Journal of Interdisciplinary History, L:4 (Spring, 2020), 517–545.

Myron P. Gutmann

Quantifying Interdisciplinary History: The Record of (Nearly) Fifty Years

The *Journal of Interdisciplinary History* began publication in 1970, after the founding of quantitative history. That transformation had already been underway for nearly two decades, led by an early generation of quantitative political historians; by the *Annales* school in France; by historical demographers in France, England, and the United States; and by generations of economic historians who had studied prices and moneys, among other things. Other publications had emerged, beyond the *Annales E.S.C.*; the *Historical Methods Newsletter*, for example, began publication in 1967. The great innovation by the editors of the *JIH* lay elsewhere, in a broad conception of what constituted an interdisciplinary approach to historical research, and the energy to find the authors who were engaged in that research and who were ready to publish.

The development of quantitative approaches to history, especially during the critical decades of the 1950s through the 1970s, is well documented elsewhere; it is not the main subject of this article. Anderson's brief exploration and more developed discussions by, among others, Bogue, Sewell, de Vries, and, most recently, Ruggles and Magnuson in the *JIH*'s winter issue of the anniversary volume describe that experience. Historians interested in new sources of information and in social-science theories and approaches, and social scientists interested in historical problems

Myron P. Gutmann is Professor of History, University of Colorado, an elected Fellow of the American Association for the Advancement of Science, and former Associate Editor of the *JIH*. He is the author of *War and Rural Life in the Early Modern Low Countries* (Princeton, 1980); *Toward the Modern Economy: Early Industry in Europe* (New York, 1988); co-author with George C. Alter, Susan Hautaniemi Leonard, and Emily R. Merchant, "Introduction: Longitudinal Analysis of Historical-Demographic Data," *Journal of Interdisciplinary History*, XLII (2012), 503–517.

This work was supported by the Institute of Behavioral Science at the University of Colorado Boulder. The author thanks Lindy Schultz for help with assembling the database of *JIH* content; George Alter, Vilja Hulden, and Emily Merchant for their review of a draft manuscript; and the *JIH*'s editors for their suggestions and for years of friendship, mentoring, and collaboration.

and long-term issues, converged in the 1950s and the 1960s to argue for theoretical and empirical approaches that made increasing use of quantitative materials and statistical analyses. The increased quantification of social science, and the ever-greater capacity for computation both encouraged and enabled this transformation, which has continued throughout the last half-century and longer as computational technology improved. Along the way, researchers have increased the size of their data sets, the sophistication of their statistical analysis, and the breadth of topics that they engage, moving from analysis of elections and legislators to large samples of census data and to integration with spatial and environmental information, all with ever-growing computational requirements.[1]

The development of quantitative approaches to historical research and analysis was not without its critics, and its experience has not been one of continuous growth. As early as 1962, Bridenbaugh criticized quantitative approaches in his presidential address to the American Historical Association, alongside his argument that urban-born historians (probably a euphemism for immigrants and their children) were unable to understand American life. Stone raised a different point in his 1979 article, "The Revival of Narrative," in which he challenged the change of argument in historical publications away from a narrative organization to one that dealt with structures and questions, and the need for historical discourse to return to arguments that were largely temporal. More recently, Sewell eloquently described his own journey into and out of quantitative approaches, arguing for the value of what he calls cultural strategies drawn from anthropology.[2]

Whatever the nature of the criticism, the hopes for quantitative approaches have not been achieved in the broader field

1 Margo Anderson, "Quantitative History," in William Outhwaite and Stephen P. Turner (eds.), *The Sage Handbook of Social Science Methodology* (Thousand Oaks, 2007), 248–264; Allan G. Bogue, *Clio & the Bitch Goddess: Quantification in American Political History* (Beverly Hills, 1983); Jan de Vries, "Changing the Narrative: The New History That Was and Is to Come," *JIH*, XLVIII (2018), 313–334; William H. Sewell, Jr., *Logics of History: Social Theory and Social Transformation* (Chicago, 2005); Steven Ruggles and Diana L. Magnuson, "The History of Quantification in History: The *JIH* as a Case Study," *JIH*, L (2020), 363–382.

2 Carl Bridenbaugh, "The Great Mutation," *American Historical Review*, LXVIII (1963), 315–331; Lawrence Stone, "The Revival of Narrative: Reflections on a New Old History," *Past & Present* (1979), 3–24. For comments and reactions, see Eric J. Hobsbawm, "The Revival of Narrative: Some Comments," *Past & Present* (1980), 3–8; de Vries, "Changing the Narrative"; Sewell, *Logics of History*.

of historical research. Although there is still plenty of research published each year that makes use of quantitative data and methods, it never succeeded in becoming a dominant force among North American historians. The amount and importance of that research have probably diminished since the 1980s, except in certain subfields, particularly those that align with social-scientific approaches, like historical demography and economic history, which continue to animate the history of quantitative approaches to historical research. The movement that began in the 1950s has persisted in some ways but has flagged in others, especially in North America, although Ruggles and Magnuson note a resurgence of quantitative history in recent years.[3]

Although not exclusively engaged by quantitative approaches, the *JIH* has from its very beginning supported the effort to quantify historical evidence. This article looks at that history, both on its own, and in the context of broader developments in historical methodology. It asks how the *JIH* engaged with, and published, articles that used quantitative data, how that engagement and publication has changed over nearly fifty years, and how developments in the *JIH* are related to broader changes in the presentation of historical data. Looked at through the lens of the *JIH*, quantitative methods in interdisciplinary history have both changed dramatically during the past fifty years and stayed remarkably the same. Such is the story told in this article. It examines the ways in which quantitative approaches appear in the corpus of articles published in the *JIH* and the ways in which they fit into the larger pattern of how quantitative approaches to historical scholarship developed throughout that same long period of time.

The argument revolves around three elements. The first two are the rise and fall of quantitative methods in historical research—a fact that the broader history summarized above already shows. To what extent did quantitative approaches change over time, both in terms of their proportion of articles in the *JIH* and in the kinds of methods that they employ? Although the proportion of quantitative articles published in the journal has not declined noticeably over time, some attributes of the publication record have changed substantially, in both interesting and important ways. That discovery entails looking beyond the proportion of

3 Ruggles and Magnuson, "The History of Quantification in History."

articles that are quantitative and the methods that they use to the topics covered and some characteristics of their provenance—especially the number of authors, their place in the profession, and the country where they work—to relate changes in the nature of quantitative methods to transformations in the professions of historical research, and in the character of the *JIH* itself.

THE *JIH* CORPUS The *JIH* has published 948 items in its first 49 volumes, not including review essays, book reviews, and corrections for errata. Table 1 classifies those 948 items into five categories, reflecting the journal's mix of content. The single largest group of published items (779 in all, or 82 percent) are the research articles—a category that combines both mainline articles and research notes and includes content that is both substantive and methodological, and articles that appeared in special topical issues or in general issues. Because research notes have appeared with diminished frequency in recent years, and represent a mix of substantive and methodological research, this article does not attempt to distinguish them.

