

APPROACHES TO SOCIAL SCIENCE HISTORY:
QUANTIFICATION IN THE CLASSROOM

Charles Stephenson
The Newberry Library

The publication in 1974 of Time on the Cross¹ was heralded by the academic community with statements such as economist Peter Passell's:

If a more important book about American history has been published in the last decade, I don't know about it. [This book, he concluded] with one stroke turned around a whole field of interpretation and exposed the frailty of history done without science.²

Historian Stephan Thernstrom called the book "a remarkable achievement," indeed "absolutely stunning, quite simply the most exciting and provocative book I've read in years."³ The book clearly has been provocative. Yet we find today that what began as an aggressive action against "traditional" history now has turned back on itself. Time magazine, whose reviewer praised the book when it was first published, has now publicly reevaluated the book⁴ and the re-reviewer for the New York Review of Books, which has joined in that re-estimation, has said that Fogel and Engerman now "must prove before any of their particular contentions, that their book even merits further scholarly attention."⁵ The result, by and large, has been a rather gleeful acceptance by conventional historians of all the bloodletting over this once-miraculous, Bancroft prize winner.⁶ Such a reaction may be understandable, but it does miss the point that those most critical of the work have been those same quantifiers whose pursuits were invoked by Fogel and Engerman in the beginning.⁷

Be that as it may, the controversy concerning Time on the Cross has had the effect not only of stirring up the waters of history, but probably also has reconfirmed the resolve of those on all levels who are not quantifiers not to become quantifiers! Surely this is a detrimental result, particularly since it has come to a point at which this methodology was being accepted for what it is--no miracle worker, but a useful and sometimes crucial tool.

When we deal with the entire question of quantification in today's history profession we really are dealing with more than the simple use of numbers or statistical tests or computers. Therefore, we might profitably employ the somewhat less "loaded" term "social science history" more or less interchangeably with "quantification." Quantification, after all, is only one facet applied by those who seek to bring the process and discipline of social science to bear on historical study. From this perspective let us note a primary characteristic of social science history which is of immediate concern to us here, and realize that social science history and quantification are, in large part, ways of making explicit what previously has been implicit in our work. Historians have been criticized, and justly so, for beginning and ending too many studies with vague or confused hypotheses. We have seen far too many cases in which scholarly foundations, when drawn-out in detail and then tested, have failed to support the weight of the evidence. And until they are tested, and that means put in a testable form, we cannot be sure of their validity. Certainly, there are insights which cannot be verified by quantitative means--more often, however, the opposite is the case. Good examples of the type of quantitatively based generalizations historians make (often unconsciously) have been pointed out

in many places. Fogel, for example, has made reference to a statement from George Soule's Economic Forces in American History to support this point:

Regional concentration of industries and specialized crops, though dependent on many factors, could not have developed so fully without railroad transportation. New England could find national markets for its textiles and shoes. Pennsylvania with its coal and easy access to iron, could concentrate on basic iron and steel, shipping the products wherever they might be wanted. Iowa could, with its specially adopted soils and climate, become a corn and hog country.⁸

As Fogel would contend, this implicit measurement is subject to explicit testing.⁹ Indeed, economic historians were among the leaders in the profession in adopting quantitative methodology, in part because economic data so easily lends itself to statistical approaches. The fact is, however, that historians in other fields use terms of quantity just as often, yet put them in testable form with considerably less frequency. Take, for example, the vast literature in political history which for years projected untested hypotheses. We had been told, for example, that the impact of "Jacksonian Democracy" upon the political structure of the United States not only rendered it infinitely more open, but also that, for the first time in America, people began to participate in politics in significantly large numbers. These assertions were at base quantitative--and therefore quantifiable--ones. What were measures implicit in these interpretations?--Who voted? How many voted before Jackson's election? Were there identifiable extraneous causes for any change in participation? When we did put these hypotheses in testable form and subjected them to verifiable procedures, we found rather different facts than we had been led to expect.¹⁰

Let me offer a further example from an area in which I am now doing research, and one of which most historians have heard a great deal in recent years, the questions of geographic and social mobility. The question of "success" and the question of movement have been mainstays of the profession since even before Frederick Jackson Turner. Most of us are familiar with the age-old image of American achievement, the "rags to riches" stories typified by the Horatio Alger genre. While most of us recognize it as crude and overdrawn, nonetheless we have long maintained a related image--the one, in fact, that Ragged Dick and Newsboy Tom really exemplified--that of moderate success and advancement achieved through hard work and dedication. That image has been found wanting through the application of the methods of social science history. First, assumptions were made explicit: if people achieved something, what was it they achieved?--higher wages, higher status, more property, greater authority? If they "achieved," that is, advanced from one place to another, from where did they start, where did they go, and what happened to them in between? Before we can deal with these questions we have to know something about comparative wage rates; we have to be able to rank occupations in some order and decide what constitutes "vertical," rather than "horizontal," movement; we have to know something about property holding and income, and many other similar things, which are all quantitative measures. Finally, we have to know all this information not about one person or even one hundred, but about a great many people--thousands, in fact.¹¹

