style or interest. The chapter on economics was drafted by the Secretariat owing to the death of O. Lange.

The second section stresses interdisciplinary aspects of social science, with four chapters devoted respectively to: the case for genuine "integration" by means of concerted search for "common mechanisms"; the implications of problem-focused research and its requisite conditions; mathematics as a methodological intersection between disciplines, and a repertoire of the mathematical methods and models especially useful for interdisciplinary inquiry; and the challenges inherent in cross-cultural, cross-societal, and cross-national research and the analysis of certain trends which, taken together, describe one way to internationalize the social sciences. These chapters range broadly, yet are thorough enough to highlight and analyze critical problems and issues, both intellectual and organizational. The final section consists of a single essay on science policy and the development of research organizations and funding patterns in a number of countries; an argument is made for rational public policies to give social research the kind of sustained, orderly support it requires, and a model for an effective, creative organization of problem-oriented capabilities is described.

No collective work of such purpose and of such complexity is invulnerable to criticism. Knowledgeable readers will undoubtedly find errors and omissions. And while the separate contributions are on the whole tightly knit, informative, and often provocative, one might wish for more cross-referencing (the index does not cut fine enough to fulfill this function adequately) and for more explicit stitching together of chapters and sections. For example, S. Friedman's excellent 18-page foreword might have been expanded and incorporated into the main text. However, viewed as a whole the volume is not a hodgepodge, nor is it superficial. Its dedication to interdisciplinary collaboration does not take the form of rhetoric or lip service to a cliché. Appraisals of needs and opportunities are informed and realistic. Clearly, those who brought this project to fruition pretend neither to comprehensiveness nor definitiveness.

What are the chances of substantial movement in the directions suggested by this volume? An answer depends in part on how one assesses the balance of forces working for and against (i) disciplinary divergence or interdisciplinary convergence and (ii) nationalization or internationalization of the social sciences. Although the present period is characterized in part by antirationalism and by loss of faith in the ability of men to solve problems through evidence and reason, the massive social changes we are experiencing may constitute a positive vector. Most critical problems are now global and interdependent. To the extent that mounting problems affect the health and stability of populations, as well as the ability of governments to respond effectively to complex demands, the range of opportunities for the social sciences ought to increase. The public commitment of Unesco to the goal of a global social science which is both objective and directly pertinent to the welfare of mankind, and which will eventually transcend the barriers—intellectual, social, and political—to the acquisition and utilization of reliable knowledge is therefore most timely.

However, the work under review should be regarded as the basis of an agenda for future action and a stimulus for what should become a continuing dialogue by the international community of scholars. For the aspirations, diagnoses, and recommendations set forth here will come to little unless a sustained attack on some very practical problems is carried out. First, improvements in communications are much needed, starting with inventories of working researchers and theorists that reveal their current interests by field or subject. Also needed are catalogs describing in detail large data pools, including how the data are stored, what classification scheme is used, and under what conditions they can be used. "Opportunity maps" identifying contiguous problems intersecting two or more disciplines and missing pieces in the social science jigsaw puzzle which are ripe for exploitation would be useful. Second, the increased mobility of human resources which is so critical to the formation of new configurations of activity and capabilities would seem to rest in part on the establishment of new, sanctioned incentives and new ways of absorbing career risks for those who might be motivated to redirect their talents. Third, codification of past experience with alternative organizational arrangements for producing, disseminating, and utilizing social science knowledge, and a systematic matching of types of intellectual missions and types of organizations, are long overdue. Fourth, the importance of time in the building of interdisciplinary subcultures, in more effective social interventions, and in the development of more adequate theories must be documented more convincingly if resources are to be reallocated. Fifth, if public understanding and support are essential, appropriate educational and political strategies must be devised to close an existing credibility gap and to enable social scientists to function as a legitimate, coherent constituency.

These brief examples simply suggest that if interdisciplinary research is to be enhanced, and if a global social science is to materialize, significant, long-standing situational constraints must be overcome.

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Dating Research

Radiocarbon Variations and Absolute Chronology. Proceedings of the 12th Nobel symposium, Uppsala, Aug. 1969. INGRID U. OLSSON, Ed. Almqvist and Wiksell, Stockholm, and Wiley Interscience, New York, 1971. 658 pp., illus., + loose plates.

Since the symposium of which this book is the proceedings was held the chronology of bristlecone pine tree rings used to calibrate radiocarbon dates has been extended to more than 8000 years. Yet the book gives the reader a good feeling for the trends in dating research, especially because a variety of major topics is covered. These include radiocarbon and archeology, pottery analyses, radiocarbon and varve chronology, radiocarbon and dendrochronology, ice core analyses, exchange rates and radiocarbon in different reservoirs, radiogenic isotopes in the atmosphere and in meteorites, and causes of secular variations in $^{14}C/^{12}C$. Clearly, therefore, the proceedings contain also valuable contributions not directly in the mainstream of radiocarbon dating research but nevertheless closely related.