One of the special characteristics of the *JIH* is its relatively frequent practice of publishing topical issues, which began with its first volume, continued through a series based on conferences organized by the editors, and culminates (to this point) with topical numbers organized by specialists in a field. These special issues generally included an introduction and sometimes comments on

Table 1 Type of Article, by Decade, Excluding Reviews and Errata

TYPE		1970S	1980S	1990S	2000S	2010S	TOTAL
Introduction to special issue	Freq.	6	7	2	4	6	25
	Percent	2.9	2.6	1.1	2.8	4.0	2.6
Research articles (including methods)	Freq.	171	198	157	125	128	779
	Percent	82.2	74.7	86.7	86.8	85.3	82.2
Synthetic articles	Freq.	9	32	1	4	6	52
	Percent	4.3	12.1	0.6	2.8	4.0	5.5
Comments on research or synthetic articles	Freq.	1	13	0	8	0	22
	Percent	0.5	4.9	0.0	5.6	0.0	2.3
Comment & Controversy	Freq.	21	15	21	3	10	70
	Percent	10.1	5.7	11.6	2.1	6.7	7.4
Total	Freq.	208	265	181	144	150	948

Table 2 Quantitative Analysis in *JIH* Articles by Decade (Research and Methods Only)

		1970s	1980s	1990s	2000s	2010s	TOTAL
Not quantitative	Freq.	63	63	64	57	32	279
	Percent	36.8	31.8	40.8	45.6	25.0	35.8
Quantitative	Freq.	108	135	93	68	96	500
	Percent	63.2	68.2	59.2	54.4	75.0	64.2
Total		171	198	157	125	128	779

the articles. The editors also published responses to articles and reviews, and replies to those responses, under the category of "Comment and Controversy." Finally, this article classifies a small group of publications as "synthetic" articles, each more a synthesis and evaluation of prior literature than original research.[4]

The distribution of articles between quantitative and non-quantitative (Table 2) has also changed over the years. An article is classified as quantitative if it contained quantitative information, drew conclusions from those data, and made use of the data beyond one or two context-setting tables or graphs reporting

4 For introductions to special issues, see Jordi Martí-Henneberg and Daniel A. Tirado-Fabregat, "Introduction: A New Look at the Origins of Economic Growth and Regional Inequality," *JIH*, XLIX (2018), 1–8; Theodore K. Rabb and Robert I. Rotberg, "History and Religion: Interpretation and Illumination," *ibid.*, XXIII (1993), 445–451; *idem*, "Introduction: Reevaluating the Reformation: A Symposium," *ibid.*, 1 (1971), 379–380; for an example of a comment, Dennis Romano, "Commentary: Why Opera? The Politics of an Emerging Genre," *ibid.*, XXXVI (2006), 401–409. For a good example of the interdisciplinary dynamic at work in "Comment and Controversy," see Jerome Kroll and Bernard S. Bachrach, "Medieval Dynastic Decisions: Evolutionary Biology and Historical Explanation," *ibid.*, XXI (1990), 1–28; the comment—Sumit Guha, "Sociobiology and Human Social Behavior," *ibid.*, XXIII (1993), 849–853; and the response—Kroll and Bachrach, "Sociobiology and Human Social Behavior: A Reply," *ibid.*, XXIII (1993), 854–857. For examples of synthetic articles, see Rabb, "Introduction: The Persistence of the "Crisis," *ibid.*, XL (2009), 145–150; de Vries, "The Economic Crisis of the Seventeenth Century after Fifty Years," *ibid.*, 151–194; Anne E. C. McCants, "Historical Demography and the Crisis of the Seventeenth Century," *ibid.*, 195–214; Peter Burke, "The Crisis in the Arts of the Seventeenth Century: A Crisis of Representation?" *ibid.*, 239–261; for synthetic articles in the special issue, "Biography and History: Inextricably Woven" (XL:3), Rotberg, "Preface: Biography and History," *ibid.* (2010), vii–vii; *idem*, "Biography and Historiography: Mutual Evidentiary and Interdisciplinary Considerations," *ibid.*, 305–324; Janet Browne, "Making Darwin: Biography and the Changing Representations of Charles Darwin," *ibid.*, 347–373; Lucy Riall, "The Shallow End of History? The Substance and Future of Political Biography," *ibid.*, 375–397; Susan Ware, "Writing Women's Lives: One Historian's Perspective," *ibid.*, 413–435.

information published elsewhere. Overall, nearly two-thirds of all research and methods articles had quantitative content, but the proportion varied from decade to decade. The journal published the smallest proportion of quantitative material in the 1990s and 2000s, but a sharp rebound occurred in the 2010s, when quantitative content appeared in three-fourths of the 128 articles published thus far. This interesting and important change merits further discussion later in this article.

A number of forces led to the smaller number of quantitative articles in the 1990s and 2000s, and the resurgence in the 2010s. Part of this change is a consequence of the reduction in interest—especially among North American scholars—in quantitative approaches after the 1980s. Another part is a function of choices that the editors made, specifically by organizing topical journal issues with a small number of quantitative articles during those years (especially one on social capital in 1999 and one on poverty and charity in 2005). A third, highly correlated part comes from a surge in articles, especially quantitative articles, from authors outside North America and the United Kingdom. That surge is a function of what appears to be a combination of declining submissions from North America and the United Kingdom and increased interest in quantitative approaches outside those areas. The extent of the change in the region where authors based their work will be examined later.[5]

INTERDISCIPLINARY QUANTITATIVE METHODS SINCE 1970 Quantitative methods in historical research have changed significantly since the *JIH* first appeared in 1970, as is evident in the articles that the journal published. Yet, and probably not surprisingly, the content of the journal (an average of about ten articles per year in the past decade) cannot represent all academic publishing on historical topics, but it can give us hints. By scrutinizing that content and the various quantitative approaches therein, we can make inferences about the evolution of quantitative methods in historical research generally, as well as about the journal more specifically. Although the change in quantitative methods is not linear, the

5 See the special issues "Patterns of Social Capital: Stability and Change in Comparative Perspective," *JIH*, XXIX (1999), 339–782; "Poverty and Charity: Judaism, Christianity, and Islam," *ibid.*, XXXV (2005), 347–522.

four distinct elements in the development of quantitative methods for interdisciplinary historical research are at least partly visible in the *JIH*. These elements overlap in ways that could support a more complex argument, but for the purposes of this study, this structure works well.

The first element is one that continues throughout the forty-nine-year experience of the journal—the use of descriptive statistics, expressed in tables, graphs, and maps, or computed as an index, such as the Gini Index of inequality or something derived from core demographic methods, such as a birth or death rate. The second element emerged as technology changed and researchers elevated their competencies and raised their expectations about the articles that they read. This second stage saw new strategies for managing data, especially for projects that involved multiple sources of information. The third element is the adoption of new statistical approaches, including more sophisticated sampling strategies and an increase in the use of inferential statistics such as correlation and regression, followed by the introduction of spatial statistics to supplement simpler spatial approaches such as mapping. One of the interesting intersections in this history is the contrast between the continued development of quantitative methods, which has shown significant advances, and the fact that overall interest in quantitative methods, especially in the United States and Canada, has declined.

The fourth element, which is coming to the fore today, signals opportunities for the future. The academic discipline of history has begun to confront new sources of data, with new quantities of information. More and more historical research is reliant on "big data," as it has come to be called, as well as on new approaches to traditional sources (such as newspapers) under the rubric of "digital history" or "digital humanities." These new developments are starting to break the mold in which the *JIH* was forged. The rise of big data has moved quantitative methods beyond inferential statistics; with a universe of data at the ready, researchers do not need to infer the characteristics of a population from those of a sample. Furthermore, the increasing interest in the digital humanities has broadened the context in which quantitative methods can flourish, most notably by adopting humanistic interpretations instead of defaulting to social-science theory and methods. The journal has just begun to see these kinds of sources, but what has been published is a glimpse into the future,

with the understanding that the *JIH*'s conception of what is interdisciplinary will continue to evolve.

ARTICLE SUBJECT MATTER AND QUANTITATIVE CONTENT The content of the *JIH* is wonderfully diverse. Topics range from art history to urban history, with many other fields of historical study dotting the landscape. Table 3 displays the range of topics included in the 779 research and methods articles published in the journal's first forty-nine volumes. The table is vastly simplified from the reality of the journal's content. The articles categorized as religion are generally about religion, but those categorized as the arts include the fine arts, music (including opera), and architecture. The category labeled "social history, status, mobility & capital" is especially diverse, both in content and method, including more kinds of social analysis than just those named. Even with such large groupings, the total is eighteen categories, plus a residual. The number of articles in each category ranges from 9 (military and spatial & transportation) to 130 (economic labor-force history); the largest categories are economic & labor-force (16.7 percent of the total); demographic (13.4 percent); social history, status & mobility (12.1 percent); political (9.1 percent); and family (7.3 percent).

The number and percentage of articles in any given category vary considerably from decade to decade—a function of changing historical tastes as well as the organization of conferences organized by the editors or topical issues that focused a decade's publication in one direction or another. Some of the original topics in the journal have rapidly or slowly declined in importance—for example, psychohistory (7.6 percent of articles in the 1970s but never more than 1.6 percent thereafter), family history (from 12.3 percent to 1.6 percent), or political history (from 11.7 percent to 5.5 percent)—whereas others have held their ground, including economic and labor history, demographic history, and a combined category called "health, medicine & nutrition" in this study.

The number of articles in some fields of study has ebbed and flowed, possibly reflecting changes in academic interest but more likely as a result of the choice of special topical issues, such as international relations in the 1980s, the arts in the 1980s and the 2000s, or religion in the 1990s. All the same, many of the fields that maintained their numbers through the years have also been buoyed by conferences and topical issues, including social mobility

Table 3 Field of Research, by Decade of Publication (Research and Methodology Articles Only)

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
All other (fewer than 9 articles)	Freq	5	0	7	4	10	26
	Percent	2.9	0.0	4.5	3.2	7.8	3.3
Arts	Freq	5	12	1	14	6	38
	Percent	2.9	6.1	0.6	11.2	4.7	4.9
Social history, status, mobility & capital	Freq	25	15	29	18	7	94
	Percent	14.6	7.6	18.5	14.4	5.5	12.1
Climate/environment/agriculture	Freq	1	14	3	2	15	35
	Percent	0.6	7.1	1.9	1.6	11.7	4.5
Crime & justice	Freq	0	4	8	5	6	23
	Percent	0.0	2.0	5.1	4.0	4.7	3.0
Cultural history	Freq	10	4	1	1	4	20
	Percent	5.9	2.0	0.6	0.8	3.1	2.6
Demographic	Freq	19	29	27	18	11	104
	Percent	11.1	14.7	17.2	14.4	8.6	13.4
Economic & labor-force	Freq	17	41	21	20	31	130
	Percent	9.9	20.7	13.4	16.0	24.2	16.7
Family	Freq	21	13	14	7	2	57
	Percent	12.3	6.6	8.9	5.6	1.6	7.3
Health, medicine & nutrition	Freq	1	17	7	8	11	44
	Percent	0.6	8.6	4.5	6.4	8.6	5.65

Table 3 (Continued)

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
International relations	Freq	2	14	2	1	1	20
	Percent	1.2	7.1	1.3	0.8	0.8	2.6
Methodology	Freq	20	4	2	0	2	28
	Percent	11.7	2.0	1.3	0.0	1.6	3.59
Military	Freq	2	1	1	2	3	9
	Percent	1.2	0.5	0.6	1.6	2.3	1.2
Political	Freq	20	19	16	9	7	71
	Percent	11.7	9.6	10.2	7.2	5.5	9.1
Psychohistory	Freq	13	2	0	2	1	18
	Percent	7.6	1.0	0.0	1.6	0.8	2.3
Race & slavery	Freq	4	4	5	2	3	18
	Percent	2.3	2.0	3.2	1.6	2.3	2.3
Religion	Freq	2	1	11	4	0	18
	Percent	1.8	0.5	7.0	3.2	0.0	2.3
Spatial & transportation	Freq	0	1	2	0	6	9
	Percent	0.0	0.5	1.3	0	4.7	1.2
Urban	Freq	4	3	0	8	2	17
	Percent	2.3	1.5	0.0	6.4	1.6	2.2
Total	Freq	171	198	157	125	128	779
	Percent	100	100	100	100	100	100

and social capital, climate history, demographic topics, and health and nutrition.[6]

Articles in different fields of study (Table 4) had different levels of quantitative content, ranging from one or two articles (arts, international relations, psychohistory, and religion), to three-fourths or more of all articles (climate/environment/agriculture, crime & justice, demographic, economic & labor-force, methodology, politics, and spatial & transportation). Most interesting, however, is the extent to which the journal has consistently published a mix of quantitative and qualitative articles even in fields in which much of the interest has been quantitative—notably, in the varied social-history topics (42.6 percent not quantitative), family history (29.8 percent not quantitative), health, medicine & nutrition (45.5 percent not quantitative), and race & slavery (33.3 percent not quantitative). This introduction helps us to understand the starting point for quantitative methods, and the long stability in descriptive findings based on quantitative data.

THE STARTING POINT: USING QUANTIFIABLE DATA AS HISTORICAL EVIDENCE The starting point for understanding the use of quantitative methods in historical research and publication is based on the fact that the most common forms of quantitative analysis and data display included in *JIH* articles are the simplest—descriptive tables, graphs, and maps, which represent tabulations of sums; distributions (medians, quartiles, etc.); or averages of data collected or transcribed by the authors and their research assistants and collaborators. Even with changes in technology and the availability of more sophisticated statistical tools, virtually every quantitative article in the first forty-nine volumes utilizes these descriptive strategies. To the extent that authors venture further, they employ

6 The special topical issues in the fields mentioned are "The Origin and Prevention of Major Wars," *JIH*, XVIII (1988), 581–925; "The Evidence of Art: Images and Meaning in History," *ibid.*, XVII (1986), 1–310; "Opera and Society," *ibid.*, XXXVI (2006), 319–738; "Religion and History," *ibid.*, XXIII (1993), 445–660; "Social Mobility in Past Time," *ibid.*, VII (1976), 191–373; "History and Climate," *ibid.*, X (1980); "Hunger and History: The Impact of Changing Food Production and Consumption Patterns on Society," *ibid.*, XIV (1983), 199–534; "Population and Economy: From the Traditional to the Modern World," *ibid.*, XV (1985), 561–779; "Patterns of Social Capital"; "Before the Pill: Preventing Fertility in Western Europe and Quebec," *ibid.*, XXXIV (2003), 141–314; "Poverty and Charity"; "Fertility, Mortality, and Family Formation during the Demographic Transistion," *ibid.*, XLII (2012), 503–675.

Table 4 Quantitative Articles by Field of Research (Research and Methodology Articles Only)

		NOT QUANTITATIVE	QUANTITATIVE	TOTAL
All other (fewer than 9 articles)	Freq	16	10	26
	Percent	61.5	38.5	
Arts	Freq	37	1	38
	Percent	97.4	2.6	
Social history, status, mobility & capital	Freq	40	54	94
	Percent	42.6	57.5	
Climate/environment/ agriculture	Freq	6	29	35
	Percent	17.1	82.9	
Crime & justice	Freq	5	18	23
	Percent	21.7	78.3	
Cultural history	Freq	10	10	20
	Percent	50.0	50.0	
Demographic	Freq	10	94	104
	Percent	9.6	90.4	
Economic & labor-force	Freq	22	108	130
	Percent	16.9	83.1	
Family	Freq	17	40	57
	Percent	29.8	70.2	
Health, medicine & nutrition	Freq	20	24	44
	Percent	45.5	54.5	
International relations	Freq	19	1	20
	Percent	95.0	5.0	
Methodology	Freq	7	21	28
	Percent	25.0	75.0	
Military	Freq	3	6	9
	Percent	33.3	66.7	
Political	Freq	16	55	71
	Percent	22.5	77.5	
Psychohistory	Freq	16	2	18
	Percent	88.9	11.1	
Race & slavery	Freq	6	12	18
	Percent	33.3	66.7	
Religion	Freq	17	1	18
	Percent	94.4	5.6	
Spatial & transportation	Freq	0	9	9
	Percent	0.0	100.0	
Urban	Freq	12	5	17
	Percent	70.6	29.4	
Total	Freq	279	500	779
	Percent	35.8	64.2	

relatively straightforward strategies for creating derivative indexes from the raw data, most commonly those found in the demographer's toolkit.

This consistency in the use of descriptively presented data contradicts a counter-argument that appeared by the end of the 1970s, suggesting that what were then new historical research strategies had run their course, as vividly presented in Stone's 1979 article, "The Revival of Narrative." Stone and others were mistaken both because researchers found quantitative evidence essential for some studies, and because quantitative evidence was not ever going to be a substitute for other historical sources. Early adopters were able to document changing conditions of life and expressions of opinion through practices like voting in elections and legislatures by mobilizing quantifiable information that could be tabulated and represented efficiently and convincingly. Stone's complaint, after all, was more about the change of argument in historical publications away from a narrative organization to one that dealt with structures and questions, and the need for historical discourse to return to arguments that were largely temporal. Nonetheless, at the scale of the academic article, quantitative evidence usually stands on its own, supporting an argument that is thematic, structural, and interdisciplinary, and only infrequently mixing quantitative and qualitative sources. What had changed in the 1960s, and has continued to change ever since, is the availability of new technology that made it easier to manage data for historical research and to tabulate and analyze those data for the purposes of drawing conclusions and testing hypotheses.[7]

The role of descriptive presentations of data is clear in the corpus of the journal. Much of the quantitative evidence presented in the *JIH* is straightforward, essentially counts or sums of items collected from a traditional source, such as wills or city directories, or copied from published data, such as the census. The first substantive article, in the first issue, is Thernstrom and Knights' "Men in Motion: Some Data and Speculations about Urban Population Mobility in Nineteenth-Century America," with tables of migration data; the next-to-last article in Volume XLIX is Li, Shelach-Lavi, and Ellenblum's "Short-Term Climatic Catastrophes and the

7 Stone, "Revival of Narrative." For comments and reactions, see Hobsbawm, "Revival of Narrative: Some Comments"; de Vries, "Changing the Narrative."

Collapse of the Liao Dynasty (907–1125): Textual Evidence," with rich graphical representations of climate and societal change designed to support an argument about their relationships. Between those examples are many others (nearly 500 in all). Good examples of one prominent category of analysis, the use of probate inventories to capture wealth inequality, are Nash's "Urban Wealth and Poverty in Pre-Revolutionary America" (volume VI), which examines the ways that Boston's poor differed from its rich; Shammas' "How Self-Sufficient Was Early America?" (volume XIII), which looks at evidence in probates for the tools that allowed families to be self-sufficient; and Urdank's "The Consumption of Rental Property: Gloucestershire Plebeians and the Market Economy, 1750–1860" (volume XXI), which examines the likelihood of rural testators owning rental property in England in the eighteenth and nineteenth centuries (and uses both descriptive statistics and regression analysis).[8]

In addition to the descriptive presentation of quantitative evidence, authors throughout the journal's history have often found it necessary to manipulate the data to produce a well-understood index, statistic, or indicator. One of the most common indicators that appears in the historical and contemporary literature about social inequality is the Gini coefficient, which allows researchers to compare the extent of economic inequality; it fits well with the research based on wills or probates just discussed. These measures are represented in the *JIH* corpus by, for example, Warden's study of Boston (volume VI) and Main's study of Massachusetts and Maryland (volume VII), in the context of a wide variety of data about early America. Valuable as the Gini Index is, demographic rates and ratios, plus the life table, are the most common set of constructed indicators in quantitative historical research. As such, they are well represented in the *JIH*. These methods appear as early as Wells' "Demographic Change and the Life Cycle of

8 Stephan Thernstrom and Peter R. Knights, "Men in Motion: Some Data and Speculations About Urban Population Mobility in Nineteenth-Century America," *JIH*, I (1970), 7–35; Yali Li, Gideon Shelach-Lavi, and Ronnie Ellenblum, "Short-Term Climatic Catastrophes and the Collapse of the Liao Dynasty (907–1125): Textual Evidence," *ibid.*, XLIX (2019), 591–610; Gary B. Nash, "Urban Wealth and Poverty in Pre-Revolutionary America," *ibid.*, VI (1976), 545–584; Carole Shammas, "How Self-Sufficient Was Early America?" *ibid.*, XIII (1982), 247–272; Albion M. Urdank, "The Consumption of Rental Property: Gloucestershire Plebeians and the Market Economy, 1750–1860," *ibid.*, XXI (1990), 261–281.

