

# Preface

I am not a cynic. In this century, it's fashionable to despair about changing human society for the better because so many recent attempts seem to have failed. Not only have most communist and socialist revolutions been corrupted and then overturned, but Western liberal democracy has not yet reached its goal of equal opportunity of all. Also, the Information Age means that scientific and technical knowledge is becoming more specialized, seeming to get not only out of control, but out of the average educated person's reach.

So why do I continue to be hopeful? It is out of a belief that there are ultimate values to life, beyond mere survival and propagation of genetic material. While human beings fall short of living by these values most of the time, we are somehow aware of these values and frustrated by our shortcomings.

Since we are biological organisms, *both* our values and our failure to live by them must be somehow influenced by our biology — particularly the biology of our brains, which this book is about. As a scientist, I have faith that science, by helping us to know ourselves much better than ever before, can add its power to the global forces of progressive change.

While the Information Age holds out the threat of dehumanization, it also holds out a promise. As advanced communication makes people all over the globe more aware of how others live, the world-wide pressure for greater democracy is accelerated. In the countries that are already nominally democratic, this takes on the form of pressure for more self-determination in our personal and work lives. Besides, as many futurists, politicians, and business leaders already recognize, the complexity of our global communication system is more suited to democratic structures of decision making rather than rigidly hierarchical structures. I will argue that our *minds* are more suited to democratic structures as well!

As crime and violence have increased and community supports have weakened, there has been a widespread call for return to ethical values, or *virtue*.<sup>1</sup> My book echoes this sentiment but does *not* call for going back to the past, which is impossible anyway. Modern theories describe societies and other complex systems as being able to achieve stability in more than one possible state. So, rather than yearning

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for the past stable state of hierarchy, patriarchy, and authoritarian religion, we can advance virtue better by striving toward the future stable state of equality, cooperation, and freedom of conscience. How can we learn more about ourselves in order to achieve that?

This book is about the nature of the people making up our social structures, and how people are affected by different types of interactions. It tries to bridge the gap between scientific knowledge and human potential. It was born in the creative chaos of the student 1960s. This is a period in American history that has been recently reviled as a source of ideas that at worst led to moral decay, and at best were unworkably idealistic. But I agree with those scholars who hold to the much more positive view that the Sixties, while full of setbacks as well as triumphs, were a valuable time for experimentation in creating partnership-oriented institutions.<sup>2</sup> This type of risk-taking is actually needed now more than ever due to the strains of the global economy.

One of the valuable traits of the Sixties was the quest for social relevance. I wanted as did many of my peers to apply my professional training (in this case, mathematics) to solving social problems. The Vietnam War and the turmoil of American cities led me to ask some psychological questions: What motivates government policy makers to do things that may not be in society's best interests? And what motivates the public as a whole to accept their policies, even if maladaptive? It didn't seem that practical politics and economics could explain all of it: there had to be an attitude component as well. My belief in science made me feel that attitudes could be illuminated by understanding functions of the human brain in feedback with its environment.

The first opportunity to pursue these ideas more deeply came in 1968-1970 when I received a Public Health Service commission at the National Institutes of Health in Bethesda, Maryland. Being among biologists, I got immersed in neurophysiology, neuroanatomy, physiological psychology, and animal behavior, through reading, course work, and interactions with senior scientists. Two of these scientists became mentors: Paul MacLean, behavioral neuroanatomist and developer of the theory of the triune brain (instinctive, emotional, and rational), and John Calhoun, behavioral ecologist, futurist, and developer of the theory of the Compassionate Revolution. That period was followed by an interdisciplinary program of

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doctoral study (1970-1974) at the Massachusetts Institute of Technology. There my mentor was Stephen Grossberg, a major pioneer in efforts to bridge mathematics and psychology by means of model *neural networks*.

All three of these scientific innovators (Calhoun, MacLean, and Grossberg) are referenced extensively in this book. Through their warm humanity combined with careful scholarship, these three have reinforced my faith that scientific study of the brain and mind can yield answers to great philosophical questions. Ultimately, this yields clues for organizing society based on better knowledge of human nature. As this book illustrates, precise answers to most great questions about the mind are still to come. However, modern scientific methods of brain study, ranging from PET imaging to computer simulation to mathematical theories of “fuzzy” concepts, are already suggesting theories which should bring some of these answers within reach early in the next fifty years.

This book builds on recent advances in brain science and neural network theory, but is not a technical introduction to those fields. Rather, it is an inquiry that moves quickly to the implications of those fields for human conduct, ethics, and decision making. It assumes that everything in nature, including thoughts, feelings, beliefs, and intuitions, has some scientific basis. Much more detailed justifications for this assumption, based on the epistemology of brain and mind, can be found in books by other authors, such as Patricia Churchland and Richard Eiser.<sup>3</sup> Scientists are often accused of being esoteric and leaving the general public behind, so my goal is to discuss an important area of science in terms of what it means for people as a whole.