Sociologists have dealt for many years with these questions of social and occupational mobility, but, when historians began to investigate them, they confronted still another problem. In attempting to find people in the past in two different sets of records (to place them at two different times), they discovered that over a period of a decade or so many, and often most, of the people they were trying to analyze had disappeared from the records, most of them because they moved away from the place where they first were found. Until recently, indeed until the project we are now working on at the Newberry

Library, we had no reliable means to trace these people over large distances to another place.¹² We had a great deal of aggregate statistics, but no way to bring them down to a "human level."

Let me briefly mention some of the things that historians working in these areas have concluded. First, the assumptions concerning social mobility have been called into question. Social and occupational movement never was as great as some have recorded--certainly never the classic "rags to riches" cases. Secondly, we have demonstrated that, in an overall sense, those who have shared in the personal rewards of a growing national industrial structure have been members of very distinct national, ethnic, and religious groups. We have found higher rates of geographic mobility than we expected, and we still are analyzing who moved and why, but clearly spatial movement was not necessarily correlated with automatic economic advancement.

There are similar examples which we might use from many fields of historical study--and undoubtedly more will follow--but these few are sufficient to make a point regarding the usefulness of the social science history approach. The question which arises from all of this is, what effect does, can, or should all this have in the history classroom? Surely, it seems that not only is a great deal of effort, a great investment of time and money, required to carry out these studies, but that the mathematical sophistication required to deal with them extends not only beyond that which might reasonably be expected or demanded from students (especially non-majors), but, indeed, from most history teachers. The reply to all of these questions is, yes and no, and several points must be made regarding them.

To begin with, an increasing mathematical sophistication is required of all students today. Math and statistics are the basis of a growing proportion of human knowledge, and mathematic thought is becoming increasingly useful and basic to fields as diverse as anthropology and child development. While I began this discussion by emphasizing that quantification was only one of the tools in a historian's collection, I also must say in all honesty that I believe it is an indispensable one. The generation of historians who now are in high school and college will have to be able to read, and to interpret, and to write, and to quantify if history as a profession is to make any pretense at sharing and understanding the many exciting discoveries in all the other social sciences. Having said that, however, let us be practical again, and forthrightly say that while a great deal of sophistication is to be desired, it is not an indispensable necessity in order to use a quantitative approach as a tool for teaching history using statistics, computers, and models. Let me suggest an approach based on the research mentioned above.

Obviously in order to create a far-ranging study of social or geographic mobility, or of urban structure, or of voting behavior, we need to have thousands of names (we cannot generalize from the experience of one person, or even of one historian!), expensive key-punching, many computer runs, and analysis in depth. But to use such a study as a teaching exercise we would need only a fraction of this. How could we go about such a study?¹³ In a class of twenty or twenty-five students, for example, we could study the ethnic or occupational structure of our town or our county one hundred years ago. We might decide that each student could, according to a pre-arranged plan (sampling scheme), spend a couple of hours recording fifty families from the 1870 or 1880 federal census for the city. Then with the investment of another few hours, we could translate the information we have on these families to analyzable statistics, have them key punched, run them through a computer, and analyze them. Sound complicated? Not at all--let's take it a step at a time.

First, federal censuses on microfilm are easy to obtain. In most cases, a local library has them in its collection. If not, they can be borrowed

from the nearest regional branch of the National Archives.¹⁴ If all else fails (or if the school has a healthy budget or the class can get a half dollar from each student), reels can be purchased from the National Archives in Washington for \$12.00 each, and no more than one or two reels should be required.¹⁵ The census is a straight-forward list of names and other information--occupation, place of birth, in some cases value of personal and real estate. There are plenty of guides available to help organize the information.¹⁶ Next, spending a day or two with a text book on statistical methods, and asking perhaps a question or two of a math, economics, or business teacher, will prepare the instructor to devise a sampling scheme, if sampling is desired.¹⁷ After all the information is recorded, converting it into machine-readable form will again be found to be a straight-forward operation, or the class may wish to trace to another census the families they have sampled.¹⁸ Key-punching this information directly onto data cards is next, and volunteers from the community often will help with this chore. If not, the class will soon learn that key-punching by the hunt-and-peck approach is no more difficult than typing by that venerable method. The last step is probably the most complex--getting a computer to use--but I daresay it is not insurmountable in any school. Chances are that the school district already buys time on a computer for its payroll, or for its enrollment projections, or to find out how many teachers it seeks to drop next year. If not, rental of a terminal to hook up by a simple telephone call to a computer at the nearest university is usually easy to arrange. In this last case, in particular, a computer package will be available which will make the use of the computer almost effortless.¹⁹