Table 5 Use of Core Demographic Methods, by Decade (Research and Methods Articles)

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
No core demographic methods used	Freq	92	117	73	57	87	426
	Percent	85.2	86.7	78.5	83.8	90.6	85.2
Core demographic methods used	Freq	16	18	20	11	9	74
	Percent	14.8	13.3	21.5	16.2	9.4	14.8
Total		108	135	93	68	96	500

SOURCE *JIH* Content Database. In this article, *core demographic methods* are defined as birth, death, marriage, and migration rates; infant mortality and illegitimacy rates (which are actually ratios); and the life table.

American Families" (volume II), and as recently as Bonneuil and Fursa's "Learning Hygiene: Mortality Patterns by Religion in the Don Army Territory (Southern Russia), 1867–1916" (volume XLVII).[9]

As Table 4 shows, research about historical populations and families together constitute a significant part of the *JIH* corpus (roughly one in five of all 779 articles, and an even larger fraction of all articles that include quantitative evidence). Roughly 15 percent of all quantitative articles feature core demographic measures as a primary indicator (Table 5), a figure that would be higher if articles with inferential statistics based on those demographic measures were the primary method. The distribution of articles that use core demographic methods over time is also included in Table 5, which shows their relatively high representation, peaking in the 1990s and declining in the 2010s as the journal moved to other topics.

The main point in this discussion is that quantitative methods have been consistently employed in the journal from its founding to the most recent issues, and that the most common methods have been the most straightforward—descriptive tables, graphs, and maps, and indexes computed and presented in a way that is readily understandable to readers. These patterns should not surprise us, but they should show the significant stability in the

9 G. B. Warden, "Inequality and Instability in Eighteenth-Century Boston: A Reappraisal," *JIH*, VI (1976), 585–620; Gloria L. Main, "Inequality in Early America: The Evidence from Probate Records of Massachusetts and Maryland," *ibid.*, VII (1977), 559–581; Robert V. Wells, "Demographic Change and the Life Cycle of American Families," *ibid.*, II (1971), 273–282; Noël Bonneuil and Elena Fursa, "Learning Hygiene: Mortality Patterns by Religion in the Don Army Territory (Southern Russia), 1867–1916," *ibid.*, XLVII (2017), 287–332.

quantitative methods presented in the journal, as they are in the rest of the general-purpose historical literature.

CHANGING TECHNOLOGY: NEW WAYS TO MANAGE INFORMATION AND THE MOVE FROM DESCRIPTIVE TO INFERENTIAL STATISTICS The emergence and continued importance of quantitative approaches to historical writing in the *JIH* and other publications is tightly linked to the availability and improvement of computing technology, both hardware and software. The work of historical researchers who have learned how to use these new technologies is reflected in the journal, especially in the early years. From its inception, the *JIH* published articles, reviews, and research notes employing and otherwise dealing with quantitative methods; a series of articles and reviews in its early issues chronicled the development of quantitative methods, the use of computers, and the opportunities for new insights. Those articles and reviews set the tone for the following years. After the early volumes, basic methods appeared less frequently in the journal as they became more widespread, and other publishing venues emerged. By that point, the explanation of methods had become integrated within articles that were primarily substantive in their content.[10]

Much of the discussion about methods in the journal and other publications focused on how to manage data. The classic example of a challenge to data management is record linkage, a topic that shows up in the journal's first issue in an article by Winchester and later in an article about sampling by Phillips in volume IX. This subject has been absent from the journal ever since, despite an upsurge in interest in record-linkage approaches due to new volumes of data and new technologies. Articles about managing data and incorporating new technologies have appeared sporadically in the journal, most visibly in a couple of articles about

10 For methodological publications in the early years, see Ian Winchester, "The Linkage of Historical Records by Man and Computer: Techniques and Problems," *JIH*, I (1970), 107–124; Stephen E. Fienberg, "A Statistical Technique for Historians: Standardizing Tables of Counts," *ibid.* (1971), 305–315; E. Terrence Jones, "Ecological Inference and Electoral Analysis," *ibid.*, II (1972), 249–262; Michael B. Katz, "Occupational Classification in History," *ibid.*, III (1972), 63–88; J. Morgan Kousser, "Ecological Regression and the Analysis of Past Politics," *ibid.*, IV (1973), 237–262; Robert P. Swierenga, "Computers and Comparative History," *ibid.*, V (1974), 267–286; Richard Jensen, "The Microcomputer Revolution for Historians," *ibid.*, XIV (1983), 91–111. By volume XIII, Rabb could write a methodological synthesis, "The Development of Quantification in Historical Research," *ibid.*, XIII (1983), 591–601.

capture-recapture approaches, but as historical research has evolved, this theme has not been one of the *JIH*'s primary focuses. Managing data and dealing with technology have moved to more specialized journals, such as *Historical Methods* (successor to the *Historical Methods Newsletter*), and to specialized books about computers and data management for historical research.[11]

Even though specific articles about the use of computers or the manipulation of complex data are no longer published in the journal, the fruits of that work continue to appear. In many cases, linked records lead to longitudinal data collections that allow researchers to follow the experiences of a person, a family, or even a piece of property over time, capturing its experiences and its responses to internal and external stimuli. Many social and spatial-mobility studies have used linked data (as did Thernstrom and Knights in the first volume). One of the most widely discussed record-linkage activities is family reconstitution, which has generated numerous longitudinal data collections, and multiple articles in the *JIH* over the years. Family reconstitution and its extensions (for example, research using a mix of sources beyond church registers or continuous registers of population) lend themselves to a variety of analytical approaches, starting with core demographic rates and the life table but also statistical regression models with

11 These early articles were specifically about computers and methods: Swierenga, "Computers and Comparative History"; Jensen, "The Microcomputer Revolution for Historians." For record linkage in the *JIH*, see Ian Winchester, "The Linkage of Historical Records by Man and Computer: Techniques and Problems," *JIH*, I (1970), 107–124; John A. Phillips, "Achieving a Critical Mass While Avoiding an Explosion: Letter-Cluster Sampling and Nominal Record Linkage," *ibid*., IX (1979), 493–508; for more recent record linkage literature, published elsewhere, Martha Bailey et al., "How Well Do Automated Linking Methods Perform? Lessons from U.S. Historical Data," *National Bureau of Economic Research Working Paper Series*, No. 24019 (2017), available at https://www.nber.org/papers/w24019; Angela R. Cunningham, "After 'It's Over over There': Using Record Linkage to Enable the Reconstruction of World War I Veterans' Demography from Soldiers' Experiences to Civilian Populations," *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, LI (2018), 203–229; Gerrit Bloothooft et al. (eds.), *Population Reconstruction* (2015), available at https://www.springer.com/gp/book/9783319198835; for capture-recapture, Julie M. Flavell and Gordon Hay, "Using Capture-Recapture Methods to Reconstruct the American Population in London," *JIH*, XXXII (2001), 37–53; Gidon Cohen, Lewis Mates, and Andrew Flinn, "Capture-Recapture Methods and Party Activism in Britain," *ibid*., XLIII (2012), 247–274; for general sources of quantitative methods for historians, Charles H. Feinstein and Mark Thomas, *Making History Count: A Primer in Quantitative Methods for Historians* (New York, 2002).

various names, including proportional-hazards models and event-history regression.[12]

Beginning in the 1990s, these more advanced methods of longitudinal data analysis began to appear in the journal, thus connecting the second element in the conceptualization above (improved computation) with the third (advanced statistical methods), primarily correlation and regression. Van Poppel's 1998 article in volume XXVIIII uses proportional-hazards regression models to show the factors that were most important in determining the timing and extent of remarriage for Dutch widows, widowers, and divorcees. The upshot was that most people remarried but that their chances of remarriage varied by sex (men more than women), age (younger women most likely to remarry), religion, and the causes of the previous marriage's dissolution (divorcees were likely to remarry, even more than the widowed). A steady flow of articles based on these data and methods followed, even a complete special issue (which I co-edited)—"Fertility, Mortality, and Family Formation during the Demographic Transition"—with six articles about fertility, mortality, and child abandonment in Europe and the United States.[13]

The appearance of regression-based techniques in demographic analysis in the 1990s is part of a longer-term trend in the *JIH* and elsewhere, in which an increasing proportion of quantitative articles make use of advanced and multivariate statistical techniques, often extending to the area of inferential statistics in which

12 For the connections between family reconstitution and event-history analysis, see Gutmann and George Alter, "Family Reconstitution as Event-History Analysis," in David Sven Reher and Roger Schofield (eds.), *Old and New Methods in Historical Demography* (New York, 1993), 159–177; for work on longitudinal analysis, Peter A. Baskerville and Kris E. Inwood (eds.), *Lives in Transition: Longitudinal Analysis from Historical Sources* (Montreal, 2015).

13 Frans van Poppel, "Nineteenth-Century Remarriage Patterns in the Netherlands," *JIH*, XXVIII (1998), 343–383. See also from the special issue, Nora Bohnert et al., "Offspring Sex Preference in Frontier America," *ibid.*, XLII (2012), 519–541; Mathew Creighton, Christa Matthys, and Luciana Quaranta, "Migrants and the Diffusion of Low Marital Fertility in Belgium," *ibid.*, 593–614; B. A. R. Eugercios, "Releasing Mother's Burdens: Child Abandonment and Retrieval in Madrid, 1890–1935," *ibid.*, 645–672; Julia A. Jennings, Allison R. Sullivan, and J. David Hacker, "Intergenerational Transmission of Reproductive Behavior during the Demographic Transition," *ibid.*, 543–569; Rebecca Kippen and Sarah Walters, "Is Sibling Rivalry Fatal? Siblings and Mortality Clustering," *ibid.*, 571–591; Rosella Rettaroli and Francesco Scalone, "Reproductive Behavior during the Pre-Transitional Period: Evidence from Rural Bologna," *ibid.*, 615–643.

Table 6 Use of Correlation and Regression, by Decade (Research and Methods Articles)

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
No correlation or regression used	Freq	88	101	62	37	60	348
	Percent	81.5	74.8	66.7	54.4	62.5	69.6
Correlation or regression used	Freq	20	34	31	31	36	152
	Percent	18.5	25.2	33.3	45.6	37.5	30.4
Total		108	135	93	68	96	500

the researchers analyzed a data sample to estimate the characteristics of the milieu from which it was drawn. This information is evident in the data of Table 6, which shows the number of research and methods articles that featured correlation or regression methods (or both). The number of such articles increased steadily from the 1970s (18.5 percent) to the 2000s (45.6 percent), before decreasing to some extent in the journal's content during the 2010s. The data reported in the table are simplified in a significant way; they consolidate various approaches to regression, depending on the structure of the data, the kind of outcome possible, and the software used. Even with that caveat, the findings are meaningful.

The data in Table 6 show a trend, culminating in the establishment of multivariate correlation and regression as an expected part of the toolkit that quantitatively oriented historical researchers bring to their problems. Nonetheless, it is important to note that the earliest issues of the journal had articles with regression and correlation—Tilly's in volume II, Kousser's in volume IV, Vinovskis' in volume VI, and Luria's in volume VII. These four articles are characteristic of the journal, both early and later in its history, by the diversity of their subject matter—political conflict, political (voting and legislative) analysis, population, and social status/mobility.[14]

The opportunities offered by new technology and innovative forms of interdisciplinary analysis have generated new strategies for historical research and writing, which found representation in the

14 Louise A. Tilly, "The Food Riot as a Form of Political Conflict in France," *JIH*, II (1971), 23–57; Kousser, "Ecological Regression and the Analysis of Past Politics"; Maris A. Vinovskis, "Socioeconomic Determinants of Interstate Fertility Differentials in the United States in 1850 and 1860," *ibid.*, VI (1976), 375–396; Daniel D. Luria, "Wealth, Capital, and Power: The Social Meaning of Home Ownership," *ibid.*, VII (1976), 261–282.

JIH. Beyond an increase in advanced statistical methods, the *JIH*'s interest in interdisciplinary approaches has brought a variety of new angles. Regression was the burgeoning area of methodological activity in the 1990s and 2000s, but spatial analysis, the environment, and climate were the areas of innovation in the 2010s. Some of these new areas of emphasis required new modes of quantitative analysis—especially spatially oriented regression and the integration of climate data with other aspects of life—and others required new strategies for data management and visualization. The journal has been substantially recast in the process.[15]

IDENTIFYING THE WRITERS OF QUANTITATIVE HISTORY—WHERE THEY LIVE AND WORK Something interesting happened to the *JIH* in the 2010s; Table 7 helps to understand what it was, distributing the 778 research articles published in the journal by decade and by the country of residence of the first author of each article. The first author is the focus in this analysis, mainly because it is not easy, nor necessarily valuable, to determine how much weight to assign multiple authors. It is difficult to know exactly, however, what it means to be the first author in a journal with content as diverse as that of the *JIH*. Some articles follow a model in which the first author is the one who has done the most work, but other models exist, including the economics model that lists all authors in alphabetical order, or the practice in some scientific laboratories of naming the most senior author either first or last. That caveat aside, selecting the first author is no more problematic than making some other choice. Evaluating every author somehow might be the ideal option, but it is difficult, to the point of being prohibitive.

15 See, for example, the special issue "Railways, Population, and Geographical Information Systems," *JIH*, XLII (2011), 1–157. See also these articles on environmental issues: Geoff Cunfer and Fridolin Krausmann, "Adaptation on an Agricultural Frontier: Socio-Ecological Profiles of Great Plains Settlement, 1870–1940," *ibid.*, XLVI (2016), 355–392; John Haldon et al., "The Climate and Environment of Byzantine Anatolia: Integrating Science, History, and Archaeology," *ibid.*, XLV (2014), 113–161; Michael McCormick et al., "Climate Change during and after the Roman Empire: Reconstructing the Past from Scientific and Historical Evidence," *ibid.*, XLIII (2012), 169–220; Ulf Buntgen and Lena Hellmann, "The Little Ice Age in Scientific Perspective: Cold Spells and Caveats," *ibid.*, XLIV (2014), 353–368. For context, see Ian Gregory, Donald A. DeBats, and Donald Lafreniere (eds.), *The Routledge Companion to Spatial History* (London, 2018); Gregory and Paul S. Ell, *Historical GIS: Technologies, Methodologies, and Scholarship* (New York, 2007).

