THE SOCIAL EVOLUTION OF HUMAN NATURE

This book sheds new light on the question of how the human mind evolved. Harry Smit argues that current studies of this problem misguidedly try to solve it by using variants of the Cartesian conception of the mind, and shows that combining the Aristotelian conception with Darwin's theory provides us with far more interesting answers. He discusses the core problem of how we can understand language evolution in terms of inclusive fitness theory, and investigates how scientific and conceptual insights can be integrated into one explanatory framework, which he contrasts with the alternative Cartesian-derived framework. He then explores the differences between these explanatory frameworks with reference to cooperation and conflict at different levels of biological organization, the evolution of communicative behaviour, the human mind, language and moral behaviour. His book will interest advanced students and scholars in a range of subjects including philosophy, biology and psychology.

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From biology to language

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For Judith, Friso and Simon

. . . it is a heuristic maxim that the truth lies not in one of the two disputed views but in some third possibility which has not yet been thought of, which we can only discover by rejecting something assumed as obvious by both the disputants . . .

F. P. Ramsey, *Foundations: essays in philosophy, logic, mathematics and economics*, edited by D. H. Mellor. London: Routledge & Kegan Paul, 1978, 20–21.

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Preface and acknowledgments

This book combines scientific and conceptual insights. There is a simple reason: its author believes that both are indispensable for understanding human nature. I make here some autobiographical remarks in order to clarify how I arrived at this position.

I am trained as a biologist and was and still am interested in zoology and genetics. The biological approach to the behaviour of animals including humans had my interest, and at the University of Groningen I studied foraging behaviour of birds (starlings), social behaviour of monkeys (hamadryas baboons) and the principles of evolutionary genetics. Like many others, I was impressed by Hamilton's contribution to our understanding of the evolutionary genetics of social behaviour. But I found it hard to apply Hamilton's insights to human social behaviour because it was unclear to me how genetics can explain unique features of the human species like self-consciousness and language. I thought at that time that, in order to understand the origin of human nature, we first have to understand the evolution of these unique features of the human mind. But I had no idea of how to investigate these features and only noted that the mind/body problem somehow obstructed the application of biological principles to humans. The longer I thought about these problems and the more I read, the more confused I got. I decided to take some courses in philosophy in order to understand problems better. The result was that I became a philosopher as well, understood some problems better, but still did not understand much of the evolution of human nature.

After I graduated I had the opportunity to do a project on evolutionary epistemology at the University of Nijmegen. I studied evolutionary theory, possible applications to the evolution of cognition (and theories) and some parts of Kant's philosophy, because Konrad Lorenz made in his *Behind the mirror* a link between Kant's philosophy and evolutionary epistemology. It was in this period, presumably spring 1984, that a colleague invited me to join him to attend a lecture of the philosopher Peter Hacker, because he

knew that I had an interest in the philosophy of mind. I remember clearly that Hacker explained, convincingly to me, why some cognitive psychologists and neuroscientists have it wrong when they argue that there are symbolic representations somewhere and somehow encoded in brain processes. I also remember that my colleague thought otherwise and raised his hand to make some objections. But there was something else that caught my attention, namely that Hacker made a simple observation: we can use a ripe tomato (as a sample) for explaining the word 'red', but there is no such thing as explaining a mental predicate (e.g. 'pain') through pointing at a sample in the brain or mind. Why was I then struck by this simple truism? With the benefit of hindsight, I can see two reasons.

First, because I assumed at that time that the idea of the logical empiricists that words are connected to reality through ostensive definitions was mistaken. Yet Hacker argued that ostensive definitions are useful for explaining the meaning of some words (although there are others ways of explaining word meaning) and that many philosophers misunderstood their role. There was a link here with evolutionary epistemology, for it was assumed in this field that we have innate knowledge of concepts enabling us to understand the use of words. Kant's philosophy was thought to be of potential interest, for Kant argued that the mind imposes regularities upon the external world (through concepts guiding our experiences). Extending Kant's ideas, Lorenz suggested that (innate) concepts of our mind are adapted to the environment, just as the eye is adapted to the rays of the sun. Whereas Hacker's ideas raised the problem of how we can understand the evolution of the use of words as an extension of the use of gestures such as pointing, Lorenz's ideas raised the problem of whether our knowledge of concepts evolved as the result of mutations affecting brain processes. I realized then that one cannot have it both ways.

