
Arthur S. Iberall

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This is human history in overview, as depicted at the terminus *ad quem* of the second millennium, according to the Gregorian calendar.

UNESCO is to be commended for its decision, in 1947, to provide an internationally cooperative History of Mankind from its scientific and cultural perspective. That first edition appeared in six volumes from 1965 to 1970 with the contribution of seventeen authors. In 1978, UNESCO decided that the work should be revised. The task was undertaken by a Second International Commission for such a series. The new version involves 49 authors, a generation apart from the earlier group. Thus this first volume, not simply a revision but a radical recasting, leads off with that task.

The series as a whole is arranged in the following chronological order:

Vol. 1. Prehistory and the beginning of civilization.
Vol. 2. From the third millennium to the seventh century B.C.
Vol. 3. From the seventh century B.C. to the seventh century A.D.
Vol. 4. From the seventh to the sixteenth century.
Vol. 5. From the sixteenth to the eighteenth century.
Vol. 6. The nineteenth century.
Vol. 7. The twentieth century.

In all, seventeen very expert editors and 34 coeditors are listed for the various volumes. They are internationally distributed. The modern reader, whether amateur, generalist, historical specialist, or user is fortunate, in current times, to have such marvelous multiauthored overviews by a large number of knowledgeable people each writing from extensive backgrounds.

A foreword by a former president of the International
Commission outlines the total effort and that of each of its volumes. The chief editor provides an introduction and an afterword to the first volume. In the introduction, the concept of prehistory for hominids is put forth, its historical development as a study is briefly developed, and the tool subjects of supporting disciplines are discussed. In the afterword, of nine pages, the editor outlines what has been covered—from hominid toolmaking 2-2.5 Mya (million years ago) to city-states 5,000 ya (years ago), and in the last three pages he discusses the late Paleolithic through Neolithic findings. In his last comments, he 'sums' up, as introduction for the books to come, his emergent thesis that 8,000 years separates the first villages from the first civilized states and that there is then another 5,000 years that separate those first city-states from us now.

Part I of the book presents history from species evolution among hominoids to the beginnings of food production; the transformation from primates to hominids; Homo habilis and Homo erectus; nine small sections on Homo sapiens neanderthalensis; and eighteen small sections on the period of Homo sapiens sapiens—modern humans; then it ends with discussion pertaining to the beginning of food production. Part II, following, presents an overview story and history from the beginnings of food production to the first states, domestication of plants and animals, and then about 21 short views of prehistory around the world.

The keynote for civilizational study that emerges from this remarkable summary of archaeological findings as they are now known is the growing maturation of our understanding of the changing dynamics of ourselves. This is clearly exhibited in Mellaart's superb summary of the findings from Western Asia. He tells the up-to-date story of the long transition from Aurignacian hunter-gatherer to the beginning of a first urban civilization, 30 years after his first such summary in Earliest Civilizations of the Near East, 1965.

I quote from Mellaart's first few paragraphs (p. 425): "Archaeological discoveries over the last forty years in western Asian and adjacent regions have greatly altered the conventional picture of primary and secondary centers, the role of cultural diffusion from the former and the vexed question of the rise of civilization.... By extending the archaeological range far beyond the
threshold of civilization, conventionally placed about 5,000 and up to around 12,000 years ago, we are now able to see cultural development in all its diversity during the previous seven millen-nia [i.e., branching from the Aurignacian] ... in all the other territories which form a cultural continuum.

"Co-operation with scientists, be they zoologists, botanists or physicists, has greatly benefitted archaeology in [its] search for the origins of farming and animal domestication ... and an absolute chronology .... The new time scale is something no archaeologist can now afford to ignore.

"The impact of some forty years of discovery, much of it not yet fully published or digested, on archaeological theory as established in the 1920s to 1940s has shattered most of its foundations. Many archaeologists have not yet come to terms with the new evidence and continue to fight rearguard actions to save their cherished theories. Others, more forward looking, maintain that the new evidence demands a new interpretation, based on facts rather than on outmoded and discredited ideas formulated at a time when little was known and much was therefore assumed. The present author prefers to base himself on evidence."

