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An Inquiry into History, Big History, and Metahistory

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Discussion Research ID	DPR-2026-1167
Year	2011
Field	Arts and Humanities
DOI	10.21237/c7clio21202
Author ORCID	0000-0002-0827-6525
Licence	CC-BY
Original source	Cliodynamics The Journal of Quantitative History and Cultural Evolution
Permanent link	https://discussionpublishers.com/research/0cde5310-716e-4767-9674-38f75f251bd2
Publisher	Discussion Publishers discussionpublishers.com

Abstract

This editorial introduces the special feature, 'History, Big History, and Metahistory'

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Cite as: David C. Krakauer, John Lewis Gaddis, Kenneth L Pomeranz (2011). An Inquiry into History, Big History, and Metahist. Disc

UC Riverside
Cliodynamics

Title
An Inquiry into History, Big History, and Metahistory

Permalink
https://escholarship.org/uc/item/7xk1n3wb

Journal
Cliodynamics, 2(1)

Authors
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Publication Date
2011

DOI
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Discussion Publishers edition DPR-2026-1167 https://discussionpublishers.com/research/0cde5310-716e-4767-9674-38f75f251bd2

Cliodynamics: the Journal of Theoretical and Mathematical History

Editors' Column: An Inquiry into History, Big History, and Metahistory

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What is history anyway? Most people would say it's what happened in the past, but how far back does the past extend? To the first written sources? To what other forms of evidence reveal about pre-literate civilizations? What does that term mean – an empire, a nation, a city, a village, a family, a lonely hermit somewhere? Why stop with people: shouldn't history also comprise the environment in which they exist, and if so on what scale and how far back? And as long as we're headed in that direction, why stop with the earth and the solar system? Why not go all the way back to the Big Bang itself?

There's obviously no consensus on how to answer these questions, but even asking them raises another set of questions about history: who should be doing it? Traditionally trained historians, for whom archives are the only significant source? Historians willing to go beyond archives, who must therefore rely on, and to some extent themselves become, psychologists, sociologists, anthropologists, archeologists? But if they're also going to take environments into account, don't they also have to know something about climatology, biology, paleontology, geology, and even astronomy? And how can they do that without knowing some basic physics, chemistry, and mathematics?

You see where this is going: history, by this capacious definition, includes everything that has happened up until the present moment – and because the present moment has already become the past by the time you've finished reading this sentence, history must also provide a basis (what other one could there be?) for anticipating the future.

What is to prevent history, then, from being the study of "life, the universe, and everything," as the late Douglas Adams proposed in his *The Hitchhiker's Guide to the Galaxy*? Nothing in principle, but there is a problem in practice, which is that no one person, or academic department, or professional discipline, or method of inquiry, can do it all. Students of this kind of Very Big

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Citation: Krakauer, David C., John Gaddis, and Kenneth Pomeranz. 2011. Editors' Column: An Inquiry into History, Big History and Metahistory. *Cliodynamics* 2: 1–5.

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History have for very good reasons divided themselves into fields, sub-fields, and even micro-fields, knowing that things rarely get simpler the more closely you look at them.

Much good has come of this. Our knowledge of this capaciously defined past has expanded exponentially over the past several hundred years. We now have a much clearer sense of who we are and where we came from than was available, say, to Copernicus, when he first ventured the suggestion that the universe did not revolve around us.

Some bad has come of this process as well, however. For if the volume of information in relation to time looks like a hockey stick as it approaches our era, rapidly accelerating in the production of contemporary knowledge –then it is a laminated hockey stick, the parts of which define a trajectory without interacting with one another. How much do we really know, therefore, about where we came from, who we are – and where we may be going – if the disciplines we've divided ourselves into have lost the languages that would allow them to speak to anyone apart from themselves?

Moreover, it seems likely that the disciplines themselves develop less than optimally when they lack ready access to each other's insights and methods. Indeed it seems likely that history suffers most of all from such segmentation. At least to some extent history, more than the study of literature, or economics, or political science (though perhaps not much more than anthropology or sociology) aims to integrate the understanding of how human social arrangements, technologies, interactions with the larger biosphere, intellectual creations, and even our habitual cognitive and emotional responses to the world around us have changed over a given period of time: no matter what s/he emphasizes as a researcher, the person who teaches a history of 19th century England knows it cannot omit dramatic changes in birth and death rates, the expansion of suffrage, the publication of *The Origin of Species*, the expansion of overseas possessions, or the environmental consequences of industrialization. So despite what has sometimes seemed a strong allergy to "theory" (of various sorts) in history departments, historians may have the most to gain by opening more lines of communication to people studying change over time in various phenomena and on various time-scales.

These papers have grown out of a series of conversations and meetings, sponsored by the Santa Fe Institute, on how we might recover such languages. It proceeds from the proposition that if generalization is necessary within particular disciplines – how could it not be? – then it should also be useful across all the disciplines that take, as the subject of their inquiries, Very Big History. It pursues the possibility of taking what one of our contributors, Murray Gell-Mann, has called "a crude look at the whole." It explores the possibility that the sciences of complexity and its many tributary fields and concepts pioneered at Santa Fe, may provide new methods, or minimally

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metaphors, by which to do this. It is premised on the notion that curiosity – the foundation of all knowledge – requires the ability to be both a specialist and a generalist at the same time. And that this simultaneity of perspective is in need of new trans-disciplinary approaches and ideas.

