principle or in practice? Regrettably, neither author tackles this issue.

Fukuyama, a political economist at Johns Hopkins University's School of Advanced International Studies, approaches the ethics of genetic engineering from a different standpoint than Stock. He focuses on three issues: the right of a human to be human; the dignity of a human, which would be lessened by deliberate genetic manipulation; and the preservation of human nature. In contrast to Fukuyama's reliance on rights, dignity, and human nature, Stock builds his case using a variant of utilitarianism (often called acceptability ethics) that identifies the greatest good as that which is accepted by most of the people.

Human rights constitute a key element in contemporary moral discourse. In his book, Fukuyama generally discusses them in terms of how the allocation of rights is reflected in modern politics. He believes that his position is helped by a long-winded denunciation of the naturalistic fallacy (the argument "that nature cannot provide a philosophically justifiable basis for rights, morality, or ethics"). Fukuyama virtually ignores the corresponding duties that necessarily pertain to the expression of rights. If we turn to the history of chartered rights, we find they began with the Magna Carta of 1215 (which represents a hard-fought deal between the king of England and his barons) and the Bill of Rights of 1689 (a contract imparting mutual benefit to the incoming royals, William and Mary, and the English parliament). The history indicates that humans do not have rights "as of right," rather they engage in a contract whereby they agree to behave in a particular way so that they may enjoy certain privileges.

Dignity, too, is not a fixed parameter. Although various declarations assert the essential equality of all humans, it is obvious that this can only represent a statement of how humans are to be treated before the law. Fukuyama and others also hold that humans differ qualitatively from the animals from which we evolved and that this qualitative difference is the font of human dignity. But animals, too, are qualitatively different from one another without assignations of dignity.

Human nature stems from the expression of the genes as affected by their environment. Our genetics somehow defines our emotions—the human feature that Fukuyama wants to preserve. He claims that changing the emotional characteristics of existing humans would lead to changes in human values, and he cites the values that he would not wish to alter as compassion, caring, love, and the sense of equality. He also argues that by engaging in genetic enhancements we sacrifice freedoms, promote competition, and accentuate hierarchy. Hence, there is a need for more regulation. In the United States, agencies such as the Food and Drug Administration must be set to curtail and prevent research work that might lead to successful and safe techniques being developed to engineer animals and subsequently humans.

Notwithstanding the proscriptive legislation relating to human cloning and gametic genetic engineering of humans that has recently appeared on statute books of many liberal democratic countries and international bodies, Stock holds that such legislation will eventually be voided. China and other countries that do not have much truck with such liberal attitudes, are likely to use these techniques as soon as they become practicable. Although the West had its fingers badly burned by the eugenic practices of the Nazis, Stock believes that market forces and public pressure by parents wishing to improve the quality and performance of their children will demand genetic enhancement. And he predicts that if such services are denied, people will seek them abroad, as happens presently for treatments that are outlawed in the home country.

It is right to be concerned with how we might apply the new biotechnological tools to enhance human lives. With these books, Stock and Fukuyama each seek to lead our societies in the ways we might respond. But we live in a variegated world, and readers can be assured that diverse countries and peoples will react differently to the challenges ahead. I would applaud this differentiated response as it provides clues from which we may be able to guess what it is we are about to become.

BOOKS: ANTHROPOLOGY

At the Dawn of Tyranny

Elizabeth Carter

Mesopotamia has long served as a model case for understanding the origins of cities and states. Fieldwork in southern Iraq by Robert McC. Adams, which began in 1957, led to mapping the ancient settlements on the plains created by the Tigris and Euphrates rivers. Adams's *The Evolution of Urban Society* (Aldine, Chicago, 1966) set the agenda for contemporary research into early urbanism in the region. *Uruk Mesopotamia & Its Neighbors*, edited by Mitchell Rothman, pays tribute to that pioneering work with 15 articles that build on Adams's data and his rich intellectual legacy.

The author is in the Department of Near Eastern Languages and Cultures, 376 Kinsey Hall, University of California, Los Angeles, CA 90095, USA. E-mail: carter@humnet.ucla.edu

Nonspecialists will find Henry Wright's essay, "Cultural Action in the Uruk World," the most accessible chapter in the book. Wright places the early Mesopotamian world of the fourth millennium B.C. and its capital city, Uruk-Warka, in historical perspective. He reminds the reader that "at the dawn of tyranny, the critical dynamic is that between would-be rulers and those whom they sought to dominate."

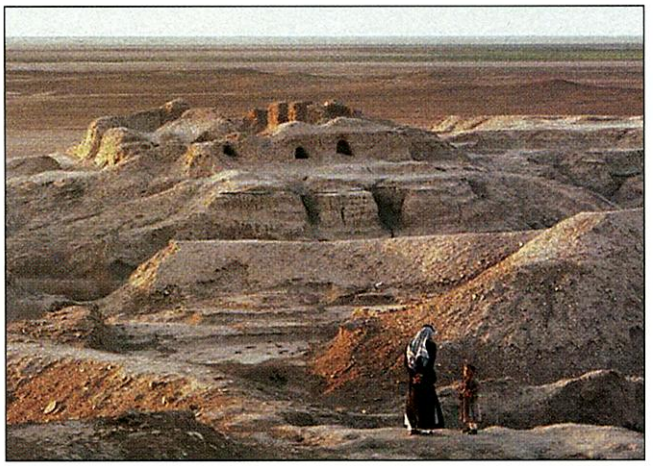
Susan Pollock uses a reanalysis of data from Adams's archaeological survey to challenge earlier conclusions that shared material culture equals political coalition. At the time, the Mesopotamian heartland was by no means a unified entity. Pollock identifies a relatively stable region in the northern alluvial plains, which was characterized by competing polities of comparable extent and scale. In the south, a larger and less stable polity was centered at the site of Uruk-Warka.

Uruk Mesopotamia & Its Neighbors Cross-Cultural Interactions in the Era of State Formation
Mitchell S. Rothman, Ed.
School of American Research Press, Santa Fe, NM, 2001. 578 pp. $60. ISBN 1-930618-02-6. Paper, $24.95. ISBN 1-930618-03-4. James Currey, Oxford, 2002. £45. ISBN 0-85255-461-3. Paper, £16.95. ISBN 0-85255-460-5.

All of the contributors comment on the spread of Uruk material culture and establishment of the new settlements to the north and east of southern Mesopotamia during the fourth millennium. Was it accidental that the dispersal of material culture and possibly settlers coincided with the birth of cities and the origin of the state in ancient Sumer? In Pollock's interpretation, Uruk settlements (sites that have yielded Uruk-style artifacts) outside the Mesopotamian heartland were settled by the displaced and disaffected from the repressive Uruk state in the south.

Gil Stein's analysis of the site of Hacinebi, some 1000 km north of Uruk on the Euphrates, suggests that "Mesopotamians lived there as an economically autonomous diaspora community." He attributes the symmetrical nature of political and economic relations between the immigrant and native communities to the inability of the Uruk folk to control the locals at such a great distance from the Uruk center. But Stein does not explain why the local people, with their already relatively complex society, let the foreigners settle amidst their town in the first place.

For Guillermo Algaze the answer is clear: both parties benefited, at least at the beginning of the process. Eventually, cross-fertilization spurred the growth of local societies so that they became competitors, not partners. The Mesopotamian elites were able to convert their surplus



Foundations of cities and states. Uruk-Warka emerged as the preeminent demographic center of southern Mesopotamia during the second half of the fourth millennium.

agricultural production into woods, metals, and stones from the Zagros and Taurus ranges. These materials were shipped south through a series of strategically located emplacements along the main riverine and overland trade routes. The profits of long-distance trade are visible in the archaeological record. The Mesopotamian polities built monumental public buildings and furnished them luxuriously. Their reinvestment reinforced the political control of the elites, whose access to distant lands and exotic commodities augmented their internal prestige. For Algaze, technological superiority in record-keeping, transport, and politics are indicators of a successful "informal economic empire."

Algaze had previously, in his book *The Uruk World System* (University of Chicago Press, 1993), seen the Uruk period as a "cultural explosion." Wright and E. S. A. Rupley now present a chronology, based on recalibrated carbon-14 dates, that indicates the Uruk period lasted a minimum of 700 to 800 years. What formerly appeared as a short-lived episode of internal growth with subsequent expansion and domination is now recognized as a much longer and far more intricate relation between highlands and lowlands.

In Hans Nissen's description, Uruk-Warka at the time Mesopotamian civilization first emerged was a walled city of 20,000 people with an impressive skyline of public buildings visible from afar on the flat Mesopotamian plain. Nissen points out that Uruk-Warka was at the apex of a local settlement hierarchy, but that there were no doubt similar developments at other Mesopotamian cities—such as Kish, Nippur, Umma, Girsu (Telloh), and Ur—if only we knew more about the deeply buried layers at those locales.

Holly Pittman traces the long history of the use of seal-impressed clay masses in different parts of Greater Mesopotamia. In the highland portions of the ancient Near East (now within Iran and Turkey), stamps—not the Mesopotamian cylinder seals—were used before, during, and after the Uruk Period. Pittman shows that in these areas the changes in the "administrative tool kit and the symbolic technology" that took place in the south in the context of the newly urbanized state societies occur only where there is additional clear evidence for the presence of southern influence.

The early Mesopotamians exported their religious and symbolic systems and, of course, their writing. But was their "cultural capital" an expression of political dominance? Was it an attempt by the diaspora to keep their traditions alive? Or both? The issue remains unresolved because none of the authors investigate the assimilation or acculturation of the transplanted Mesopotamian population in Syro-Anatolia. Similarly, none examine the cultural innovations of the highlands that were adopted and adapted in the Mesopotamian heartland. These shortcomings point clearly to avenues for future research, but they do not detract from the value of the volume. *Uruk Mesopotamia & Its Neighbors* offers readers important new data and compelling interpretations of the era of state formation in Greater Mesopotamia.

BROWSINGS

The Future of Spacetime. *Stephen W. Hawking, Kip S. Thorne, Igor Novikov, Timothy Ferris, Alan Lightman.* Norton, New York, 2002. 220 pp. $25.95, C$37.99. ISBN 0-393-02022-3.

This eclectic collection of essays for the general public was adapted from talks given at Caltech during a June 2000 celebration in honor of Thorne. Three pieces discuss the physics of black holes, gravitational waves, and time travel; Ferris comments on the popularization of science; and Lightman compares working in theoretical physics and writing fiction.

Things Come to Life. Spontaneous Generation Revisited. *Henry Harris.* Oxford University Press, Oxford, 2002. 178 pp. $34.95, £20. ISBN 0-19-851538-3.

The idea that living organisms can arise from inanimate matter by natural processes that do not involve divine intervention was first subjected to experimental tests in the 17th century. After initial experiments gave conflicting results, improved methods led to the decline of support for the theory and its final collapse at the end of the 19th century. In this concise account, Harris does not ignore the social, philosophical, and religious contexts of the often acrimonious debates, but his focus is on the value of the experimental evidence. A brief epilogue considers the difference between the questions of spontaneous generation and the origin of life.

Lives of a Biologist. Adventures in a Century of Extraordinary Science. *John Tyler Bonner.* Harvard University Press, Cambridge, MA, 2002. 229 pp. $24.95, £16.95, €28.70. ISBN 0-674-00763-8.

Bonner's early work with cellular slime molds (social amoebae) led him to appreciate the importance of life cycles. Over the course of his long career, he has concluded that considering organisms as life cycles offers a productive means of linking all of biology: development, genetics, evolution, physiology, ecology, and behavior. In this informative blend of memoir, history, and biology, Bonner offers readers a charming account of his own life cycle and of the development of 20th-century biology.

It Must Be Beautiful. Great Equations of Modern Science. *Graham Farmelo, Ed.* Granta, London, 2002. 270 pp. $25, £20. ISBN 1-86207-479-8.

Equations, even when actually wrong, form the indispensable core of many scientific theories. Each author in this book offers the nonmathematical reader an informative account of the development, power, and influence of an important equation of 20th-century science. Their essays include examples from physics, information theory, ecology, evolution, astrobiology, and atmospheric chemistry. The topics range from the Planck-Einstein expression for the energy of a quantum to the Molina-Rowland equations, which tie chlorofluorocarbons to the destruction of ozone.

Calculated Risks. How to Know When Numbers Deceive You. *Gerd Gigerenzer.* Simon & Schuster, New York, 2002. 320 pp. $25, C$38. ISBN 0-7432-0556-1.

Using a series of examples that range from screening for breast cancer to predicting violent behavior, Gigerenzer offers general readers a crash course in understanding uncertainty. He argues that considering outcomes in more easily understood representations, such as "absolute risks," provides a means of overcoming innumeracy and people's lack of training in statistical thinking.

CREDIT: NIK WHEELER/CORBIS