Ergo, this particular section author (Mellaart) proposes to take you on the trip from hunter-gatherer to urban civilizationist as a superb fact distiller and unifier. So do most of the other authors and section editors. The particular challenge that he offers the reader is to provide a new interpretation of that corpus of new facts as they have emerged.

Our physically oriented research group in the social sciences, though in part amateurs in civilization studies (although some of us have been attending and contributing to this society since 1972), have studied the problem of a general approach toward complex systems, called homeokinetics, a set of common physical principles and strategies for the study of complex systems of all kinds, be they physical, chemical, biological, ecological, or social. Of particular concern to us here is the geographical space, the dynamic timing of events and processes, matter, and energy, and the character of the human individual, group, and societal action that did and will occur. It is interesting for me to note that I was able to test our first piece of physical theory for a civilizational condensation of people by the use of Mellaart's 1965 book.
More broadly put, our major theoretical responses in considering the social sciences were contained in an early attempt to bridge the gap between science and Toynbee's modelling after the first ISCSC meeting, held in DC to honor Toynbee. Our topic was "On a Thermodynamics of History." A second effort (b) was made, upon invitation to create a foundation for social mechanics study, in a chapter written with my colleagues, Soodak, as a second physicist, and with what was supposed to be two social scientists—Conrad Arenberg, a well known anthropologist plus a fourth author, the sociologist, Harold Lasswell who died just when we had gotten into the work. Our chapter was entitled, "Homeokinetics of Society—a New Discipline," in a book, Perspectives in Biomechanics. To add just one more reference to our pertinent work, there is our 'experimental' paper, Chapter 6, testing our physical hypotheses in Iberall, White, Wilkinson, Foundations for Social and Biological Evolution, 1993, which attempts to perform the two halves of what Mellaart calls for. If UNESCO gives you the factual story as of 1994 or so directly from the archaeological experts, Foundations gives you—building on the facts hard won by those experts during the past 70 or so years—a depiction of a new scientific interpretation.

Returning, more appropriately, to all others in the field of human social study, I would also like to state—as a physical generalist—that no one should really feel prepared to start in on becoming detailedly involved in more specific human individual, group, or civilizational studies without having tasted to the full: G. Barraclough (ed.). The Times Atlas of World History (any of its editions from 1984 on); UNESCO Series, History of Mankind, 6 vols., 1965-1970; A. Sherratt (ed.) The Cambridge Encyclopedia of Archaeology, 1980; or the current seven volume UNESCO series, 1994 on. And likely, in comparison, as a two brain halves experience, Chapters 5 and 6 from our 1993 monograph.

What is notable about these books is the width and depth of interdisciplinary subject matter and coverage that is now available as a foundation for such a field of study—a history of humankind. One cannot yet say that such historical study has reached the status of a hard science, but it is clear that the disciplines are beginning to converge on a correlated understanding of the complex system that they try to tackle. Modest differences in
factual detail, in innumerable controversies that still exist, in
detailed up-to-the-minute reporting is hardly of any significant
relevance in the amount of intellectual support that each of the
conflicts or differences give to each other. This remark empha-
sizes that such study is on the verge of becoming a quantitative
science, but is not quite yet.

Let us probe additionally at this particular point that both
Mellaart (Chapter 41) and our colleagues make, that palaeoan-
thropology, anthropology, and social physics continue to move
toward—but have not yet fully achieved—hard science status
one finds that the carefully crafted hedge of the past 30 or so years
(see Villa, Chapter 4, on big game hunting during the middle
Pleistocene) that humans were more scavenger-gatherers, only
occasional hunters, rather than competent hunter-gatherers, came
apart in 1997 with the discovery of 3 skillfully crafted hunting
spears from 400 kya in mid-Europe (Nature, Feb. 27, 1997 -
Thieme), thus exhibiting comparable technological big game
hunting capability for Homo(erectus, early sapiens) over the
hominid period 400-100 kya. These social and biological evolu-
tionary problems are good problems which join experiment and
theory in the construction of a social physics to be. You have to
risk a lot in both theory and practice in a real science. You can't
sneak in or on myths.

