

Sozialwissenschaftliche Schriften

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Heft 25

# Homo Biologicus

An Evolutionary Model  
for the Human Sciences

By

Charles Elworthy



Duncker & Humblot · Berlin

**CHARLES ELWORTHY · Homo Biologicus**

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*To my family*



## Preface

The following work provides a framework through which human characteristics can be understood, and human behaviour modelled. Its principal impetus arose from the dilemma in which I found myself, having accepted a maximising model of man as a result of reading economics in England, and a maximising model of state behaviour through studying international relations in the United States. I became convinced that there was no trivial solution to the incompatibility between egoistic individuals and unitary states, and that a realistic study of human behaviour required a foundation in the natural sciences, specifically evolutionary theory. This belief was reinforced through my experience of the recent upheavals in central Europe, where the inadequacies of conventional models in the social sciences became very apparent.

The book is a revised and extended version of my doctoral dissertation for the Otto Suhr Institute of the Free University of Berlin. The general literature review extends until works appearing before mid 1991, with a more limited examination of more recent publications. The principal arguments and general structure are outlined in the introductory chapter; suffice to note here that it draws on theoretical and empirical work by a large number of authors from a variety of fields. The aim is to present certain arguments and provide references to related literature, rather than to test new hypotheses or to report empirical research.

Associated with this objective is the extensive use of footnotes and the frequency of quotations. The current fashion in English-language academic publishing is away from such scholarly apparatus, and towards an apparently less intimidating format. There are good reasons for considering such a traditional style more rather than less 'reader-friendly', however, once the reader is accustomed to the appearance. The placement of footnotes at the bottom of the page allows a reader-directed level of inquiry: with a practised eye those who are not interested in the notes can pass them by, those who wish to read them have only to look at the bottom of the page rather than in endnotes or a bibliography, and those who are not sure can quickly scan them. Notes allow a more sophisticated handling of references than the author (date) system, where qualifications, amplifications, and other remarks must occur in the main text. Given a choice between footnotes and endnotes, it seems more logical to ease the reader's access to them, rather than enforcing a 'finger at the back' form of readership.

Similar arguments apply to quotations, especially for a work which so relies on other writers' arguments and research. Firstly, it is simply more intellectually honest. Secondly, the original authors are specialists in their own fields, and can be expected to have crafted their statements so as to accurately convey their ideas, while an unskilled



reconstruction can easily omit or misrepresent important but subtle points. Finally, the discussion often refers to specific arguments by particular authors. Within the "invisible college" associated with a particular subject a simple citation may be appropriate, because all know the original text, but the scope of this work is such that I cannot presume that readers will be familiar with all of the literature cited, and I expect that most would require more than their standard institute or departmental library should they wish to trace the original quotations.

The book is intended to be read from beginning to end, as each chapter is based upon its predecessor, and even apparently standard themes are often handled in an unorthodox fashion. For those who wish to refer to a particular author or subject, appropriate indexes are to be found before the bibliography. The glossary contains a list of the principal technical terms as an aid to non-specialist readers.

With respect to conventions, double quotation marks have generally been used when referring to the word or expression as such, or when the text has been defined by somebody else. Single quotation marks have normally been reserved for occasions when I have wished to apply an expression in a non-standard sense, or to use an informal word or phrase. Personal pronouns have been avoided as far as possible, but standard usage has been followed in the use of "he" with the implicit meaning of "he and [or] she" when necessary. The style generally follows that recommended in the *Chicago Manual of Style* and by Turabian,<sup>1</sup> except for the usage of square brackets [...] for first editions, and the delimitation of the details and page numbers of reprints with parantheses {...}.

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<sup>1</sup> University of Chicago Press, *The Chicago Manual of Style* [1906] 13th ed. rev. and expanded (Chicago: University of Chicago Press, 1982); Kate L. Turabian, *A Manual for Writers of Term Papers, Theses, and Dissertations* [1937] 5th ed. rev. and expanded by Bonnie Birtwistle Honigsblum (Chicago: University of Chicago Press, 1987).