Our title *History, Big History and Metahistory*, requires a brief explanation. By "history," we mean the study, chiefly, of written records, extending from the most ancient cuneiform tablet through the most recent e-mails and twitters. By "big history," we mean all reconstructions of the past that do not rely on written materials. By "metahistory," we mean the patterns that emerge from both modes of inquiry that make generalization, and hence analysis, possible. We do not mean to imply by this sequence of terms that moving to the method and scale of "big history" is the only way to search for meaningful patterns. We are, however, confident that juxtaposing types of inquiry developed to deal with change in literate societies and those developed to deal with a much longer record of change has proved to be one very useful way of exposing important, often neglected questions, both about what it makes sense to look for in the always incomplete records of the past and about how to do the looking.

As in any good discussion, our contributors do not all agree with one another. Some insist that there are unifying principles, or laws, to which both human and biological history are subject. Others seek ideas, tools, and perhaps standards of truth from dynamical systems, evolution, and statistics that could augment traditional approaches to history, but do not necessarily see such borrowings as requiring that history and big history become a single discipline. One contributor sees any attempt at unification in the humanities as dangerous, and citing as precedents the extent to which social Darwinism was used to abuse less powerful people and societies. All do share the view, however, that history is too important – and too encompassing – to be analyzed exclusively through the methods of qualitative text-based narratives. We have arranged our contributors alphabetically, for no better reason than to shuffle their ideas and to avoid enforcing on this journal's readers the editor's conclusions.

We start with David Christian who discusses the chronometric revolution, and how this has lead to a single historical continuum stretching all the way back to the big bang, allowing for what he calls, Grand Unified Stories.

Douglas Erwin explores how paleontologists deal with the vagaries of preservation, and how statistical techniques developed in biology, have been applied to textual evidence, and the complexities of non-uniform trends leading to convergent and parallel events.

John Gaddis shows that several 19th century searches for a science of history – those of Leo Tolstoy, Carl von Clausewitz, and Henry Adams –

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grasped key concepts of complexity theory, but lacked the means of visualizing and verifying it that are available today.

Murray Gell-Mann discusses the nature of empirical regularities, and their relationship to measures of complexity. Gell-Mann illustrates how apparently complex histories and patterns can sometimes be organized using simple models of growth and scaling.

Geoffrey Harpham discusses the possible limitations and abuses of unified frameworks of explanation, using the history of philology as a case study. Unchecked, scientific trajectories in a social matrix can lead to unjustified inferences.

David Krakauer introduces a range of concepts from non-linear dynamics, statistical physics and evolutionary biology, that he argues should be of use to all students of history. Using examples from traditional historicism, Krakauer shows how history often uses analogs of concepts and tools expressed quantitatively in the natural sciences.

John McNeill explores parallels between cultural and biological evolution, exploring patterns of increasing cultural heterogeneity through time, and the role that specialist (pandas) and generalist (pigs) societies and states have played in explaining these patterns.

Ken Pomeranz describes the ways in which naming historical phenomena influences how we then analyze them. Arguing that many of the classification schemes that are conventional among historians serve some other purposes well, but are not very conducive to seeking meaningful generalizations or engaging in dialogue with scientists, he suggests other approaches, while also giving reasons why they are far more likely to complement than displace currently popular taxonomies.

Fred Spier, speaking as an historian, explores how big history might be brought within a reductive framework of physics, using the concept of free energy rate density, as a means of organizing major transitions, from the abiotic to the biotic and cultural domains.

Peter Turchin explores the value of general quantitative theory in areas where prediction is limited, and comparative data and retrodiction need to be explored. The transformation of natural history into quantitative biology is used as possible precedent and model for a transformation of qualitative history.

Geerat Vermeij considers a grand, economic theory of history, in which biology and culture might both be subsumed. Concepts of competition, feedback and power provide potential unifying historical concepts.

Geoffrey West argues for quantitative approaches to history through a suitable choice of coarse-grained variables. West argues that is unlikely that we shall discern common patterns at the level of individuals, but if we allow

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ourselves to study collective phenomena, such as urban systems, then we might make surprising new discoveries.

No reader is likely to find all of these contributions persuasive, or perhaps even congenial. Nonetheless, we think that most will gain more from engaging with them in their current diversity than they would gain from any superficial consensus we could wring from them. Readers may think of some papers as introducing them to new tools, potentially useful for their current inquiries or for others they had previously deemed impossible. Others stand as arguments about what sorts of inquiries should be attempted; still others as preliminary reports from lines of inquiry (in various historical disciplines) that it would be good for a wider range of scholars to know about. Each of these, of course, bears on the others, at least indirectly: what we should ask, what tools we have for answering new and old questions, and what people have found by asking unusual questions or using unusual tools are obviously overlapping issues. The overlaps on display here are not nearly large enough to let us suggest a single, unified agenda for further work; they are, however, sufficiently numerous to suggest many places where more focused inter-disciplinary projects might take root and prove fruitful. Perhaps even more important, these efforts should give readers what the meetings they sprang from gave to its participants: a better sense of the range of conversations we might join, the opportunities and problems in those discussions, and some ways in which joining new conversations will give us new ways of analyzing our common past.

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