Or, to put a fine point on it: what one finds throughout the
book is the growing maturation of what was involved in the
changing dynamic history of ourselves. The student of civiliza-
tion and of civilizational studies, of necessity, must hold all of the
detailed meistertstück within his/her memory banks but still with
considerable flexibility.

One other small example will be given to illustrate the com-
mon problem that detailing involves. It is still the main impedi-
ment for this general field of humankind study to be considered
yet a hard science. The one single illustration that is discussed
here is being used for no detailed purpose except to show some-
thing of the character of missing hard theory. It is contained in
the question of humanity's entrance into the Americas. Chapter
29, Map 27 proposes to locate the oldest archaeological sites
which are attributed to the Americas. It provides numbers from
greater than 40 kya at the most northerly sites to about 11 kya for
the most southerly sites. Can that broad range be justified? What stands behind that description is the question of human diffusion around the Earth and how the Earth's surface became occupied. There are those who believe in entry dates as early or earlier than 35 kya and there are those who believe in dates no earlier than say 15 kya. It is well known that Paul Martin has strenuously led the fight for a dating of human entry into the Americas associated with findings not a lot older than the Clovis tool period, e.g., 14 to 10 kya (see, for example, P. S. Martin, The discovery of America, Science, 179, 969, 1973). However, the controversy is more broadly exposed in M. Coe, D. Snow, E. Benson, Atlas of Ancient America, New York: Facts on File, Inc., 1986. That discussion is more illuminating than the one in the book under review.

The only tentative resolution, as offered in Iberall et al., has been to assume, from some plausible physical principles, that there were a number of independent diffusions into the continent and that the one that "took," namely arrived at the southern tip at about 11,000 ya, having crossed over the Bering Strait land bridge at perhaps 17-15 kya. Thus how many other of the findings of earlier dates are/were true, we would tend to believe, is still not yet known. At the present time, the Monte Verde finding of about 12-13 kya is perhaps gaining a legitimate acceptance as added support for the southernmost findings. One final reference which has similar flavor to what we find acceptable is L. Cavalli-Sforza, P. Pennozi, A. Piazza, The History and Geography of Human Genes, Princeton: Princeton U. Press, 1994, Chapter 6.

While intellectual issues may be resolved in more than one way, and even in physics we require a few shots before we get it right, our 'hard' physically based social science started with an estimate for the diffusion process, from biophysical principles, for the diffusion rate of the human on Earth. It led us to the estimate of one mile per year scaling speed. We found confirmation for that rate in van Doren Stern's book on Prehistoric Europe where he states that the diffusion of population, of pottery, of metallurgy, of agriculture (the latter verified by Cavalli-Sforza) was at about the rate of 1-1 1/2 miles per year. Add that to knowledge that the circumference of the Earth is 25,000 miles, one grasps that the time scale for the human species' diffusion from Africa...
into Eurasia, or more particularly the diffusive spread of Homo erectus across Eurasia, leads to a time table at which the gatekeeping entrance into the Americas, as a one time entrance and take over, is keyed by the Bering Strait bridge and the time of arrival of the species over the entire Siberian range. Once you have one, two, a few such gated diffusions, one of them will take. That is part of the detailed physics of stability transitions and other so-called transport processes. You may wish to think that you are free to wander the landscape of history in seeking out such explanations, that there are many ways to skin cats. The physical sciences limit you to only a number of processes whose relative stability you have to assess, and that is the bridge we have to offer.

P.S. We love this book. It brings us to the sense of a beginning of civilization, e.g., in the Near East right to the time period and processes that one finds between the late Natufian and the Halafian, with agricultural and pastoral beginnings back to the Kebaran. This is our modelling contribution to Mellaart's and the entire UNESCO book of facts.

Arthur S. Iberall

SOVIET CONTRIBUTIONS TO MESOPOTAMIAN CIVILIZATION STUDIES


A Soviet archaeological expedition (Archaeological Institute in Moscow of the USSR Academy of Science) spent twelve seasons from 1969 to 1980 exploring a group of prehistoric mounds in northern Iraq on the Sinjar Plain, which lies between the Tigris and Euphrates Rivers. The region is west of Tepe Gawra and