Table 7 Articles in the *JIH*, by Country of First Author and Decade (Research Articles Only)

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
Australia/ New Zealand	Freq.	2	3	6	6	5	22
	Percent	1.2	1.5	3.8	4.8	3.9	2.8
Asia/Africa/Americas	Freq.	2	4	3	1	6	16
	Percent	1.2	2.0	1.9	0.8	4.7	2.1
Europe (includes Turkey)	Freq.	3	10	6	18	54	91
	Percent	1.8	5.1	3.8	14.4	42.2	11.7
Israel	Freq.	0	2	7	3	3	15
	Percent	0.0	1.0	4.5	2.4	2.3	1.9
United Kingdom	Freq.	10	14	15	14	12	65
	Percent	5.9	7.1	9.6	11.2	9.4	8.4
United States/Canada	Freq.	153	165	120	83	48	569
	Percent	90.0	83.3	76.4	66.4	37.5	73.1
Total	Freq.	170	198	157	125	128	778

What is striking in Table 7 is the steady decline in contributions from Canada and the United States, falling from 90 percent in the 1970s to about two-thirds in the 2000s before dropping precipitously in the 2010s to little more than one-third. At the same time, contributions from all other regions increased, but those from European countries, including the United Kingdom, accounted for more than half of all articles during the most recent decade. Table 8 adds more to the story by allowing us to categorize articles

Table 8 Quantitative Articles by Country of First Author

		NOT QUANTITATIVE	QUANTITATIVE	TOTAL
Australia/New Zealand	Freq.	6	16	22
	Percent	27.3	72.7	
Asia/Africa/Americas	Freq.	4	12	16
	Percent	25.0	75.0	
Europe (includes Turkey)	Freq.	21	70	91
	Percent	23.1	76.9	
Israel	Freq.	7	8	15
	Percent	46.7	53.3	
United Kingdom	Freq.	27	38	65
	Percent	41.5	58.5	
United States/Canada	Freq.	214	355	569
	Percent	37.6	62.4	
Total	Freq.	279	499	778
	Percent	35.9	64.1	

by country and whether they are quantitative or not. Articles with first authors from Israel, the United Kingdom, and North America were less likely to be quantitative than those from the rest of the world, especially from Europe.

The simplified list of regions in Table 9 shows the role of country of origin by decade in temporal detail. Two conclusions stand out. First, the United States and Canada, together with the countries in all other regions (Africa, Asia, Australia, New Zealand, and the rest of the Americas apart from the United States and Canada) were more likely than the enlarged European region to publish quantitative material in the 1970s and 1980s but less likely in the 1990s, 2000s, and 2010s. Second, the upsurge in quantitative publication during the 2010s came from all regions, the enlarged European region being the most important contributor.

Another aspect of article authorship tells an interesting story about the changing role of multiple authors in interdisciplinary research, and their contributions to quantitative approaches to that research. Larger teams of researchers are largely responsible for the recent trends toward new varieties of interdisciplinary history with their ever-bigger databases. Projects that require expertise in, say, climate and environment, as well as population, might require the input of ecologists, meteorologists, and demographers, all with a taste for solving historical problems. Similarly, data projects with tens or hundreds of millions of cases can require a team of researchers with a mix of expertise in data management and statistical analysis, together with an understanding of historical context. In recent years, the authorship, and the content, of the journal has leaned heavily in that direction.

Table 10, which reports the distribution of number of authors for *JIH* research and methods articles by decade, confirms that the nature of interdisciplinary historical writing has changed over time. The proportion of articles with a single author declined slowly from the 1970s to the 2000s, and then fell rapidly in the 2010s, to fewer than half of all articles. At the same time, the number of articles with two authors increased slowly; in the 2010s, the number of articles with three or more authors took a dramatic leap. Table 11 shows that the relationship between number of authors and quantitative content is also interesting. Articles in the journal with a single author are slightly more likely to have quantitative content than not, whereas those with two or more authors are highly likely to have quantitative content (nearly five out of six).

Table 9 Quantitative Articles by Country of First Author and Decade

		1970s		1980s		1990s		2000s		2010s	
		NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE
Other regions	Freq.	0	5	1	6	5	4	0	7	4	7
	Percent	0.0	100.0	14.3	85.7	55.6	44.4	0.0	100.0	36.4	63.6
UK/Europe/ Israel	Freq.	5	8	11	15	9	19	15	20	15	54
	Percent	38.5	61.5	42.3	57.7	32.1	67.9	42.9	57.1	21.7	78.3
United States/ Canada	Freq.	58	95	51	114	50	70	42	41	13	35
	Percent	37.9	62.1	30.9	69.1	41.7	58.3	50.6	49.4	27.1	72.9

Table 10 Number of Authors, by Decade

	DECADE	1970S	1980S	1990S	2000S	2010S	TOTAL
Single author	Freq.	149	163	127	95	61	595
	Percent	87.1	82.3	80.9	76.0	47.7	76.4
Two authors	Freq.	15	29	26	24	34	128
	Percent	8.8	14.7	16.6	19.2	26.6	16.4
Three or more authors	Freq.	7	6	4	6	33	56
	Percent	4.1	3.0	2.6	4.8	25.8	7.2
Total		171	198	157	125	128	779

The profile of the authors who wrote articles published in the journal is illuminating beyond the question of nationality and number of authors. In the early years, quantitative methods seem to have been primarily the province of younger researchers crossing disciplinary boundaries, mastering the technical skills associated with computers, and learning about statistics. Was that the case? If so, has it continued? To answer those questions, this article distills all the different types of statuses held by the journal's authors into six categories. This strategy is both labor-intensive and imprecise; the diverse nationalities of the journal's contributors complicates comparisons of academic status. It entails converting the position held by each author at the time of publication, as given in each published article, to its equivalent in the U.S. academic-status hierarchy, using the best information available.