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One of the cultural differences between continental Europe and the English-speaking world is that academic titles are part of the legal name in the former, but are often omitted in the latter, and I apologise if I use an incorrect form in acknowledging my thanks. Many benefactors assisted my research by offering advice, providing publications, and giving permission for the reproduction of illustrations, and I express my gratitude to: Professor Richard Alexander, Professor Robert Axelrod, Professor David Buss, Professor Robert Carneiro, Professor Leda Cosmides, Professor Martin Daly, Dr. Richard Dawkins, Professor Riley Dunlap, Dr. Margaret Gruter, J.S.M., participants in the Human Behaviour and Evolution conferences, Dr. Deborah Larson, Mr Hamish McHardy, Professor Anne McGuire, Ms. Frances Michelmores, Mrs Alexandra Milgram, Dr. Geoffrey Miller, Professor Dr. K.-D. Opp, Dr. Roger Pearson, Professor Leopold Pospíšil, Professor John Tooby, Professor Nancy Thornhill, Professor Randy Thornhill, Dr. Robert Rosen, Professor James Rosenau, Professor J. Phillippe Rushton, Professor Bruce Russett, Professor Dr. Reinhard Selten, Professor Robert Shiller, Dr. Pouwel Slurink, Dr. Chris Stringer, Professor Margo Wilson, and Professor David Sloan Wilson. A number of arguments have been refined through discussions with students in my evolution seminars, and I thank them for their openness and enthusiasm.

For helping to prepare the manuscript for publication I would like to express my appreciation to Professor Dr. Peter Häberle, Frau Stefanie Lorenzen, Ms. Hannah Pearce, Shgal Bay Press, Dr. John Small, Mr. Timothy Smith, Frau Monika Wohnsiedler, and two anonymous referees. I am grateful to Mr. Michael Robilliard who extracted the essentials from my cluttered sketches, and drew the figures 3.1-3.5 and 5.1.

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## I. Introduction

Homo biologicus is a model of human characteristics that is proposed as an interface between the natural and the social sciences. I hope that it will serve as a type of market, and allow the linking of what I perceive to be unmatched supply and demand. In evolutionary theory and evolutionary psychology there exists a powerful methodology for explaining human characteristics, but there is a need for sophisticated predictive models of behaviour. In the social sciences there is an enormous supply of both techniques for analysing behaviour, and data describing it, but a requirement for satisfactory specifications of individual characteristics.

Homo biologicus provides a method of uniting these two theoretical worlds, in that its specification is a product of the evolutionary sciences, whereas its application is in the social sciences. The expression "Homo biologicus", with its allusions to species and to biology on the one side, and to "Homo oeconomicus" and "Homo sociologicus" on the other, is intended to emphasise this connection. A further aspect of this role as an interface is that of an *evolutionary* model for the human sciences, as the model itself is capable of evolving in response to both its natural science and its social science environments.

Rather than adopting an inductive methodology — observing human behaviour and working backwards to a model of man — the approach is instead deductive, interpreting the behaviour of humans within the same analytical framework as that used for other species. The development of the argument can be viewed as an example of "hierarchical reductionism", a mode of analysis discussed in the first section of Chapter II, where the higher and more specific levels are explained in terms of the lower and more general ones. The study of human characteristics and behaviour — the human sciences — is thus seen as a particular application of generally valid findings from the natural sciences. The book itself is structured in the inverse order of this hierarchy of levels, in the spirit of deductive logic. Chapter II considers the essential characteristics of the evolutionary process which gave rise to life, interpreting organisms as the mechanisms through which genetic replicators (genes) influence the world about them in order to survive.

Chapter III examines the further implications of this replicator/vehicle view, analysing adaptations as elements in a hierarchy of function and mechanism. The highest element is the survival of the genetic replicators, while the mechanisms by which this is achieved are the vehicles, which then provide functional objectives for their mechanisms, and so on. A central conclusion of this chapter is that each of these levels of an adaptation can be assumed to be maximising, allowing a strong linkage to neoclassical economic theory.

