instead of physics, with its focus upon nuclear and space debates.

Certainly the authors of the national case studies (or "empirical plausibility probes," in the editor's characterization) have some difficulty with the framework. Thus, while Solingen summarizes Kapur's analysis of India as showing not merely the convergence of state and science, but even that (p. 16) "scientists *captured* political power by creating a state within the Indian state," one can also read Kapur as demonstrating dissent within the elite coalition and more than a little divergence between the "interests and aspirations" of scientists in the elite and outside it. Is it really valid, or analytically helpful, to escape from this problem by positing "happy convergence" for the insiders and "ritual confrontation" for the outsiders (p. 18)? More generally, is convergence equally "happy" in the cases (both found in the book) of no dissenters existing and of the dissenters having no voice?

This surely cannot be the end of the analysis. Nevertheless, the editor has assembled a worthwhile book, with much of interest in it. The analytical framework is provocative, and the effort to move toward serious comparative analysis is commendable.

Philip J. Gummett
Program of Policy Research in Engineering, Science and Technology, University of Manchester, Manchester M13 9PL, UK

■

Vignettes: Explanatory Approaches

One makes a mess of the question "How does the heart pump blood?" by starting with facts about human social structures critical for food production sufficient to nourish functioning human hearts. But these are nonetheless factors in a complete explanation of the pumping of blood. Biological "systems" are simple only if their environments are not included in the description.

—*James R. Griesemer*, in *Are Genes Us? The Social Consequences of the New Genetics* (Carl F. Cranor, Ed.; Rutgers University Press)

A reversal of the differentiation of biology and sociology is as unlikely as the return of the Neanderthal. Both disciplinary discourses will continue to develop as separate interpretative resources that modern societies will draw on. The problem left is to account for the apparent cycles of attention experienced by biologistic explanations of social phenomena. Under which social conditions are biological explanations considered appealing, and which are typical for the prevalence of sociological explanations?

—*Peter Weingart*, in *Modernist Impulses in the Human Sciences, 1879-1930* (Dorothy Ross, Ed.; Johns Hopkins University Press)

Childhood Upheavals

"Daddy's Gone to War." The Second World War in the Lives of America's Children. WILLIAM M. TUTTLE, JR. Oxford University Press, New York, 1993. xvi, 365 pp. $30 or £25.

Every historical era is unique, but the World War II period can certainly lay claim to extraordinary differences. In America, millions of men and women left their homes and families to fight a war in distant countries. In addition, millions of families moved to strange, and often inhospitable, communities. They migrated to be near their loved ones who were in the service or to defense plants and the jobs made available by them. Our industrial heartland shifted from the manufacture of cars, stoves, refrigerators, and washing machines to the production of ships, planes, tanks, and guns. Last, but not least, millions of women, many of them mothers of young children, joined the work force.

In *Daddy's Gone to War*, William Tuttle attempts to capture the effects of these momentous transformations and dislocations upon the American children who were born before or during the war years. His prime database is letters, elicited by ads in hundreds of mainstream and minority newspapers around the country, in which readers who had lived through the war as children shared their stories. Some 2500 people responded and wrote movingly of their memories of the war and of its aftermath.

In a masterly way Tuttle has fashioned these reminiscences, together with a great deal of factual information about the war years (number of families who moved, housing, child-care, and recreational problems, racial upheavals, and so on) into a social history of this period. Although the focus is on how the war impacted upon children at different age levels, Tuttle also uses his material to illuminate the gender, racial, and religious prejudices and attitudes that were, in many ways, sharpened by the tension of war. It makes for fascinating reading, particularly for those readers, like myself, who also experienced the war as children.

Tuttle organizes his material in a roughly chronological order. The early chapters deal with the beginning of the war, the rapid induction of men and women into the service, and the housing, schooling, health, and recreational problems confronting the many families who migrated from their own communities to be near the training camps or the defense factories. Later chapters deal with the war years from the perspective of children and adolescents. Many writers recalled the air raid drills, the bond drives, and the efforts to collect and recycle scarce materials like the silver foil of cigarette packages. Other correspondents remembered the movies, the radio shows, and the comic books heavily freighted with war news and patriotic messages. The later chapters deal with the end of the war. Here we relive the joys and problems created when service men and women returned, after years of separation, to families that were accustomed to living without them and to whom they were almost complete strangers. Looking at all of these events through the eyes of childhood memory offers a fresh perspective on a war perhaps most familiar from its novelistic portrayals by the adults who fought it.

Of particular interest is the attention the author gives to the issues of gender bias and stereotyping and to the racial and religious bigotry that were also part of the consciousness of children and adolescents growing up during the war years. Children experienced these prejudices in their own ways. Girls, to illustrate, told of not being allowed to play soldier but only to take the role of nurses. Japanese Americans who had been interned as children recalled their struggles to understand why they were removed from their homes in California and shipped off to camps in the Midwest. Black and Jewish children revisited the fear and anger they felt as the targets of name-calling and vicious racial slurs. While gender bias and religious and racial and ethnic intolerance are always with us, these hateful sentiments were apparently exaggerated and magnified by the war. Perhaps the social permission to publicly hate an enemy gave license to other hatreds as well.

Though this book provides a powerful and engrossing social portrait of the World War II years, it cannot tell us anything about the lasting effects of these experiences upon children. First of all, it is not a scientific study. It would be impossible, for example, to find a control group with which to compare this population. A second problem is the letters themselves. Recall memory is extraordinarily fallible. We tend to recollect as our own experiences happenings that we heard about or read about. For example, one girl who was at Pearl Harbor on the morning of 7 December 1941 remembers the Japanese planes flying so low she could, from her second-story window, see the pilot's faces. Though that is possible, it seems highly unlikely. A more probable explanation is that she heard adults exaggerate their own accounts in this way and proceeded to reconstruct this as her own lived experience.