Hence, my discussion of technical aspects of the field is somewhat impressionistic rather than precise, highlighting those aspects of the work that may have implications in other areas of life (e.g., psychology, politics, and religion). This is particularly true of the discussion of modern mathematical and computational models from neural network theory. These models are as yet crude approximations of how parts of real brains work, but already full of useful metaphors and capturing some of the essentials of behavior. It is the models as metaphors that are stressed here, and in most cases, detailed descriptions of

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the networks are omitted. At a few points in the book links are provided to such network descriptions for those interested in further study. A technical overview of the whole field is provided in my textbook.<sup>4</sup>

Conventional wisdom says that scholarship, particularly in the sciences, means detached, objective observation, without passion or values. My book breaks completely with that convention! It assumes certain human-enhancing values, then pursues the investigation of how our brains embody these values and why we don't always live by them. Its discussion suggests that living in accordance with our best potential is a difficult quest that requires *both* passion and reason.

The conclusions of this book combine challenge, warning, and hope. The challenge is that the complex dynamics of each of our brains harbor a potential for tremendous good. The warning is that our brains also harbor a great danger of wasting that potential. The hope is that our awareness of who we can be, combined with the increasing failure of traditional paradigms for day-to-day life (the title's "common nonsense") can — probably after many convulsions — generate creative ways of acting ("common sense").

The contrast that will emerge between common sense and common nonsense, when applied to society, largely mirrors Riane Eisler's distinction between *partnership* and *dominator* social patterns.<sup>5</sup> Some of the new paradigms we need to encourage have a successful history; others have up to now only been dreamed of by poets, mystics, and utopians. In this age of widespread cynicism, I join forces with some of our most optimistic writers about the future, such as Ralph Abraham, Patricia Aburdene, John Calhoun, Riane Eisler, Marilyn Ferguson, John Naisbitt, and Alvin Toffler.

I am often asked how a field as precise as mathematics can yield any insights into something as imprecise as human behavior, particularly its emotional and spiritual aspects. This question can be answered on many levels. First of all, knowledge is a continuous web rather than a set of distinct "boxes" with sharp boundaries between them. One thinks of the spectrum from most to the least precise as comprising mathematics, then the natural sciences, then the social sciences, and finally the humanities — but philosophy, usually classified with the humanities, goes back to inform the foundations of mathematics. Second, any phenomenon in nature or society can be described at many different levels, so its

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understanding engages many different traditional fields. This is why the most creative research is so often interdisciplinary. As the social psychologist Richard Eiser stated:

In crossing over from the “external” world of things to the “internal” world of feelings we have *not* passed through some door beyond which empirical methods and the rules of mathematics have no sway. Perhaps it is misleading even to think of there being any door at all ...<sup>6</sup>

Third, modern mathematics has recently evolved methods for modeling complex phenomena that are hard to predict. Some of these methods have been described as *chaos theory*.<sup>7</sup> Chaos is actually one of many interesting things that can happen in the larger field of *nonlinear dynamical systems* (see Fred Abraham’s recent book for a visual introduction with few equations<sup>8</sup>). This is the study of how a large number of mutually interacting variables change over time. Concepts of nonlinear dynamics will play a role in the discussions in this book — not through equations but through pictures and conceptual descriptions.

Finally, the precise language of mathematics can provide metaphors for imprecise concepts, just as the precision of standard English spelling and pronunciation masks the imprecision of the meanings it represents. It is in constructing metaphors that mathematical — or more generally, theoretical — training has informed this book the most. The ability to abstract can lead one to see analogies across apparently different domains; for example, I will draw an analogy between behavior of a person with frontal lobe damage and behavior of an entrenched unresponsive hierarchical social system. Theory is often distrusted in our practical, business-oriented world, but the social psychologist Kurt Lewin said that “There is nothing more practical than a good theory.”<sup>9</sup> Theoretical understanding, if leavened by a pragmatic outlook<sup>10</sup> that seeks to apply it to real-world problems, helps us look beyond appearances to reality, beyond short-term profits to long-term social health, beyond prejudices to accurate characterizations, beyond “sound bites” to history in the making.

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This book is divided into three major sections, although similar ideas run through all of them. So parts of the book may be considered “holograms” for the whole.\* Each section starts with presenting results about brain function and individual psychology, then progresses toward the implications of these results for social organization.

The first section of this book outlines an inquiry about human nature and choice. It starts with the statement that we often fall short of our best potential — or, in Abraham Maslow’s terms, of self-actualization — and rewords it in a more optimistic manner: we have what it takes to improve on where we are at any given moment. The second section explores the cognitive basis for self-actualization. It culminates in “how we get there from here,” with examples from life style experimentation, psychotherapy, politics, and work place management. The final section introduces some scientific results about the actual effects of different types of day-to-day environments on people’s mental functions. It concludes with a vision of a future world that is ideal, perhaps, but within the abilities of our mental and spiritual selves, and delightful to plan for.

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\* I am using “hologram” itself as a metaphor, not in its precise meaning that has to do with the physics of lasers (see Caulfield, John, The wonder of holography, *National Geographic*, March, 1984).

# References

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1 Bennett, 1993.

2 Anderson, 1996; Gitlin, 1987.

3 Churchland, 1986; Eiser, 1994.

4 Levine, 1991a.

5 Eisler, 1987, 1995.

6 Eiser, 1994, 3.

7 Abraham, 1994; Abraham and Gilgen, 1995; Gleick, 1987.

8 Abraham, 1992.

9 Marrow, 1969, viii.

10 James, 1907.