With respect to radiocarbon dates for historically well-dated Egyptian samples, an analysis more comprehensive than that included in the Nobel volume was presented by the reviewer at a later symposium organized by the Royal Society and the British Acad-

emy. (The proceedings have been published as *The Impact of the Natural Sciences on Archeology*, T. E. Allibone, Ed., Oxford University Press, 1970.) From both that and the Nobel study radiocarbon dates for materials from the best and oldest historically determined chronology in the world appear to be somewhat too early when the bristlecone pine calibration is applied as used today. However, these studies should find important use in assessing the absolute chronology of the Neolithic. Another study of the accuracy of radiocarbon dating that is not included in the Nobel symposium has an important bearing on the matter of short-cycle variations in the production rate of the isotope (*Scientific Methods in Medieval Archeology*, R. Berger, Ed., University of California Press, 1970). Checks from both Egyptian antiquity and the Middle Ages, utilizing materials of known age, confirm the existence of short-cycle variations as well as a major long-term trend in radiocarbon production. These are thought to be caused by heliomagnetic and geomagnetic effects respectively.

It is suggested in the Nobel symposium that, since varves reach farther back in time than bristlecone pine tree rings, the organic content of these deposits may be used as a cross-check to extend tree-ring calibration. Inherently organic materials washed into a lake from surrounding soils must have an age of their own, however. At this point there is insufficient experience available to indicate whether the error introduced by such materials can be neglected.

The proceedings of the Nobel symposium point up a major trend in radiocarbon research directed toward climatic studies of the past. Obviously the full potential of radiocarbon in such studies has not been reached. Radiocarbon offers a unique advantage here in that the variations observed are not large enough to endanger accurate time measurement and yet are sufficiently pronounced to permit valuable environmental studies.

The book reviewed here belongs in the context of the two others cited, which jointly describe the present state of the art. The trilogy should be indispensable to the modern archeologist, ecologist, geochemist, geophysicist, and radiochronologist.

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Physiological Adaptation

Hormones and the Environment. Proceedings of a symposium, Sheffield, England, Sept. 1969. G. K. BENSON and J. G. PHILLIPS, Eds. Cambridge University Press, New York, 1970. xvi, 630 pp. + plates. $22.50. Memoirs of the Society for Endocrinology, No. 18.

At a time when the study of environmental influences on life has become the vogue, this volume attempts to delineate the role of hormones in adaptation. Some of the original intent seems to have been lost sight of in the attempt, however. Also, some of the contributors have overlooked significant, if meager, information on mammalian species in preference to more abundant information in inframammalian groups. This reflects partially our lack of knowledge and the complexity of events in mammalian adaptive mechanisms. Regrettably, environmental influences affecting hormonal systems by way of psychobehavioral phenomena are generally ignored by the contributors. Missing also are significant data on *Homo sapiens*, his daily confrontation with various stimuli and stressors, including combat and aerospace travel, and the manner in which he effects hormonal adjustment and psychoendocrine adaptation. Additionally, several topics relating to the detecting and filtering systems for external stimulation and the internal adaptive integration are treated superficially although these systems constitute the central mechanism of environmental-hormonal interaction.

The book should be invaluable as a reference collection of experimental work on the role of hormones in environmental adaptation. Most of the authors have provided comprehensive compilations of the material most pertinent to their topics. The section on the aquatic environment provides a uniform and comprehensive coverage of a topic concerning which data have been available in abundance for a number of years. This is true also of the sections on the integument in the terrestrial environment and temporal changes in endocrine secretions. The other sections are distinctive not by the information which they present but rather by that which they do not. Most of the chapters in these sections are excellent in their coverage of such data as are available, however. In the section on neuroendocrine mediation, the presentations on the pineal and on neuroendocrine control of water metabolism are outstanding. The chapter on aging included in the section on the biotic environment is, possibly, the one discussion in the entire book that brings to mind our vast lack of knowledge. Its coverage of this process, which afflicts all humans but for which research has been slow in accretion, is truly comprehensive and up to date.

Occasionally, the reader will be perplexed in that the implications of the book's title are not reinforced by its content. In the words of H. A. Bern, who summarizes the proceedings, "there are some papers devoid of hormones and other papers devoid of the environment." However, it should be clear to the professional reader that this impression could have been avoided had additional scientists who have conducted research on environmental influences on the endocrine system been invited to contribute. The underlying problem of this volume is that the topic it attempts to cover is too broad and general. Perhaps more justice could have been done to several topics had the symposium restricted itself to only a part of the environment and the associated hormonal interactions.

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Data from Prehistory

The First European Agriculture. A Study of the Osteological and Botanical Evidence until 2000 B.C. JACQUELINE MURRAY. Edinburgh University Press, Edinburgh, and Aldine, Chicago, 1971. viii, 380 pp., illus. $10.75.

Since the end of World War II there has been an increasing emphasis in archeology on the collaboration of various specialists with the excavator, so that the data from geology, palynology, botany, and zoology may augment the interpretation of more conventionally "cultural" remains. One need only compare the compilation of data on faunal and floral remains in this volume with that in Grahame Clark's *Prehistoric Europe: The Economic Basis* (1952) to see how the study of prehistory has expanded its horizons. The author has made a synopsis of information from over a thousand excavations in Europe, including Russian material unavailable outside the Soviet Union. Such a compilation is of course valuable to the prehistorian interested in the develop-