Chapter IV advances the proposition that the most appropriate way to apply an evolutionary approach to behaviour is to study the psychological mechanisms that underlie it. After an introduction to the methodology of evolutionary psychology, its power is demonstrated in the resolution of the content-effect anomalies in the Wason selection task. The chapter finishes with a consideration of the selection pressures that shaped the comparatively large human brain.

Chapter V links together the previous chapters and applies them to the analysis of individual behaviour, and derives equations for maximisation in terms of each of the relevant vehicles. These theoretical discussions are supplemented by reviews of research indicating the existence of psychological processes instantiating such maximisation, and a concluding section which links each of the levels together.

Having developed a methodology for understanding human characteristics, chapter VI addresses the difficulty of creating predictive models of behaviour. In the first section *Homo biologicus* is presented as the appropriate interface between the complex and *ex post* descriptions produced by evolutionary psychology, and the requirement for general and operational models in the social sciences. This is followed by an investigation of particular forms of behaviour for which *Homo oeconomicus* provides inadequate explanations, but which are explicable within the *Homo biologicus* framework. The final sections examine how *Homo biologicus* could serve as a basis for the linkage of the human sciences, and consider some of the broader issues associated with the approach.

## II. The Elements of Evolution

### 1. Hierarchies and Reductionism

Life is the most complex phenomenon in the known universe, if complexity is conceived as existing when "complicated things have some quality, specifiable in advance, that is highly unlikely to have been acquired by random chance alone".<sup>1</sup> Simon has demonstrated that hierarchy is a fundamental principle of "the architecture of complexity"<sup>2</sup> and it is thus to be expected throughout the organisation of life. Simon's classic argument was made using a parable of two watchmakers, Hora who created subassemblies which were stable when he was interrupted, and Tempus whose watches fell apart and had to be completely reassembled if he was called away. Simon demonstrates that the former process is far more likely to be successful than the latter, and concludes that complex entities will generally use hierarchies to simplify their structures. Additional grounds such as "local administration", and "redundancy reduction",<sup>3</sup> reinforce the importance of hierarchy as an organising principle.

The only adequate scientific explanation of the nature of life is the theory of evolution,<sup>4</sup> first proposed independently by Darwin and Wallace,<sup>5</sup> which posits

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<sup>1</sup> Richard Dawkins, *The Blind Watchmaker* (Harlow, Essex: Longman Scientific and Technical, 1986) [hereafter Dawkins, *Blind Watchmaker*], p. 9. For a discussion of the meaning of complexity with respect to living things see *ibid.*, pp. 6-8.

<sup>2</sup> Herbert A. Simon, 'The Architecture of Complexity' *Proceedings of the American Philosophical Society* 106 (December 1962): 467-482 {reprinted in Herbert A. Simon *The Sciences of the Artificial* [1969] 2nd ed. 1981, pp. 193-229 (Cambridge, MA: MIT Press)}, pp. {200-205} [hereafter Simon, 'The Architecture of Complexity'].

<sup>3</sup> See e.g., Richard Dawkins, 'Hierarchical Organisation: A Candidate Principle for Ethology' in P. Patrick G. Bateson and Robert A. Hinde (eds.), *Growing Points in Ethology*, pp. 7-54 (Cambridge: Cambridge University Press, 1976), pp. 16-19 [hereafter Dawkins, 'Hierarchical Organisation']; Keith Nelson, 'Does the Holistic Study of Behavior have a Future?' *Perspectives in Ethology* (1973): 281-328, esp. pp. 311-317 [hereafter Nelson, 'Holistic Study']; Stanley N. Salthe, *Evolving Hierarchical Systems: Their Structure and Representation* (New York: Columbia University Press, 1985).

<sup>4</sup> Darwin himself did not use the term "evolution" in the early editions of the *Origin of Species*, making instead extensive use of the term "natural selection", and later "the survival of the fittest"; see Robert L. Carneiro, 'Introduction' in Robert L. Carneiro (ed.), *The Evolution of Society*: