The Case for "Big History"*

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WHAT is the scale on which history should be studied? The establishment of the *Journal of World History* already implies a radical answer to that question: in geographical terms, the appropriate scale may be the whole of the world. In this paper, I will defend an equally radical answer to the temporal aspect of the same question: what is the time scale on which history should be studied? I will argue that the appropriate time scale for the study of history may be the whole of time. In other words, historians should be prepared to explore the past on many different time scales up to that of the universe itself—a scale of between 10 and 20 billion years.[1] This is what I mean by "big history." Readers of this journal will already be familiar with the case for world history. I will argue that a similar case can be made for teaching and writing about the past on these even larger time scales.

As I understand it, the case for world history turns to a large extent on the belief of many historians that the discipline of history has failed to find an adequate balance between the opposing demands of detail and generality. In the century since Ranke, historians have devoted themselves with great energy and great success to the task of documenting the past. And they have accumulated a vast amount of information about the history of a number of modern societies, in particular those with European or Mediterranean roots. But in history, as in any other academic disci-

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[1] This according to Big Bang cosmology, the dominant paradigm of modern astronomy and cosmology.

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pline, you must look beyond the details if you are to understand their meaning, to see how they fit together. We need large-scale maps if we are to see each part of our subject in its context. Unfortunately, historians have become so absorbed in detailed research that they have tended to neglect the job of building these larger-scale maps of the past. Indeed, many historians deliberately neglect the task of generalization in the belief that the facts will eventually speak for themselves when enough of them have been accumulated, forgetting that it is we alone who can give the "facts" a voice. The result of this one-sided approach to historical research is a discipline that has plenty of information but a fragmented and parochial vision of its field of inquiry. Not surprisingly, it has become harder and harder to explain to those we teach and those we write for why they should bother to study history at all.

World history is, among other things, an attempt to redress this balance. The point is expressed well by David Sweet in a recent discussion of efforts to organize graduate study in world history:

> Perhaps the best argument for a program in world history is that it represents a long-overdue recognition by members of our profession that in the end history is all of one piece—that it is the whole story of humanity, seen in the context of humanity's changing relationship to nature. This includes an acknowledgment that all parts of that story are of importance to the whole, and that they have full meaning only when seen somehow in relation to the whole.[2]

Arguments of this kind will be familiar to readers of the *Journal of World History*. But the arguments that apply to world history are also true at larger scales. We cannot fully understand the past few millennia without understanding the far longer period of time in which all members of our own species lived as gatherers and hunters, and without understanding the changes that led to the emergence of the earliest agrarian communities and the first urban civilizations. Paleolithic society, in its turn, cannot be fully understood without some idea of the evolution of our own species over several million years. That however requires some grasp of the history of life on earth, and so on. Such arguments may seem to lead us to an endless regress, but it is now clear that they do

[2] David Sweet, *World History Bulletin* 5, no. 2, (1988): 7.

not. According to modern Big Bang cosmology, the universe itself has a history, with a clear and identifiable beginning somewhere between 10 and 20 billion years ago. We can say nothing of what happened before this time; indeed time itself was created in the Big Bang. So this time scale is different from others. If there is an absolute framework lor the study of the past, this is it. If the past can be studied whole, this is the scale within which to do it.

By "big history," then, I mean the exploration of the past on all these different scales, up to the scale of the universe itself. In what follows I will first discuss some possible objections to big history; then I will describe in general terms, and with some specific examples, some ot its merits; and finally I will describe a university course in big history as an illustration of some of the practicalities of teaching history on this largest of all possible scales.

Some Objections to Big History

If the idea of big history seems strange at first sight, that is largely because it breaches in an even more spectacular way than world history a number of well-established conventions about the ways in which history is best taught and written. To explore the past on a very large scale means going beyond conventional ideas about the time scales on which history is best studied, and it means transgressing the traditional boundaries between the discipline of history and other disciplines, such as prehistory, biology, geology, and cosmology. Can these conventions about time scales and discipline boundaries be breached with impunity? For my own part, I am sure that they can; I believe that they are indeed little more than conventions and that breaching them can only be healthy.

To take first the issue of time scales. Although there are a number of outstanding exceptions (several of whom have played an active role in the establishment of the World History Association), the vast majority of professional historians continue to explore the past on the lime scale of a human lifetime. Most courses tend to be taught, and most books tend to be written, on time scales from a decade or two to a century or so. Two similar, but opposite, objections are often raised against those who attempt to survey the past on larger scales. One is that large-scale history means sacrificing detail and retreating into empty generalities; the opposite objection is that at the large scale there is simply too much information for the historian to handle.

The same reply can be made to both objections: the very notion of detail is relative. What is central at one scale may be detail at another and may vanish entirely at the very largest scales. Some questions require the telephoto lens; others require the wide-angle lens. And as one shifts from smaller to larger scales, the loss of detail is, in any case, balanced by the fact that larger objects come into view, objects so large that they cannot be seen whole from close up. So there is no single appropriate level of "graininess" for the historian; nor is there any reason to regard the conventional lime scales as sacrosanct. The amount of detail required depends purely on the nature of the question being asked.

This principle applies to all time scales. If the questions being asked concern the origins of human society or the human impact on the environment, then clearly we must be prepared to view the past on a scale of many millions of years.[3] If our questions concern the significance of intelligence or of life in the universe, they require an even larger scale. All that is required to pursue such questions is a willingness to shift lenses in a way that is familiar in principle to all historians, even if its application on so heroic a scale may induce a degree of vertigo the first time around. No difficulty of principle is involved, although the shaking of such well-established conventions does require a considerable effort both of the imagination and the intellect.

This leads to a second criticism of large-scale history, one that concerns expertise. In tackling questions on these huge scales, the historian is bound to breach conventional discipline boundaries as well as conventional time scales. Can historians legitimately stray like this beyond their patch? Clearly, no single scholar can acquire an expert's knowledge in all the different disciplines that have a bearing on history at the very large scale. But this does not mean that the historian should abandon such questions. If a question requires some knowledge of biology or geology, then so be it. All that is required is a willingness to exploit the division of intellectual labor that exists in all our universities. Far from being unusual, this is normal procedure in any science; indeed it is normal procedure within and among the many subdisciplines that make up history. Besides, such borrowing is more feasible today than it would have been even a decade ago; there exist now numer-

[3] Which is presumably why the geological history of Pangaea, more than two hundred million years, rates a chapter in Alfred W. Crosby's marvelous *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (New York, 1986).

ous fine works of popularization by specialists in many different academic disciplines, works that offer scholarly, up-to-date, and lucid summaries of the contemporary state of knowledge in different fields. So there is no fundamental objection to the crossing of discipline boundaries; the difficulties are purely practical.

The obvious objections to big history, then, reflect little more than the inertia of existing conventions about the way history should be taught and written. In principle, there is nothing to prevent the historian from considering the past at very large scales and using essentially the same skills of research, judgment, and analysis that would apply at more conventional scales.

The Case for Big History

What are the positive arguments for big history? They follow from the negative arguments I have just discussed.

First, big history permits the asking of very large questions and therefore encourages the search for larger meanings in the past. If world history allows us to see the history of specific societies in a global context, history on even larger time scales allows us to consider the history of humanity as a whole in *its* context. It therefore invites us to ask questions about the relationship between the history of our own species and that of other living things. And it invites us to go back even further and try to place the history of life itself in a larger context. In this way, big history encourages us to ask questions about our place in the universe. It leads us back to the sort of questions that have been answered in many societies by creation myths. This suggests that history could play as significant a role in modern industrial society as traditional creation myths have played in nonindustrial societies; but it will do so only if it asks questions as large and profound as those posed in traditional creation myths.

In the second place, big history allows us to tackle these large questions with new approaches and new models because it encourages the drawing of new links between different academic disciplines. It can be seen, therefore, as an appropriate response to the intellectual apartheid between "the two cultures" of science and the humanities that C. P. Snow discussed in a famous lecture delivered in 1959.[4]

So far, the discussion has been at a very general level. In what

[4] C. P. Snow, *The Two Cultures and the Scientific Revolution* (Cambridge, 1959).

follows, I would like to give some specific illustrations of each of these arguments. First I will discuss a specific historical issue that can be approached at several different scales, the issue of economic growth in human history. What is the scale on which such a question can best be discussed, and how do different time scales affect the way we view the question and its implications? I will argue that this is a question better debated at scales even larger than those conventional within the field of world history.

On the scale adopted in must histories of human society, growth of some kind, involving changed technology and increases in productivity, is palpably there. So it is easy to think of change, or even "progress," as a basic characteristic of human history, perhaps even a defining characteristic of our species. E. L. Jones has made these assumptions explicit in a series of recent studies that have done much to put large-scale historical questions on the agenda for professional historians. "Let us assume," he writes in a recent essay, "that a propensity for growth has been widely present in human society. This does not commit us to a neoclassical maximising position. Not everyone need be engaged in maximising on every margin at once. All that is needed is to accept that a desire to reduce material poverty is commonplace in our species, as well it might be considering that poverty exacts such a penalty in terms of dead babies, or at any rate of children without shoes."[5] On the scale of 5,000 years, this is all very plausible. And Jones himself has assembled the evidence for a long-term trend toward both extensive and intensive growth over this period.[6]

But is 5,000 years really the appropriate scale if our concern is with human beings and the societies they have created? If we are asking questions about the "propensities" or "desires" of the human species, surely the appropriate time scale is that of the species as a whole. How big is that? The earliest fossil evidence for Australopithecines, the first members of the hominid family, dates back about 4 million years.[7] The first evidence for *Homo habilis,* the earliest species that modern physical anthropologists are willing to classify within the genus *Homo,* dates back to almost 3 million years. The larger-brained species. *Homo erectus,*

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[5] Johan Goudsblom, E. L. Jones, and Stephen Mennell, *Human History and Social Process* (Exeter, 1989), p. 33.

[6] E. L. Jones, "Recurrent Transitions to Intensive Growth" in *Human History and Social Process,* Goudsblom et al.

[7] R. Lewin, *Human Evolution: An Illustrated Introduction,* 2d ed. (Oxford, 1989), offers a good introduction to hominid evolution.

first appears in the record about 1.9 million years ago. The relationship between *Homo erectus* and our own species, *Homo sapiens,* is a subject of great controversy, but an age of between 50,000 and 400,000 years for *Homo sapiens* would cover most positions within this controversy, and a figure of 250,000 years is a reasonable compromise. So, on this evidence, when did human history begin? For my purposes, a precise answer is not important. One could argue that "humans" have existed for 5 million years. But even un the more modest scale of 250,000 years, a question posed on a scale of a mere 5,000 years is likely to produce aberrant answers.

What does the problem of growth look like on the larger scale? If we take world population as a measure of the capacity of human societies to support growth, then the story of human history over several hundreds of thousands of years is one of small populations and local fluctuations that have left little trace in the historical record, and then a sudden and spectacular burst of growth in recent times. Early hominid populations were probably of the same order of magnitude as those of other great apes in recent times: perhaps 1 million, all living in Africa.[8] We must presume that the migrations that led *Homo erectus* out of Africa and into the colder climates of Eurasia about 1 million years ago (migrations that might have been accompanied by the mastery of fire), led to a considerable increase in the world population of hominids, which suggests that 2 to 4 million may be a reasonable guess for the world population 250,000 years ago. By 10,000 years ago, when forms of agriculture and permanent settlements began to appear in several distinct parts of the world, the population of the world could hardly have been more than 10 million. On these very rough estimates, human populations increased from perhaps 2 million to 10 million over a period of some 250,000 years, and most evidence for intensification comes from the last 40,000 years of that huge range. This is a rate of growth so imperceptible that no modern economist would want to apply the word "growth" to it, and any "propensity for growth" one may claim to observe on this scale begins to look a pretty spectral thing.

In contrast, during the last 10,000 years, human polpualtions have risen from 10 million to about 200 million (2,000 years ago), and then, in an even more spectacular acceleration, to nearly 5 bil-

[8] The following is based on C. McEvedy and R. Jones, *Atlas of World Population History* (Harmondsworth, 1978).

lion today. On this reckoning, human history consists of about 250,000 years of relative stasis followed by a mere 10,000 years of growth, most of which has been concentrated into the last few hundred years. In other words, even on a rather restricted definition of our species, growth has occupied a mere 4% of its history: the really spectacular growth lias occurred in the last 0.2% of that history.

The accompanying figure graphs no more than the last two and a half millennia of human population growth. To get a sense of human population growth over 250,000 years, one would have to add a further ninety-nine graphs to the left, and on most of those graphs, the line representing human population would merge into the graph's base line. Only in the last three or four graphs would it begin to rise above that line.

To the extent that population growth can serve as a surrogate for growth in average levels of productivity, we must conclude that growth, far from being the normal condition of humanity, is an aberration. The growth that E. L. Jones has documented over the past 5,000 years is evidence not for the normality of growth,

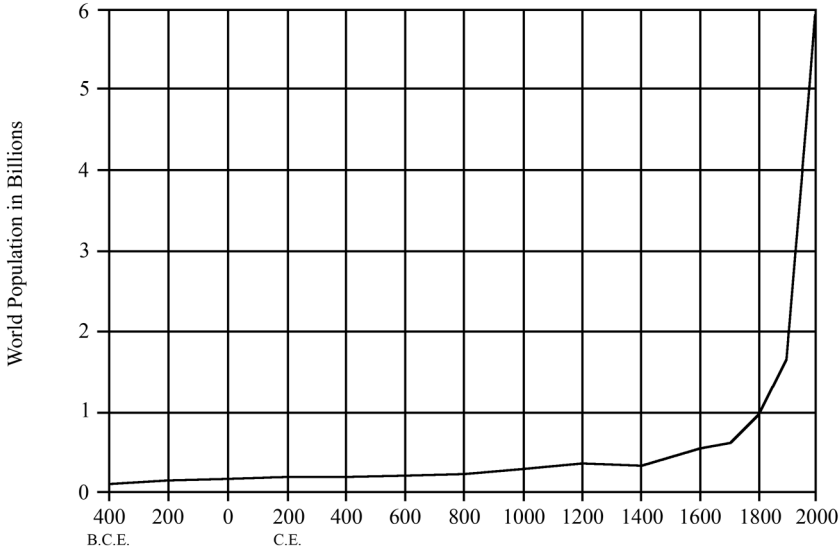

FIGURE 1. World Population, 400 B.C.E. to 2000 C.E.

Adapted from C. McEvedy and R. Jones, *Atlas of World Population History* (Harmondsworth, 1978), p. 342.

but rather for a sudden breakdown in an ancient equilibrium between a large mammal species and the environment it inhabits. Carlo Cipolla comments: "A biologist, looking at the diagram showing the recent growth of world population in a long-range perspective, said that he had the impression of being in the presence of the growth curve of a microbe population in a body suddenly struck by some infectious disease. The 'bacillus' man is taking over the world."[9] Why did this particular large species of mammal suddenly begin to display the demographic behavior of a plague species? On the scale of human history as a whole, this is the really interesting question.

A slightly different way of saying the same thing is to point out (what everyone knows, although few expend much intellectual effort on the fact) that the history of human beings has been above all a history of hunter-gatherer societies.[10] In an important sense, hunting and gathering are the "natural" activities of human beings, and what has occurred in the last 5,000 years is profoundly "unnatural." There is nothing "natural" about the state, or civilization, or economic growth. The entire history of agrarian and now industrial civilizations is from this point of view a curious and rather surprising coda tacked unto the end of human history.

The large perspective affects our approach to the problem of growth in other ways, too, for it raises a host of further issues, some of which are ethical, and some of which need to lie discussed on a very large scale indeed. Should we admire the explosive growth of the past few millennia? Is it, perhaps, what distinguishes us from other living species? Or can we identify similar turning points in the history of other living species? Is human history governed, ultimately, by the rhythms of natural history as a whole? What is the likely impact of our own history on the history of the planet as a whole? Is the rapid growth of human society proof of a fertility in invention so astonishing (and so untypical of animal species as a whole) that it will continually outstrip the dangers it creates? Casual judgments about such questions lie behind much historical writing, so it is important that the questions be posed seriously and clearly. They should also be debated

[9] Carlo M. Cipolla, *The Economic History of World Population*, 6th ed. (Harmondsworth, 1974), pp. 114–15.

[10] Marshall Sahlins's *Stone Age Economics* (London, 1972) was a pioneering attempt to construct an economics for such societies.

rigorously if history is to take itself seriously as a discussion of what it means to be human, a discussion that inevitably has ethical dimensions.

A discussion of "growth" highlights another advantage of thinking about the past on a very large scale. Thinking about the very long term means thinking about very large trends. This makes it possible to discuss the future in ways that are not possible if historians concentrate on the short term. Is accelerating economic growth a trend that can be projected forward indefinitely into the future? Presumably not, simply because the mathematics of such a trend will soon lead us toward some embarrassing infinities: infinite population growth, infinite increase in consumption, and so on. So we can be certain, after exploring these very long trends, that they can not be projected indefinitely into the future. What, precisely, does that mean? What mechanisms will alter the accelerating trends we now observe? Will they be Malthusian in nature? Or climatic or ecological? Or will they involve rational human intervention? And when will the trend change? These questions, of vast significance for our view of the next few hundred years and for our understanding of political and economic decisions that have to be made today, can be tackled seriously by historians only if we look more seriously at very long trends. What drives the long-term trends? What drives the machinery of growth in the very long term?[11] How fast can that machine go, and at what point is it likely to stall? By raising questions of this sort, big history may make it possible to end the ancient historians' taboo on discussion of the future as well as the past. That taboo made sense, but only as long as historians refused to discuss trends large enough to yield significant hints about the future. These examples should indicate some of the ways in which large-scale history can make it easier to pose fundamental questions that cannot be tackled at smaller scales.

I also suggested earlier that one of the virtues of big history may be that it will encourage historians to become more familiar with the models, techniques, habits of thinking, and types of evidence used in other disciplines. This in turn may help historians

[11] These questions lie at the heart of the recent work of E. L. Jones. See *The European Miracle: Environments, Economies and Geopolitics in the History of Europe and Asia* (Cambridge, 1981); *Growth Recurring: Economic Change in World History* (Oxford, 1988); and his essays in *Human History and Social Process,* Goudsblom et al.

view their own discipline in new ways.[12] I would like to give a brief illustration of what I mean. It concerns the problem of agriculture and its origins, and it draws on the work of David Rindos.[13] Rindos seeks the answer to a historical question (the reasons for the emergence of agriculture) using a Darwinian paradigm. He argues that the emergence of agriculture is a familiar process in natural history, where it can be described as a form of coevolution, the evolution of a symbiotic relationship between two very different species. Agriculture is not unique to humans, for many other species of animals, including several types of ants, can also be said to have developed forms of agriculture, or "domestication," in which the animal aids in the reproductive success of an edible plant. Within the Darwinian paradigm, coevolution, whether of ants and trees or of humans and grains, is a mutual process, one to which both partners contribute something. It is also an essentially blind process, one that involves no element of conscious intention. Here is Rindos's definition of "domestication":

> Domestication is a coevolutionary process in which any given taxon diverges from an original gene pool and establishes a symbiotic protection and dispersal relationship with the animal feeding upon it. This symbiosis is facilitated by adaptations (changes in the morphology, physiology, or autoecology) within the plant population and by changes in behavior by the animal.[14]

In the case of human agriculture, coevolution was presumably encouraged by the fact that hunter-gatherers were likely to scatter the seeds of plants they favored around frequently used camp sites. Plants that offered the most attractive taste were the ones most likely to be selected in this way, so these plants were most likely to flourish near camp sites. This is what Rindos calls the "dump-heap model for agricultural origins."[15]

Is Rindos merely using a Darwinian analogy here, or is he

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[12] One of the best recent discussions on the role of contingency in history can be found in a book by palaeontologist Stephen Jay Gould: *Wonderful Life: The Burgess Shale and the Nature of History* (New York, 1989).

[13] David Rindos, *The Origins of Agriculture: An Evolutionary Perspective* (New York, 1984).

[14] Ibid, p. 143.

[15] Ibid,pp. 134–35.

claiming that the Darwinian arguments can be applied directly to human history? As I understand it, he claims (after preparing his ground with an elaborate exorcism of the ghost of Herbert Spencer) that the argument is more than analogy; however, the Darwinian argument needs to be modified in some important respects before it can be used as a tool for the interpretation of human history. As his definition of "domestication" suggests, in the natural world coevolution, although it requires behavioral changes, also involves genetic change in both partners to the relationship. In the case of the human domestication of grains, this is not necessarily true. It is certainly true that agriculture encouraged rapid genetic change on one side of the evolving relationship, that of the plants; but Rindos's argument does not require that this be true of both sides. Human groups evolved culturally. Their behaviors and cultural changed in ways that maximized the benefits they procured from domesticated plants, and simultaneously improved the reproductive chances of the plants. So in this case, coevolution involved genetic change on one side and behavioral change on the other. This line of argument leads Rindos to the notion of "cultural evolution": "Behavior, like any other phenotypic trait of an organism, is amenable to selection. Thus behaviors may influence the differential reproductive success of a lineage over time. If the presence of a new behavior increases the probability that a lineage will prosper (in numerical terms), the change in behavior has increased the fitness of that lineage."[16]

At issue here is not whether Rindos's account of agricultural origins is right or wrong. The crucial point is that historians can only gain by considering seriously the ways in which other disciplines solve problems. Drawing closer links between the traditional content and methodology of history and that of other disciplines can only enrich the theoretical and methodological toolbox available to historians.

A History Of 15 Billion Years

But is big history manageable in practice? In particular, can history be taught at this scale? The best proof is in the doing. At Macquarie University in Sydney, we have been teaching since 1989 a first-year history course that does just what I have proposed. It discusses history on many different time scales, beginning with

[16] Rindus, *The Origins of Agriculture,* p. 255.

that of the universe itself.[17] Naturally, this course is only one of many possible ways of approaching big history, and the specific ways we approach it may or may not be palatable to other historians. But our experience suggests that there is nothing particularly difficult about teaching such a course once one has shifted mental gears. So I will end with a brief description of our approach to big history.

The Macquarie course is taught over thirteen weeks; it offers two lectures a week and one tutorial. Lecturers come from many different disciplines: astronomy, geology, biology, palaeontology, anthropology, prehistory, classical history, and modern history.

The course begins with lectures on time and creation myths. The lecture on time offers an introductory discussion of the medium within which historians operate (for the most part without questioning it); the lecture attempts to demonstrate the differences in conceptions of the nature of time in different societies and to help students begin to grasp large and unfamiliar time scales. The second lecture discusses creation myths from many different societies. Its aim is to suggest that history itself may best be regarded as a form of modern "creation myth," in the sense that it reflects the best attempts of our society to answer questions about origins, just as the Genesis account or the creation myths of Australian Aboriginal society reflect the attempts of very different societies to answer fundamental questions about the origins of the heavens, the planet, living things, human beings, and human society. The drawing of this parallel is also a way of suggesting that history, like traditional creation myths, can pose questions of the most fundamental kind. And this, it seems to me, is the first payoff for the teacher of a course on this scale; no special effort is required to explain why the subject matter being taught is important. Its importance is selfevident.

After these introductory lectures, the course starts at the beginning, offering a narrative that is unconventional only because of the scale on which it tells its story. Two lectures given by a professional astronomer discuss current theories on the origins of the universe itself and the clusters of galaxies and stars that are the largest structures the universe contains. Two lectures are given on the history of the solar system and the history of the earth and its atmosphere. These are followed by lectures summa-

[17] For a more detailed description see "The Longest Durée: A History of the Last 15 Billion Years," *Australian Historical Association Bulletin* 59–60 (1989): 27–36.

rizing current theories and evidence on the origins of life on earth, the main laws of biological evolution, and the main stages of the evolution of life. A lecture on the evolution of human beings from apelike ancestors follows. Our own species appears in the course only in the fifth week of the thirteen-week course.

Given the influence of conventional discipline boundaries, this appearance inevitably marks a crucial turning point in the course. This is the point at which disciplines conventionally classified as "sciences" are left behind in favor of disciplines conventionally classified as "social sciences" or "humanities." The transition requires some discussion of what is meant by the conventional distinction between scientific and nonscientific disciplines, which in turn requires some discussion of the nature of the "truths" offered by both scientists and historians. So at this point there is an introductory lecture on theories of science, which poses the question: is history less scientific than science? (The answer is a cautious but qualified "No.") This lecture is designed to highlight the way in which big history can pose issues not just of content, but also of methodology. Is history a science? In what sense can it claim to offer truths more certain than those of traditional creation myths? Should history aspire to its own "paradigms" (in the sense made familiar in the work of Thomas Kuhn)?[18] Is there any fundamental difference between the types of evidence offered by scientists and those offered by historians? (Is a written document fundamentally different from the red-shifted spectrum of a distant galaxy?) How useful are models? Problems of historical methodology do not vanish when history is viewed on a large scale; on the contrary, they can be posed more clearly when the methodologies and types of argument used by historians are contrasted with those of researchers in many other disciplines. To ensure that this is true, lecturers and tutors in the course concentrate at every point on the *evidence* for the theories they are discussing.

From this point, the content of the Macquarie course should be more familiar.[19] Lectures follow on the nature of paleolithic societies and the significance of hunter-gatherer technologies and life-styles in the past and present. Then come lectures

[18] Thomas Kuhn's most influential work is *The Structure of Scientific Revolutions,* 2d ed. (Chicago, 1970).

[19] To give some shape to the lectures that follow, we have adopted as a sort of provisional "paradigm" the model of social structure described in Eric Wolf's magnificent *Europe and the People without History* (Berkeley, 1982).

on the emergence of agriculture, the earliest political and class structures, and the very earliest civilizations. Only at this point, in the ninth week of the course, do we begin to discuss problems that come within the domain of conventional history writing. Later lectures discuss early civilizations and the classical civilizations of Europe, Asia, and the Americas. Discussion of pre-Columban America is particularly fruitful as it poses fascinating questions about the parallel development of agrarian civilizations in parts of the globe that seem to have had no cultural contact for many thousands of years. Then there is a series of lectures on the emergence of a distinctively modern world and the nature of the world we inhabit at the end of the second millennium of the Christian calendar.

The final lecture, given jointly by myself (a historian) and a colleague who is a biologist, attempts an overview of the course as a whole. It asks a question that can only be asked in this kind of course: is there a discernible pattern to the past? It poses the question on three different scales—that of humanity, the planet, and the universe. Our answer? Yes, there arc large patterns. In some sense history at all three levels is a fugue whose two major themes are entropy (which leads to imbalance, the decline of complex entities, and a sort of "running down" of the universe) and, as a sort of counterpoint, the creative forces that manage to form and sustain complex but temporary equilibria despite the pressure of entropy.[20] These fragile equilibrium systems include galaxies, stars, the earth, the biosphere (what James Lovelock has referred to as "Gaia"[21]), social structures of various kinds, living things, and human beings. These are all entities that achieve a temporary but always precarious balance, undergo periodic crises, reestablish new equilibria, but eventually succumb to the larger forces of imbalance represented by the principle of "entropy." They all share the rhythm of "punctuated equilibrium" that Stephen Jay Gould and Niles Eldredge have detected in the history of life on earth.[22] These are entities that live, develop, and then die. Such patterns can be found at all time scales, so in this sense history is, as the mathematicians of chaos would say, "self-

[20] Some Justification for these grand speculations can be found in Paul Davies, *The Cosmic Blueprint* (London, 1989).

[21] James Lovelock, *Gaia; A New Look at Life on Earth* (Oxford, 1987) and its sequel, *The Ages of Gaia* (Oxford, 1988).

[22] For a brief summary, see Stephen Jay Gould, "The Episodic Nature of Evolutionary Change" in his *The Panda's Thumb* (Harmondsworth, 1980), pp. 149–54.

similar." Seen in this perspective, human history is the story of one such equilibrium system, which exists on the scale of a million or so years. And the history of the last few thousand years deals with the experience of that system as a long period of equilibrium was punctuated by a period of turbulence and instability. In this perspective, the most profound question that can be asked by a member of the species Homo sapiens living in the modern era is this: will human society manage to establish a new equilibrium of some kind? Or will it succumb to the forces of entropy?

Coda

This paper has been concerned with presenting the case for big history. It may seem, therefore, that it constitutes an attack on "small history." So I will conclude by emphasizing that this is not so. My real complaint is not that historians have concentrated on the details; it is that the profession has tended in the century since Ranke to define its task almost exclusively in terms of detailed research. As a result, historians have neglected the larger questions of meaning, significance, and wholeness that can alone give some point to the details. If history is to reestablish its centrality as a discussion about what it means to be human, it must renew the interest in the large scale that was taken for granted by historians in the days before history became a "science."