The construction of reality
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MICHAEL A. ARBIB and MARY B. HESSE
To the Memory of

May Brodbeck
Richard Reiss
and
Bernate Unger

whose friendship and constructive criticism will be sorely missed
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Preface

*The Construction of Reality* develops an integrated perspective on human knowledge, extending ideas from cognitive science and philosophy of science to address fundamental questions concerning human action in the world and whether the space-time world exhausts all there is of reality. We seek to reconcile a theory of the individual's construction of reality through a network of schemas or mental representations with an account of the social construction of language, science, ideology, and religion. Along the way, we take account of much current research and debate in philosophy, linguistics, artificial intelligence, brain theory, cognitive science, evolutionary biology, social anthropology, history of religions, theology, and biblical and literary criticism. However, the reader will find no breathless pastiche here but a cumulative marshalling of evidence for a coherent and integrated view of the individual and social dimensions of human knowledge. We hope that it will stimulate the reader to find that within this integrated perspective there remains much scope for lively debate, particularly in our discussion of free will and of the reality of God.

For many people, even in today's secular world, God is the fundamental reality that gives meaning to human existence; for others, God does not exist, and whatever meaning human existence holds is to be found in society and in the more intimate groupings of family and friends. Even among people who believe in God, not all find value in natural theology, the study of the natural world for signs of God's existence and His plan; they prefer systematic theology, the study of God and His plan as revealed in sacred writings and institutions and in individual religious experience. This lack of consensus would seem to be compounded by the wide difference in religious and professional affiliations of the two people invited to share the Gifford Lectures in Natural Theology at the University of Edinburgh in November 1983. Michael Arbib is an atheist (but not without a sense of wonder) whose research includes artificial intelligence, brain theory, and cognitive science. Mary Hesse is an Anglican (but not uncritical of the pronouncements of her Church) whose research includes the history and philosophy of science. Our tasks since June of 1981 – when we first met, summoned from our mutual ignorance of each other by the invitation from Edinburgh's Gifford Committee – have
been to build these differences into a thesis and antithesis and to define a
new synthesis that meets Lord Gifford's brief in a manner appropriate to
the century that has passed since he wrote it.

The common core in *The Construction of Reality* is given by the theory
of knowledge in all its aspects. Arbib has sought to develop a theory of
schemas to explain how the individual brain – of animal, human being, or
robot – represents the world around it. In contrast to this individualistic
emphasis, Hesse has taken a more social and holistic view in her attempt to
understand the interactions of pragmatic criteria and social consensus in the
development of physical theories. One clear challenge for synthesis, then,
is to understand better how individuals can become members of, and can
in turn change, a community or society. The other challenge, posed by the
charge of the Gifford Lectures, is to raise our sights from the epistemology
of visually guided behavior or physical science to that most pretentious, yet
compelling, of subjects – our knowledge of ultimate reality. Can this knowl-
edge only be given by the sciences? Is it to be found in the teachings of some
religion? Or can it, at best, be approximated in a network of shifting meta-
phors that connects the most abstract of concepts, scientific and religious,
with the realities of everyday life? We argue for the last viewpoint, only to
discover that it does not preclude the others. We seek to construct a
philosophical framework in which the discussion of honest differences can
continue with new clarity.

Schema theory probes the interrelations between and the mechanisms of
perception, action, and memory, relating these to intelligence, language, and
culture. Evolution has structured our brains so they are able to provide the
basic schemas for manipulating in and locomoting about our world, with
senses to monitor our interactions and motivational systems to evaluate the
outcomes. Schemas lay the basis for the consideration of actions to be taken
to ensure certain outcomes in interaction with our environment and other
people. The schemas “represent reality” to the extent that any departure
of outcome from prediction remains within tolerable bounds. “Reality” can
often be assimilated to pre-existing schemas, yet, as Piaget has explored,
it will often in its turn dictate the accommodation of schemas and the devel-
opment of new schemas to adapt to new circumstances of a wider range of
interactions.

The challenge is to build on a theory of schemas that represent immediate
experience (it hurts to kick a stone or to cause embarrassment) in order to
understand the construction of social reality and what it tells us about
knowledge of the sciences and of God. Much of the construction of reality
is guided by convention. An individual’s development is shaped by previous
structuring obtained by society – as in the “rules” of language and social inter-
course. Within this context, we can then analyze the need to find order –
be it in the scientist’s search for unifying principles or in society’s search for
the good life or the quest for God. To the extent that the formation of
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these unifying schemas is a social process, we may understand the diversity of the gods or pantheons of different societies or the differing emphases of scientific knowledge and research in different communities and at different times. The scientist would insist that the differences of knowledge reflect the imperfection of varying approximations to a common reality. The theist (but not the atheist) might assert that the same is true of different religions. One of our tasks, then, must be to compare different views of how religious beliefs may be formed, seeking to sharpen methodological tools for analyzing how history-driven or reality-driven a schema might be – always conscious that the reality with which we poor humans strive to compare the schema is itself a schema, albeit at a more abstract or higher level.

Some readers of The Construction of Reality in draft form have expressed curiosity as to the provenance of the project and the views we each brought to it, wishing to gauge how far our opinions have converged and to get a fuller sense of the dialogue that was at work. A full response would burden this preface unduly, but the following few remarks may be helpful. At the start of our collaboration, Arbib had given much thought to the construction of reality in terms of a schema theory addressing mechanisms for perception, action, and language embodied within the individual. He had also pondered the implications of this schema theory for philosophy of mind but was little informed about issues in theology or philosophy of religion. By contrast, Hesse had explored the history of physics and the structure of scientific inference. Moreover, she had extended her concern with the social construction of knowledge to anthropology and hermeneutics, delivering the Stanton Lectures in philosophy of religion at Cambridge University in 1978, 1979, and 1980. Both of us, however, shared an initial scientific training, which meant for Hesse as well as for Arbib a preference for monistic theories of mind and brain. Arbib interprets this preference in terms of a physical naturalism: there is nothing that we want to explain about the mind/brain that is not in the spatiotemporal world. Hesse interprets it in a unified view of the human person, brain, mind, and soul, in a single creation, all parts of which exist in appropriate creaturely relations to the Creator.

From the start, we agreed to write a coherent book that could also serve as the basis for the lectures, rather than preparing two separate sets of lectures, or having one of us prepare a set of lectures to which the other would reply. Hesse taught Arbib to temper a tendency to reduce all knowledge to brain mechanisms with a fuller understanding of the multiple levels, from neural to social, at which knowledge has a quasi-independent existence. She also helped him come to understand the importance of anthropology, and of the questions asked by theologians even though he remained resistant to their answers. Arbib taught Hesse much about artificial intelligence, brain theory, and cognitive science and convinced her of the importance of both Sigmund Freud and Jonathan Edwards in exploring the hermeneutic dialogue between science and religion.
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We then worked hard to extend schema theory to embrace social constructs as well as individual mental representations. We achieved so much convergence that is came as a great joy to discover that we differed on the nature of free will! The outcome of our debate on this topic is in Chapter 5, where the voluntarist is Hesse and the decisionist is Arbib. We had many probing discussions about religious belief in the course of our collaboration and refined our own beliefs in the process. Hesse's world view informs the Chapter 11 presentation of the Bible as a Great Schema embodying a reality transcending space and time; Arbib's world view informs the secular schemas of Chapter 12. But even with these differences, the authors have collaborated on every chapter of this book, and the reader should not seek too clean a separation of our contributions. For example, Arbib introduced Hesse to Northrop Frye's The Great Code, thus stimulating her to view the Bible as being, rather, “the Great Schema”; Hesse provided the analysis of E. O. Wilson's sociobiology for Chapter 12. Nonetheless, we have agreed that final editorial authority for a given chapter should rest with the author whose lectures dealt more fully with the topics of that chapter. In this way, Hesse has sign-off responsibility for Chapters 1, 5, 8, 9, 10 and 11, and Arbib has the last word in Chapters 2, 3, 4, 6, 7, and 12.

We express our thanks to our friends in Edinburgh and to the Gifford Committee for the invitation that made this collaboration possible; to the Institute for Advanced Study in the Humanities at the University of Massachusetts at Amherst, which was host to a Faculty Seminar in the Fall of 1983 in which we tried out many of our developing ideas; to the National Science Foundation for partial support of our study of language; and to our friends, colleagues, and students. Arbib thanks the University of Massachusetts for the freedom afforded by a Faculty Fellowship Award in 1981; Bernate Unger for her detailed critique of an earlier draft, with its stress on the person; and Richard Noland and Mason Lowance for valuable discussions of Freud and Edwards, respectively. We thank Gwyn Mitchell, Louise Till, Rae Ann Weymouth, Barbara Nestingen, and Darlene Freedman for their help with version after version of electronic typescript.

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