the same way, it is to be hoped that we will also understand what underlies the rapid technological development of *Homo sapiens sapiens*, which did not occur in the case of other hominids, the Neanderthals, for example. Although the Neanderthals had refined work tools and art,[6] even though they exceeded *Homo sapiens sapiens* physically and in brain volume,[7] their socium existed unchanged over almost 500,000 years, while the socium of *Homo sapiens sapiens* underwent significant changes over a period of only some 40,000 to 45,000 years and established itself as a modern type of society.[8]

6 Alok Jha, (science correspondent) "Neanderthals May Have Been First Human Species to Create Cave Paintings," http://www.guardian.co.uk/science/2012/jun/14/neanderthals-first-create-cave-paintings. H. Bocherens et al., "Isotopic Evidence for Diet and Subsistence Pattern of the Saint-Césaire I Neanderthal: review and use of a multi-source mixing model," *Hum. Evol.*, July 2005, 71-87, doi:10.1016/j.jhevol.2005.03.003. PMID 15869783. Pallab Ghosh, "Neanderthals Cooked and Ate Vegetables," *BBC News*, December 27, 2010.

7 F. Mallegni, M. Piperno, and A. Segre, "Human Remains of Homo Sapiens Neanderthalensis from the Pleistocene Deposit of Sants Croce Cave, Bisceglie (apulia), Italy," *American Journal of Physical Anthropology* 72, no. 4 (1987): 421-29.

8 J. L. Bischoff and et al, "The Sima de los Huesos Hominids Date to Beyond U/Th Equilibrium (>350 kyr) and Perhaps to 400–500 kyr:New Radiometric Dates," *J. Archaeol. Sci.* 30, no. 30 (2003): 275. H.M. McHenry, "Human Evolution," in *Evolution: The First Four Billion*

I think that human behaviour must have been decisive here. Owing to various natural or social conditions the behaviour of man in his final form (who possibly existed directly before the origin of *Homo sapiens sapiens*) was probably the tool that in the end brought man all that predominance, and by means of which (1) he attained inconceivable biological success relative to other mammals, other primates and other hominids, and (2) he began rapid technological development.

Although two species of primate, specifically the bonobo and chimpanzee, are the closest to Homo on the evolutionary ladder,[9] it is doubtful whether a study of their behavioural and social structures would tell us anything about Homo's specific and differing behaviours. It is possible that it might even be the other way round: the behaviour of the bonobo and the chimpanzee might indicate to us how Homo's behaviour was *not*. To the extent that these species inhabited the selfsame large geographical environment, their behaviour and social structure must have differed. Just as we cannot discuss the behaviour of a tiger or of a cheetah based on that of a leopard, in the same way, the behaviour of the bonobo and of the chimpanzee cannot come in useful as positive indicators in the reconstruction of Homo's behaviour, although they could fulfil the function of a

Years, ed. Michael Ruse and Joseph Travis (Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 2009), 265.

9 Ann Gibbons, "Bonobos Join Chimps as Closest Human Relatives," http://news.sciencemag.org/sciencenow/2012/06/bonobogenome-sequenced.html. June 13, 2012.

negative indicator. Or in other words, we can assume that some behaviours and social structures characteristic of chimpanzees and bonobos were not characteristic of Homos, and the converse. Bonobo society, which is characterized as managed by females through sex,[10] and chimpanzee society,[11] which is described as ultra-aggressive and is managed by males (including infanticide), can work as negative indicators in a hypothetical description of Homo's society. We may hypothesize that Homo society was neither exclusively female (managed through sex) nor male (managed through aggression), nor burdened by the phenomenon of infanticide. All the same, it is clear that there exists a similarity between human behaviours and those of chimpanzees and bonobos, however we must consider these behaviours more as general indicators of an extended family (in the same way as in the case of leopards, tigers and lions) than as particular social characteristics of a species.

In the same way, it is natural that I make use of those data that I have obtained as a result of empirical observation over more than forty years of living among humans.

One important conclusion that follows from this book is that the origins of human behaviour were governed by chance

10 F. White, "Comparative socio-ecology of Pan paniscus," in *Great Ape Societies*, ed. WC McGrew, LF Marchant, and T Nishida (Cambridge, England: Cambridge Univ. Pr., 1996), 29-41.

11 Frans B. M. de Waal, "Bonobo Sex and Society," http:// www.primates.com/bonobos/bonobosexsoc.html. F. de Waal, *"apes in the Family". Our Inner Ape* (New York: Riverhead Books, 2006).

in the extreme, and were the result of unique coincidences of numerous natural or social facts. By these 'contingencies' I do not mean only bipedalism, or in other words, walking on two legs, but such things without which today we could not imagine our existence, and which we consider immutable, essential and 'given' elements of our being.

For example, attending sporting events, discotheques, technological innovations, organizing demonstrations over political or social demands, the significant percentage of homosexuals in any society, and others: all of which we cannot see and which, it is to be assumed, does not exist in the animal kingdom.

The second and no less significant conclusion from this book, which I similarly hope the reader will share, is that human evolution more than anything else is the evolution of social behaviour. I do not know to what extent it is possible to extend this principle, even partially, to the origin of species, but I think that I have sufficient arguments to demonstrate the correctness of this proposition in the case of the origin of man, *Homo sapiens sapiens*.