The second reason was because Hacker emphasized that there is no such thing as explaining a psychological predicate (e.g. 'pain') through pointing at a mental sample (in the immaterial mind). He argued that the assumption that the physical and mental domains are comparable to each other is misguided. The mental domain is, in contrast to the physical domain, not populated with immaterial objects, events, states or processes which can be observed through introspection (enabling us to report what we discover in the mind). This observation raised the question of how children learn the use of psychological predicates if it does not rest on introspection. Children learn their use when they learn to extend and replace natural expressions of psychological phenomena (also displayed by our closest relatives) with linguistic ones (e.g. 'Au!', 'It hurts', 'I have a pain' instead of crying or

screaming out of pain) *and* when they comprehend that these linguistic expressions uttered by others are manifestations of these phenomena (enabling them to say: 'He has a pain'). Linguistic expressions of psychological phenomena do not rest on introspection, while attributing psychological predicates to others rests on what they say and do. Again, I realized that Hacker's ideas had implications for how we should investigate the evolution of the way we communicate about mental phenomena.

I have to add that I was at that time only dimly aware that the arguments Hacker advanced had an enormous impact on how we should conceive of human nature. But I did realize that Hacker discussed an alternative view that could be far more interesting than the theories I had been studying. I went to the library the next day and obtained a copy of Hacker's *Insight and illusion*, which is about Kant's, Frege's, Russell's and Wittgenstein's early and late philosophy. After I finished reading (convincing me that there was an alternative view), I decided to visit Hacker in Oxford in order to discuss some problems. I can hardly recall what we discussed then, but remember one analogy that Hacker used for explaining why the rules for the use of words are autonomous. I found it so extremely illuminating that, after I returned home, I spent about two days explaining the analogy (and its implications) to my girlfriend (although she understood the essential point probably within a few minutes). Hacker remarked that the rules of tennis *would* be different if we had invented the game while living on the moon, but the rules of tennis (we have invented on earth) are not accounted for by referring to the laws of gravitation, for we *could* have invented different rules.

After finishing the project in 1985 and later my PhD in 1989 (which was about the nature/nurture problem in immunology, developmental biology and psychology), I decided to return to biology. I had read Leo Buss' *The evolution of individuality* and, because of my background in immunology and developmental biology, decided to learn more about evolutionary transitions, i.e. the transition from unicellular creatures to the symbiotic unicell, and from the symbiotic unicell to multicellular organisms. This was at the time an interesting research topic because there was for the first time conclusive evidence that mitochondria and chloroplasts (living inside host cells) were originally free-living bacteria and later became endosymbionts. Molecular biology was providing us with data enabling us to get definite answers to old questions. It was also clear that these data about subcellular structures and molecules were going to transform our ideas about the origin and evolution of the early forms of life. Buss' book was interesting because he noted that there was at the subcellular level far

more potential for conflict than was realized by biologists at that time. Moreover, he argued that cooperation between cell organelles and host cells, and between cells in a multicellular organism, require explanations.

