Vignettes: Papers in Press

Since the goal of most researchers is publication, not lecturing, most scientific conferences are rehashes of old work punctuated by tantalizing previews of forthcoming articles. Those with nothing new to say speak too much; those with real news, too little.

—*Barry Werth*, in *The Billion-Dollar Molecule: One Company's Quest for the Perfect Drug* (Simon and Schuster)

Not long ago, I met a physicist who told me that he had never had a manuscript rejected by a journal editor. He was proud of this, but I found his statement troubling and was not sure why. Perhaps it was envy, because I have had my share of rejections? The more I thought about it, the clearer the answer became: He had not been reaching far enough.

—*Robert J. Weber*, in *Forks, Phonographs, and Hot Air Balloons: A Field Guide to Inventive Thinking* (Oxford University Press)

became paramount. Economics and demand make methanol (CH_3OH) the current product of choice. The necessary carbon would be furnished by shipments of coal. This would be converted mainly to CO with the oxygen produced by electrolysis and steam. The CO would then be reacted with hydrogen to form methanol. A large-scale floating plant would produce 1750 tonnes per day that would be stored and later transferred to a tanker about once a month.

Careful analyses of potential problems, detailed designs of OTEC plant ships, and consideration of costs occupy most of the book. Part of it is devoted to some limited practical experience. The state of Hawaii has supported small-scale OTEC plants based on land, but near deep water. Byproduct nutrient-rich cold water is valuable for mariculture and for cooling. Private enterprise assembled and operated near Hawaii a small seagoing OTEC plant that was technically successful but not financially viable.

The costs of oil and natural gas are currently such as to discourage commercial construction of large-scale OTEC plants. However, U.S. production of oil continues to decrease and imports climb. In view of many long-term uncertainties about energy consumption and supplies such as effectiveness of conservation measures, ability to pay for imports of liquid fuels, and greenhouse warming, this nation should be more vigorous in developing alternative energy sources.

With the knowledge set forth in *Renewable Energy from the Ocean* and its bibliography, a 40-MWe seagoing pilot plant could be constructed. Cost would be about $200 million in 1990 dollars. Construction could be relatively rapid, since most of the components would be commercially available. The authors provide extensive evidence that with experience costs of OTEC would be substantially reduced and that ultimately production of methanol and ammonia by OTEC could be made cost-competitive.

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Language and Its Disorders

Understanding Aphasia. HAROLD GOODGLASS. Academic Press, San Diego, CA, 1993. xii, 297 pp., illus. $54.95 or £42. Foundations of Neuropsychology.

Aphasia is the loss or disruption of language abilities following a focal brain injury. The most common cause of aphasia is stroke, which has some effect on language faculties about 20 percent of the time. Aphasia is a significant public health problem: it is estimated that more than a million Americans have some form of aphasia, with frequently devastating consequences for employability, independence, and quality of life.

But aphasia is much more than a medical issue. For more than a century, the study of aphasia offered the only means available for addressing the question of how language is represented in the brain. Until the very recent development of technology for functional brain imaging, theories about language-brain relationships were based entirely on studies correlating damage in particular brain regions with specific aphasic symptoms. The single fact about aphasia that allowed its study to play this role, and the fact that continues to make it interesting today, is that its effects on the language system are varied and often quite selective. For example, patients may be able to produce words as names for objects that they are allowed to touch, but not for objects that they take in only by sight; other patients seem to lose the ability to understand words drawn from a single semantic category (animals, body parts) but to have no difficulty with words in other categories. Perhaps most paradoxically, some patients have great difficulty producing words that are the most frequent in the language—words such as "the" and "of"—while easily producing much longer and less frequent words; other patients show precisely the opposite pattern.

Understanding Aphasia is the long-awaited work of a man who has arguably done more than any living person to describe systematically the many varieties of aphasia and to bring some order and coherence to their study. For the past several decades, Harold Goodglass and his colleagues at the Boston University Aphasia Research Center have led the movement to supplement the interesting and important, but largely anecdotal, case reports of clinicians with rigorously controlled and psychometrically valid tests of patients' language abilities. This book is an appropriate testament to Goodglass's career, as it succeeds in setting out an orderly description of aphasia and its long history while making clear how difficult and confusing its study can be. It contains many well-chosen examples of the speech, writing, and other performances of individual patients the author has seen, providing an informative introduction to aphasic phenomena for those new to the topic.

There is much more of interest here, and some surprises, for specialists who are already familiar with the field of aphasia research. The author never ventures far from questions of neuroanatomy, returning repeatedly to discuss what is known about the location of the brain lesions that are associated with particular aphasic manifestations. At the same time, he reviews in some detail studies that are much less concerned with neuroanatomic correlation than with using the patterns of symptom dissociations found in aphasia to build and test cognitive models. A recurring theme is the essential similarity of the guiding neuroanatomic model of language-brain relationships and the information-processing ("box and arrows") models of normal language organization: both involve sets of discrete processing components through which information passes in serial order.

Although these types of models still constitute the primary explanatory approach to contemporary aphasia research (and have motivated and guided Goodglass's own work), much of this book is devoted to detailing their limitations.

As an alternative, Goodglass looks to connectionist computer models that advocate the adoption of interactive activation mechanisms for parallel and multidirectional communication among information sources. More surprisingly, he also adopts from connectionism the idea of distributed, association-based learning (and retention) of information, allowing the argument, for example, that entities such as a "lexicon" of abstract word representations can be jettisoned in favor of patterns of learned associations among components of meaning and sound. The adoption of parallel-processing mechanisms in no way requires the assumption of completely distributed representations, although they appear here as necessarily linked. The advocacy of a distributed, association-based activation mechanism in the realm of language processing is highly controversial. The challenge, for Goodglass and others advocating such radical alternatives to linguistically defined, modular components, is to find ways of formulating such notions into falsifiable hypotheses.

There is much to argue about in the author's attempts to synthesize the diverse results that constitute the "state of the field." In fact, he has made no attempt to avoid the troublesome controversies that have dominated aphasia research for the past ten years: the proper role of aphasia classification in research; the relative importance of linguistic theory and cognitive science in understanding aphasia; the effect of premorbid differences among individuals on the development of aphasic symptoms. His views on these and other issues, which are clearly stated, should stimulate discussion among aphasiologists for some time to come.

This volume thus serves not merely as a summary of this fascinating and contentious field from a man who helped to shape and define it. It constitutes a scholarly yet practical description of aphasic phenomena and the history of their study at the same time as it breaks new ground in attempting to fit the diverse pieces of the puzzle into a coherent theoretical framework. *Understanding Aphasia* provides an accessible introduction to the topic for the interested scientist while raising many substantive issues for debate among aphasia researchers.

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Books Received

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Aquatic and Surface Photochemistry. George R. Helz, Richard G. Zepp, and Donald G. Crosby, Eds. Lewis, Boca Raton, FL, 1994. xx, 552 pp., illus. $85. Based on a symposium, San Francisco.

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