icant interpretative essays (particularly those by Jewell, Wrigley, Digby, and N. Keyfitz), it does not satisfy the demands of either the specialist or the general reader. The former will want to refer to the more detailed and developed arguments that the authors summarized for the conference; the papers here do serve as a useful bibliographic guide to the literature. The latter needs a more coherent treatment of the subject. *Malthus* by William Petersen (Harvard University Press, 1979) is recommended as a lively, engaged interpretation of his thought and its significance in the social sciences.

DANIEL SCOTT SMITH
Department of History, University of Illinois, Chicago 60680

Neolithic Advances

The Neolithic Transition and the Genetics of Populations in Europe. ALBERT J. AMMERMAN and L. L. CAVALLI-SFORZA. Princeton University Press, Princeton, N.J., 1984. xvi, 176 pp., illus. $25.

This book is an interesting attempt to bridge two disciplines—genetics and European prehistory—that have tended to ignore each other. What the authors have tried to do is to explain, first, the spread of agriculture across Europe 8000 years ago and, second, the present-day distribution of European gene types. Their approach is attractively simple. First, they examined the archeological evidence to see if it indicates a Near Eastern origin for the earliest agriculture in Europe. This it does, by and large: the earliest farming settlements in southeastern Europe are only slightly later than their Near Eastern counterparts but are considerably earlier than those in northwestern Europe. The second stage was to decide if this "wave of advance" is most reasonably explained as the result of population movements by farming peoples who gradually infiltrated the territories occupied by local Mesolithic hunter-gatherer groups. In the authors' opinion, the growth rates of these early agricultural societies are likely to have been sufficiently high for new settlements to be continually founded ever deeper inside Europe, so that farming could have become established over the continent within two or three millennia through colonization. The third and most interesting part of their work was to see if the distribution of present-day European gene types can be explained as largely residual from this expansion of Neolithic agriculturalists. By using multivariate techniques, they reach the conclusion that the genetic makeup of modern Europeans still reflects these population movements of 5000 to 8000 years ago.

In this pioneering attempt, the authors have been courageous, and admirably tenacious over a 15-year period. There are, however, several problems that need raising. The first pertains to the archeological aspects of their work. A description of what happened does not in itself provide an explanation of how it occurred. Few would deny that there was a "wave of advance" of agriculture across Neolithic and later Europe: this has been amply demonstrated by carbon-14 dating. The question is whether this indicates agricultural colonization alone. Prehistorians need to maintain a careful balance between explanations that are "elegant" and simple and those that are naïve and simplistic. The principle of parsimony works well enough for many of the sciences; monocausal explanations do not, by and large, for historical disciplines. Phenomena as large-scale and far-reaching as the adoption of agriculture (or for that matter the growth of civilization, or the origin of hierarchically organized societies) are unlikely to have been caused by one process alone. These days, prehistorians are becoming wary about envisaging the adoption of agriculture in Neolithic Europe as simply an earlier version of the 19th-century agricultural colonization by Europeans of the Americas, Africa, and Australia. Europe's first farmers lacked the overwhelming technological superiority over the final Mesolithic populations that their recent counterparts had over predecessor populations in the areas they colonized. Mesolithic groups may also have been less incapable of adopting agriculture than has customarily been supposed. Unfortunately, Ammerman and Cavalli-Sforza have not broken new ground in their adherence to a venerable monocausal explanation of how farming first became established in Europe.

But how then to explain the present-day distribution of European gene types? That is indeed an interesting and worthwhile question. A modest assumption would be that the present-day distribution is a palimpsest reflecting numerous ethnic movements over several millennia. One that certainly occurred—and that may still be traceable—was at the end of the last ice age, when late Paleolithic and early Mesolithic groups moved northward into areas previously uninhabitable. Others much more recent occurred in medieval, classical, and most probably late prehistoric times. All these are better documented than the population movements that may have occurred in the Neolithic. Unraveling the genetic consequences of all these movements would be difficult but fascinating. It would, I suspect, substantially modify the conclusions reached by the authors on the importance of population movements during the early Neolithic in Europe.

As a contribution to our understanding of the spread of agriculture across Europe, I would not rate this work very high. However, the approach it represents merits serious consideration by prehistorians and geneticists. The authors are rightly enthusiastic about its potential and about the value of extending it to other areas. Though not overly happy about the baby, I would not throw away the bath water.

R. W. DENNELL
Department of Prehistory and Archaeology, University of Sheffield, Sheffield S10 2TN, England

Behavioral Neurology

Cerebral Dominance. The Biological Foundations. NORMAN GESCHWIND and ALBERT M. GALABURDA, Eds. Harvard University Press, Cambridge, Mass., 1984. xii, 232 pp., illus. $27.50. From a conference, Boston, April 1983.

The late Norman Geschwind was intensely involved with his ideas and always committed to putting them into a historic context. On one occasion he lectured with vigor about the corpus callosum and his own not inconsiderable role in understanding the structure. Robert Joynt, the next lecturer and an old friend of Geschwind's, opened his own paper with the observation, "Norm, there is an old saying in vaudeville that there is nothing harder than to follow a dog act." The person in the large auditorium laughing the loudest was the intellectual advocate himself, the irresistible Dr. Geschwind.

For the past 20 years Geschwind and his colleagues have led the field of clinical behavioral neurology. Geschwind himself was almost single-handedly responsible for making behavioral neurology a field of study in the United States. His classic set of papers on disconnection syndromes, published in 1965, set neurology, anatomy, and psychology spinning and established a mechanistic context for the study of higher integrated functions that remains singular. In the ensuing years he made countless contri-