While studying cooperation and conflict at a subcellular level in 1991, one particular example caught my attention. My girlfriend, then a gynaecologist in training, told me that the rate of spontaneous abortions was much higher than expected (closer to 30% than to 5%). And she added that the embryo produced the hormone hCG (human Chorionic Gonadotropin; associated with pregnancy sickness) affecting female physiology: it suppresses the shedding of the uterine lining (endometrium) and hence prevents menstruation. When I read some papers I realized that the production of hCG by the embryo raised interesting evolutionary questions, for it showed that embryos determine in part their own chances of survival. But why do embryos determine their own fate? Why do they manipulate maternal physiology? These were new questions to me, because I had thought about maternal–foetal interactions in the context of immunology. Because the embryo is genetically not identical to the mother, immunologists studied the mechanisms that prevent an immune response of the mother (presupposing cooperation between mother and child). However, I was also familiar with the work of Robert Trivers on parent–offspring conflict, and I realized that there could be a conflict involved between parent and offspring about starting and continuing a pregnancy. I had also read some papers about the phenomenon of genomic imprinting (the phenomenon that the expression of alleles in an organism depends on the sex of the parent) and decided to discuss problems with Rolf Hoekstra, then a population geneticist at Wageningen University, because Hoekstra had studied conflicts between mitochondria and host cells and how they were resolved. He told me that the Australian biologist David Haig had already explored these problems. When I later read Haig's (now well-known) paper on 'Genetic conflicts in human pregnancy' (1993), doubts about the basic soundness of these ideas disappeared. About ten years later I visited Haig and discussed possible effects of intragenomic conflicts on brain and behavioural development. I am indebted to Haig for sharing his ideas on intragenomic conflicts. The discussions helped me to think more clearly about how imprinted genes affect the transfer of resources from parents to children.

Imprinted genes have key roles during prenatal development in resource transfer from mother to child. They are also expressed in the brains of children and then affect the postnatal transfer of resources from parent to offspring. They are also involved in the development of communicative

behaviours, including linguistic behaviour. This latter observation raised the possibility that, if we will learn more about the effects of imprinted genes on brain development, then we will understand the social evolution of the human mind better. It requires no stretch of the imagination to understand why this possibility created excitement among investigators. There was another reason: studies by Keverne *et al.* (1996; see also Allen *et al.*, 1995) showed that paternally and maternally derived genes have different effects on the relative growth of brain structures. Paternally expressed genes contribute mainly to the development of the hypothalamus, while maternally expressed genes contribute to the development of the neocortex. Does this mean that genes that come from the father promote impulsive, instinctive behaviour, whereas genes that come from the mother promote more conscious, reasoned behaviour? Are these different effects also the reason why there are intrapersonal conflicts in the mind? Elucidating the effects of imprinted genes on brain development, many reasoned, will provide us for the first time with information on how and why genes affect – what Freud and James called – conflicts in the mind. For me there was another reason for excitement: I could use the alternative insights of Hacker and others to study the possible effects of imprinted genes on the development of the human mind. This possibility was the reason for a second wave of trips to Oxford, and I started to think about how we can integrate modern evolutionary theory and the philosophy of mind advocated by Hacker and others.

In this book I summarize the main results of my investigations into the social evolution of human nature. It describes how human nature evolved. It is up to readers to evaluate the way I have integrated modern evolutionary biology (i.e. inclusive fitness theory) and an alternative conception of human nature. I really enjoyed rethinking some problems in evolutionary biology and adjoining fields (medicine, psychology, anthropology) and coming up with new ways of studying them. It is easy to summarize the major shift advanced in this book: it is more interesting to study problems with the Aristotelian framework extended with Hamilton's theory than with the Cartesian framework extended with Hamilton's theory. The reasons why are explained in this book.

The thoughts in this book developed slowly. When I started the project of writing this book, I thought that it would take one or two years to finish it. It took me about five years, because solutions did not come to me as quickly as I hoped. But I enjoyed tackling the problems and it was worth the effort, for every step I took during this project was an improvement and helped me to see the social evolution of human nature better. I can

only hope that readers will enjoy the picture sketched in this book and that it will help them to solve and resolve problems they encounter. I immediately add that this picture is based on the insights of others, especially on the ideas expressed by the persons mentioned in this preface. I want to thank them for sharing their ideas with me. I am especially indebted to Peter Hacker. I have benefited over a period of thirty years from his writings, comments and from our discussions.

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