The Nurture Assumption: Why Children Turn Out the Way They Do
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Zen and the Brain: Toward an Understanding of Meditation
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Science, Theology, and Consciousness: The Search for Unity
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Handbook of Neurolinguistics
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Child's Play: Myth, Mimesis and Make-Believe
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Moving Psychology Toward the 21st Century

Science, Theology, and Consciousness: The Search for Unity
by John Boghosian Arden

Review by Charles T. Tart

It is natural for us to model our own activities on those of more successful people, so given the enormous success and progress in the physical sciences in the past century, it is natural for psychology to model itself on them. Copying the behavior of more successful people is a partly sensible and a partly natural (but not completely rational) human desire for acquiring prestige and success—with the latter motivation carrying its own costs.

Some psychologists have always worried that they are losing the essence of their own subject matter in doing this, however. Because reductionism and materialism seem to have worked so well in the physical sciences, it then becomes only a matter of time until psychology is seen as a crude, intermediate level of knowledge until all human behavior is "really" explained by being reduced to specific brain functioning. In this imagined future, one would not be so crude as to say you are "having an insight," for example, but rather explain it as "brain area 345,567,123 was exchanging information with brain area 1,345,678." Then we would be "real scientists," and not have our bad case of "physics envy" anymore. (This is not my personal opinion, of course, as I like to define myself as an old-fashioned, conservative experimental psychologist who thinks that psychology is indeed the study of the mind.)

Before training as a psychologist, I worked in both ham and professional radio, had some college training as an electrical engineer, and tried ever since to keep up with science in general. This broad interest in science occasionally led me to amusing incidents that illustrate some of psychology's problems that Arden deals with in Science, Theology, and Consciousness: The Search for Unity. For example, I sometimes mentioned to other psychologists the developments in quantum physics that I had read about and was asked by them if I was talking about parapsychology! At an implicit level, Newtonian physics is alive and well in much of psychology, even today.

Arden's book is an excellent attempt to help us move beyond an overdependence on the science of the past century and broaden our focus, methodology, and explanatory power by moving into the much larger framework of contemporary science and the developing science of the 21st century. This naturally involves questioning a lot of concepts and beliefs that seemed to have served us well, and as Arden notes, "too many of the obsolete concepts and beliefs I will question are held near and dear to the hearts of the bulk of humanity" (p. xii). Lest we think he is merely talking about theology and popular psychology, he also notes "the other beliefs, concepts and methodologies that I will clarify and question include: determinism, 'linearity,' 'objectivity,' and 'reductionism'" (p. xii).

In eight clearly written chapters, Arden indeed questions such concepts in detail and shows how modern and general science developments in such areas as evolutionary theory, chaos theory, quantum physics, complexity theory, and philosophical inquiry have shown that the world is best considered as interacting, dynamic, and nonlinear systems, not static entities reducible to fundamental particles. The world needs to include almost all psychological topics. The reductionist, deterministic, and linear approach that was taken in the past was good for what we knew then, but if we do not expand, we cannot hope to make real progress or to fit the future psychology into the rest of future science in general.

As in any attempt by one writer to cover such a broad area, experts in each special field are bound to quibble and take exception with the exact form of presentation that Arden uses. But, in general, I think he has an excellent understanding of the broad ranges of knowledge and methodology of modern science. Thus, my feeling is that this is an excellent introduction to those who want to become acquainted with its broad sweep and its implications for psychology.

To look at one area of the book from an expert perspective, I have devoted part of my career to experimental psychology, so I was particularly intrigued to see that Arden seriously deals with this area, one which is usually taboo for most mainstream psychologists. It is taboo not because there is not compelling data there, but because ostensible parapsychological phenomena (like telepathy or clairvoyance, for example) are things that do not fit into a Newtonian world view, and so tend to be rejected a priori rather than as a result of normal scientific scrutiny of the data. Sadly, my experience is that vehemence in rejection of parapsychology as an area of scientific inquiry is usually strongly and negatively correlated with actual knowledge of the data. Arden has a good acquaintance with experimental data in this field but, more importantly, he also shows that when one draws on modern scientific views about the physical universe, particularly with many of the startling (to common sense) implications of quantum physics, these Newtonian a priori objections to looking at parapsychological data are superseded.

It is no wonder that my colleagues sometimes thought I was talking about parapsychological data when I was discussing physics data: the "spooky" physicists use that word for this, apparently instantaneous communication between particles entwined on the quantum level.