It is really impossible to determine to what extent the memories recounted in these letters are veridical and to what extent they are encrusted with non-experienced embellishments. Memory is not a video tape. The author, however, is silent on this issue of reconstructive memory. He seems to accept the stories told to him as valid accounts of young people's wartime experiences.

The problem seems to be that Tuttle has confounded historical and psychological methods of investigation. Though these approaches can be meaningfully integrated (as, for example, in the writings of Erik Erikson on Luther and Gandhi), the task requires a creative amalgam of historical and psychological methodologies and concepts. Although Tuttle attempts such an integration in the concluding chapters of the book, his effort is unsuccessful. In any case, this conceptual melding should have been done before, rather than after, the data collection.

Despite the implication of its subtitle, therefore, this book adds little to our knowledge of the lasting effects of wartime experiences, such as family uprooting and father absence, on the children who underwent them. Viewed as social history, however, rather than as psychological research, *Daddy's Gone to War* is a compelling work that illuminates some of the heretofore dark niches of the years of World War II. Indeed, after reading this book, the reader can't help wishing that there had been Tuttles to write comparable histories of the Civil War and Revolutionary War years.

David Elkind
Department of Child Study,
Tufts University,
Medford, MA 02155, USA

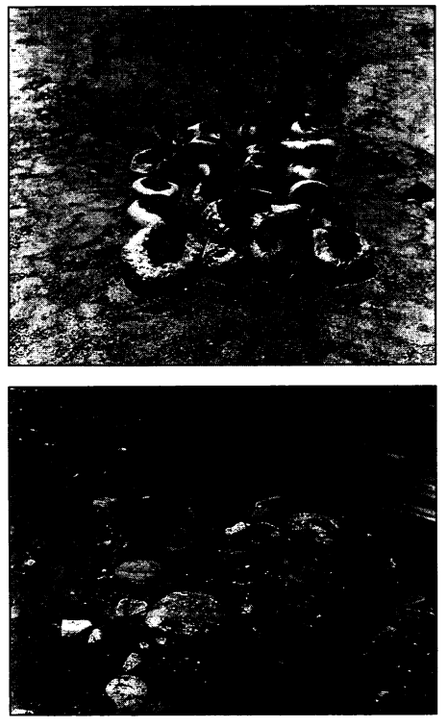
Fluvial Ways

A View of the River. LUNA B. LEOPOLD. Harvard University Press, Cambridge, MA, 1994. xiv, 298 pp., illus. $39.95 or £31.95.

Luna B. Leopold is responsible for perhaps the most important research on rivers over the past 50 years. In this very personal book he reflects upon that experience, providing insights that go far beyond mere research results. The narrative weaves the scientific discoveries of Leopold's long career with crisp descriptions of how those discoveries were achieved and sage comments on current and future directions for scientific inquiry. In the last regard it is reminiscent of that seminal work *Fluvial Processes in Geomorphology*, written by Leopold with M. Gordon Wolman and the late John P. Miller, which, though published 30 years ago, is still read with profit today.

There is an anecdote of Leopold's that conveys something about the scientific genius that emerges through *A View of the River*. One of Leopold's many important contributions involves the understanding of the successive deeps and shallows that one encounters along the course of natural river channels. Well known to fishing enthusiasts, deep pools of slow-moving water alternate at regular spacing with shallow riffle bars over which the river water moves more swiftly. Shortly after his classical work on this problem in the 1960s, Leopold met a Scottish river scientist, Tom Stuart. Asked about his work, Stuart replied, "I talk to fish." Stuart described how his work on salmon and trout behavior had revealed aspects of river flow at gravel bars that Leopold had not recognized in his own work. It is through such close attention to nature and an open mind for connections among seemingly unrelated phenomena, rather than in stuffy textbook analyses of river mechanics and sediment transport, that important discoveries are made.

If I were forced to name a more important fluvial geomorphologist than Leopold, only one obvious candidate comes to mind: Grove Karl Gilbert (1843–1918). Like Leopold, Gilbert advocated scientific writing that goes beyond mere exposition of results to contribute understanding of the real-world methods by which scientists are led to their conclusions. Too much modern writing on so-called "scientific" methodology is concerned with the logic of how scientific results are explained and justified rather than with the human endeavors, both in reasoning and practical action, by which they were achieved. In this regard, Gilbert was careful to distinguish between scientific investigators and theorists. It is an unfortunate trend in modern hydrology, bolstered by the increasing ease of computer simulation and by various metaphysical rationalizations, that theory has come to assume a kind of moral ascendancy. Though both Gilbert and Leopold are well known for their theoretical contributions, their central concerns are those of the investigator: inspiration from natural phenomena in their real-world settings, the invention of hypotheses to explain those phenomena, and the creative application of quantitative measurement to test them.



Top, Twenty-four "painted rocks of 6 sizes that were placed in a streambed near Santa Fe as part of an experiment to evaluate the effect of rock spacing on propensity to be moved by the flow." *Bottom*, "One of the rock groups after having been subjected to storm flow." [From *A View of the River*]

Gilbert asserted a hundred years ago, "The great investigator is primarily and preeminently the man who is rich in hypotheses." *A View of the River* contains a treasure of hypotheses. Moreover, the whole book is centered around one grand hypothesis that assumes a number of scientific forms. The author believes that "the enunciation of a general hypothesis of river action would be useful to both specialists and the public." He proposes that chance plays a major role in local changes of river form and action. Though physical laws apply, these do not determine some singular response. Rather, adjustments are made to a most probable form, arising from the processes of energy expenditure by the river. This adjustment is illustrated by detailed discussion of the