The results in Table 12 lend support to the hypothesis that researchers earlier in their career appear to be more likely to publish quantitative work. The most significant difference is between

Table 11 Quantitative Articles, by Number of Authors

		NOT QUANTITATIVE	QUANTITATIVE	TOTAL
Single author	Freq.	253	342	595
	Percent	42.5	57.5	
Two authors	Freq.	19	109	128
	Percent	14.8	85.2	
Three or more authors	Freq.	7	49	56
	Percent	12.5	87.5	
Total	Freq.	279	500	779
	Percent	35.8	64.2	

Table 12 Quantitative Articles by First Author Status (Based on the U.S. Academic Status System)

		NOT QUANTITATIVE	QUANTITATIVE	TOTAL
Professor or equivalent	Freq.	133	156	289
	Percent	46.0	54.0	
Associate professor or equivalent	Freq.	61	119	180
	Percent	33.9	66.1	
Assistant professor or equivalent	Freq.	49	120	169
	Percent	29.0	71.0	
Instructor or post-doctoral fellow	Freq.	9	23	32
	Percent	28.1	71.9	
Non-faculty (non-academic, pure research position, library, archive)	Freq.	22	50	72
	Percent	30.6	69.4	
Student	Freq.	5	32	37
	Percent	13.5	86.5	
Total	Freq.	279	500	779
	Percent	35.8	64.2	

the senior writers (U.S. full professors) and students; others lie roughly in the middle. That finding is interesting on its own but difficult to interpret without taking time into account. Many of the authors who were students or junior faculty at the beginning of the journal's history have passed through the academic ranks by now (many are retired, and some have died). Did the later senior faculty give up their quantitative ways? Some of the answer is in Table 13, which reports the distribution by decade (combining all the non-teaching ranks because of their small numbers). The table generally confirms that full professors were less likely to publish quantitative articles than were all the other academic ranks, even in the 2010s, when full professors were more likely to do so than previously, and everyone else was, too.

INTO THE FUTURE: BIG DATA AND THE NEW DIGITAL HISTORY The world of interdisciplinary history and its quantitative elements have changed continuously over the nearly fifty years of the *JIH*'s existence. New approaches continue to emerge, and the journal continues to both welcome and encourage them. Two fairly new developments are worth notice. The first is the emergence of "big data," reflecting the availability of huge data sets that number in the tens or hundreds of millions of data items and are often

Table 13 Quantitative Articles by First Author Status and Decade (Based on the U.S. Academic Status System)

		PROFESSOR OR EQUIVALENT		ASSOCIATE OR EQUIVALENT		ASSISTANT OR EQUIVALENT		ALL OTHER	
		NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE	NOT QUANT.	QUANTITATIVE
1970s	Freq.	19	21	13	25	17	38	14	24
	Percent	47.5	52.5	34.2	65.8	30.9	69.1	36.8	63.2
1980s	Freq.	36	48	12	35	8	28	7	24
	Percent	42.9	57.1	25.5	74.5	22.2	77.8	22.6	77.4
1990s	Freq.	33	27	13	24	14	29	4	13
	Percent	55.0	45.0	35.1	64.9	32.6	67.4	23.5	76.5
2000s	Freq.	29	30	18	14	5	13	5	11
	Percent	49.2	50.8	56.2	43.8	27.8	72.2	31.3	68.8
2010s	Freq.	16	30	5	21	5	12	6	33
	Percent	34.8	65.2	19.2	80.8	29.4	70.6	15.4	84.6

based on information drawn from full-count censuses, financial or other business transactions, or environmental data with a high spatial or temporal resolution. Recent articles about the role of big data in demographic analysis and in economic history set the stage for what is to come. In the case of the *JIH*, it is instantiated, especially in modern climate data, which by definition is comprised of numerous observations, many of them recorded nearly continuously, or with other environmental data, such as those about soils, terrestrial elevations, or remotely sensed satellite imagery, which are often recorded in a highly resolved grid. Recently released full-count historical U.S. census data constitute another source of high-resolution data; the publicly available digital version of the 1940 census contains information about 134 million individuals.

The exceptionally large data sets that come close to representing the universe of potential observations obviate the need for inferential statistics based on a sample. Every research adventure is a descriptive statistical problem, and indicators like statistical significance have questionable value. The research community is still trying to reckon with the implications of big data for the future.[16]

Another promising avenue of innovation in historical research is based on the new capacity to analyze large data collections, and new strategies for thinking about historical problems under the rubric of "digital humanities" or "digital history." These new approaches involve analyzing the composition of potential new sources—books, journals, magazine, and especially newspapers—or looking anew at historical problems, such as the idea of a qualitative approach to geographical information systems. Content of this sort has recently started to appear in the journal, most notably in Atkinson and Gregory's article in volume XLVIII.[17]

Much of the data analysis in the history of the *JIH* has had its intellectual origins in the social sciences, but the success of the journal derives in good measure from its success at showcasing

16 See Steven Ruggles, "Big Microdata for Population Research," *Demography*, LI (2014), 287–297; Gutmann, Emily Klancher Merchant, and Evan Roberts, "'Big Data' in Economic History," *Journal of Economic History*, LXXVIII (2018), 268–299.

17 For recent progress in this field, see Susan Schreibman et al. (eds.), *A New Companion to Digital Humanities* (Chichester, 2016); for new approaches to spatial analysis, Jeremy M. Mikecz, "Peering Beyond the Imperial Gaze: Using Digital Tools to Construct a Spatial History of Conquest," *International Journal of Humanities and Arts Computing*, XI (2017), 39–54; for *JIH* content, Paul Atkinson and Gregory, "Child Welfare in Victorian Newspapers: Corpus-Based Discourse Analysis," *JIH*, XLVIII (2017), 159–186.

interdisciplinary approaches to music, religion, or the visual arts alongside important historical questions. Relatively few of the older humanistic interdisciplinary articles made use of large-scale data or quantitative strategies. What makes the newly emergent areas of interdisciplinary inquiry exciting is their ability to broaden quantitative methods to enfold the humanities and more of the natural sciences, and to find ways to create interdisciplinary connections that span all of them at once.

From its very beginnings, the *JIH* published articles that embraced quantitative methods, but in its effort to engage as many disciplines as possible, it did much more. Over the nearly fifty years of its publishing history, it has continued to publish variegated interdisciplinary material and, in the process, to present leading-edge research. All the while, quantitative methods have both changed and stayed the same, just as interest in quantitative approaches to historical research has diminished, especially in the United States and Canada.

Much of the dynamic in quantitative historical research has been a function of changing technology, as computers increased in their capacity and speed, and software for managing and analyzing data became ever-more sophisticated. Despite those improvements, this article's analysis of forty-nine years of *JIH* articles makes two striking discoveries: (1) that most of the quantitative methods represented in the journal are uncomplicated ways of presenting data that describe what researchers learned from the core elements of their sources and (2) that quantitative approaches are generally the domain of researchers who are still building their careers, not those who are the most established. The steady pace of articles with descriptive tables, graphs, and maps has persisted, but the proportion of articles that employed sophisticated statistics, especially regression-type analysis began to decline in the 2000s after a sustained increase from the 1970s through the 2000s.

The 2010s were a transformative time for the journal, marking more than just the end of the trends just described. Material from the United States and Canada dwindled while that from Europe escalated, often with two, three, or more authors. At the same time, the drift of its subject matter away from the journal's traditional areas of interest toward, among other themes, long-term climate trends and their historical context signaled a

new direction for interdisciplinary history, embedding it within a global intellectual network founded on quantitative approaches.

The journal has a new role in a much more international context. The emergence of new quantitative methods has permitted the *JIH* to redefine interdisciplinarity. Immense data sets, with modes of interpretation drawn from the social sciences as well as from the humanities, natural sciences, and medicine, will certainly continue to revolutionize future research. The opportunities are enormous, beyond quantification.