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when they are totally isolated by Newtonian standards and only the consciousness of an observer intervenes, boggles common sense. Similarly transpersonal experiences, where people have life-changing experiences in which they seem to be part of a bigger reality than just their ordinary physical and personal selves, may have a place within the larger scientific view of the universe. Indeed, they may represent a real evolution of consciousness, even if they do not make sense within the narrower Newtonian view.

When I was being trained in psychology in the 1960s, consciousness was still largely a taboo topic because of the influence of behaviorism and because those in the field wanted to be an “objective,” “scientific” field rather than part of the humanities or philosophy. This bias was very powerful in determining what research was legitimate, even though my fellow graduate students and I really appreciated the common quip that the best way to predict a human being’s future behavior was to ask them what they planned to do next and to pay attention to what they said! In the past decade, particularly stimulated by the rise of cognitive and computer science, consciousness per se has become a much more legitimate topic of psychological investigation, with interesting results. But, as I stated earlier, Newtonian physics is alive and well in the implicit assumptions of much psychology, therefore, a lot of the current research on consciousness is done with the implicit or explicit goal of reducing it to physiological functioning of explaining it “away.”

But such naive reductionism is one of the things that Arden shows us has to go if one incorporates the broad sweep of contemporary and future science.

As I have demonstrated throughout this book, there exists no one way to explain consciousness. Each individual self-system reflects an infinite number of fractal microystems and is interconnected at every level with other aspects of the biosphere. In other words, the interconnectedness affecting all aspects of consciousness prohibits any reductionistic description of consciousness. Rather, consciousness reflects and thrives on interconnective relationships (p. 128).

I must admit that the simplistic, reductionistic, Newtonian universe has a lot of personal appeal to me. I can understand most of it in principle; I’m used to it, and all this interconnectivity sure looks complicated! But we cannot continue in this simplistic fashion; Arden’s book is an excellent way to get started in expanding our personal and professional horizons and in expanding the future of psychology.

The Talking Brain

Handbook of Neurolinguistics

by Brigitte Stemmer and Harry A. Whitaker (Eds.)


Review by Niels Birbaumer

When Noam Chomsky founded modern linguistics in the 1950s and 1960s, he vigorously denied that brain science may assist in building a coherent concept of language and speech within this century. After receiving *Handbook of Neurolinguistics* for review, I was inclined to write a devastating critique of a premature publication of a premature field. Neurolinguistics was and still remains in many fields a subdiscipline of 19th-century phrenology, basically repeating over and over again that language systems are located in the left perisylvian cortex with expressive speech being localized frontally in Broca’s area and speech comprehension in Wernicke’s area. What an intellectual and scientific achievement! Chomsky’s aversion toward brain science and the neurologization of language is comprehensible vis-à-vis such trivialities. The sheer endless list of case studies with aphasia after infarction or lesion of the left hemisphere since Broca’s (1865) pioneering publication in 1865 did not confirm a simple localization of language and speech, but the Broca-Wernicke model remained for more than 100 years and was revived in modern times by Geschwind and Galaburda (1987) who proposed a fixed anatomical connection between Wernicke’s temporoparietal region and Broca’s inferior prefrontal zone, the left-hemispheric fasciculus arcuatus. Expressive speech and speech comprehension became at least anatomically connected. These anatomical models could not explain any mechanism of the language apparatus nor were they compatible with the clinical data that related the enormous variability of language disorders to a bewildering chaos of brain lesions in both hemispheres. Before the background of this tradition, I expected nothing at best from a handbook of neurolinguistics.

So often, however, opinions are unmasked as prejudices through confrontation with reality. The *Handbook of Neurolinguistics* and the whole field as represented here turned out to be (at least in most of the 47 articles) a valuable source of a mature field and of new information. The book is subdivided into five parts. Each part contains about 10 short papers, except for the first part on history and the last on resources in experimental neurolinguistics, written mainly by the first editor. Part II describes clinical and experimental methods, Part III discusses experimental neurolinguistics proper, and Part IV discusses clinical neurolinguistics. The editors, both respected researchers in the field—Whitaker being a widely cited pioneer of the modern network approach to neurolinguistics and Stemmer a younger internationally experienced German neuropsychologist—assembled a group of 70 authors from the United States, Canada, Europe (both continents well balanced), and South America and managed to keep them within the limits of several pages only and at the same time asked them to present the “most recent advances in the field and to point the reader to older literature by referring to review articles” (p. xxv). This was a remarkable achievement. Particularly useful is Part V, discussing transcript methodology, rehabilitation software, journal and book resources and resources on the Internet, and an excellently prepared index and reference list. What is so remarkable about the de-