You have now done everything but analyze your print-out. This, too, can be handled with a moderate investment of time.²⁰ After all this has been done, it is easy to break the data down into separate units so they can be compared. Suppose, however, that you do not wish to be misled in drawing your own samples. There are data archives which have, ready to send to your computer center, sets of data, with full explanation, that are ready to use. Indeed, in the field of political science and sociology, teaching packages have been adopted which easily could be converted for use by historians. Other approaches, through computer-aided-instruction (CAI), involve very simple games and computer simulations in which the greatest skill required is the above mentioned ability to type by the hunt-and-peck approach.²¹

There is no way, really, to introduce these topics in any depth in a paper of this length. What I have tried to do is to present briefly enough information to tantalize the curious, to interest the negative, and perhaps even to convert the wavering. Yet I am sure that even the straight-forward fashion in which I have presented the research design in this paper will find many historians unsure of their own ability to undertake quantitative research in the classroom. It should be clear that I do not take the approach to these matters lightly.

I was asked recently to comment on a proposal made to the American Historical Association to develop and disseminate quantitative teaching packages for classroom use.²² My initial reaction to the proposal was somewhat negative. I was disturbed by the prospect of instructors who were unskilled and probably opposed to the approach utilized by these packages, and I could foresee the very negative results which could result from such a situation. Such a prospect still disturbs me. Yet I believe the enthusiasm with which some classroom teachers are seeking to introduce students to the varieties of methods in history can serve to vitiate the problem in many cases. While I do believe that the primary need is for more history teachers skilled in these areas, I also believe that a teacher willing to invest the effort can approach successfully these questions in the classroom. I am aware, first, of how very much effort is involved in acquiring the sophistication which the field deserves, but I also know that the approach can be basic and still be usable, beneficial, and enlightening.

There are programs which offer training in the skills of social science history to college teachers--the best known are the summer programs at the Newberry Library and at the University of Michigan--and I am hopeful that a similar program for interested teachers on the high school and junior college level will soon be established.²³ However, I can assure you that any history teacher who wants to acquire the level of skills necessary to organize the type of project discussed above, and who enters the area with a positive attitude, can do so, and do so short of taking a semester off to retool.²⁴ The effort involved to achieve this basic but usable level of skills in social science history, I would suggest, is approximately that involved in organizing carefully a new course to be offered next year, in producing a play on stage, or in setting up a campus newspaper. The knowledge is not free, but neither does its acquisition present to the conscientious historian obstacles which are not worth the effort to surmount. The primary thing about which a teacher constantly must be aware is the limitations of one's own knowledge. Given that, I believe the future of quantification as a tool for teaching history is unlimited.

NOTES

¹Robert William Fogel and Stanley L. Engerman, Time on the Cross (two volumes--Vol. I, The Economics of American Negro Slavery; Vol. II, Evidence and Methods--Boston, 1974).

²Cited in Thomas L. Haskell, "The True and Magical History of 'Time on the Cross,'" New York Review of Books, (October 2, 1975), 33.

³Cited ibid.

⁴Ibid.

⁵Ibid.

⁶The work shared the 1975 Bancroft prize with Eugene Genovese's Roll, Jordan, Roll: The World the Slaves Made (New York, 1975).

⁷Fogel and Engerman have countered not only by defending their evidence, but by saying that the work is no more than an interim report on a research project currently in progress.

⁸Robert William Fogel, "The Limits of Quantitative Methods in History," American Historical Review, LXXX (April, 1975), 330.

⁹"The 'regional concentration' referred to in the first sentence can only be defined in quantitative terms; the phrase implies the existence of a measure of the spatial distribution of productive actuality. The sentence as a whole implies that the difference between the cost of transportation by railroad and the next most favorable medium was of such a magnitude that the absence of the railroad would have reduced regional concentration by a detectable, and therefore measureable, amount. Indeed the sentence implies that such a measurement has in fact been performed. The term 'national market' in the second sentence, if it is to have anything but a trivial meaning, implies that the amount of shoes and cotton goods sold by various firms beyond some region specified as local was large relative to total output. The only significant economic interpretation of the phrase 'easy access' (third sentence) is that the cost of obtaining ore in Pennsylvania was lower than in other designated areas. The statement that Pennsylvania concentrated on the production of basic iron and steel implies a system by which the amounts of the qualitatively different products of the state can be aggregated and against which the state's production of iron and steel products can be measured.

Finally the statement that Iowa's soil and climate were 'specially adapted' to corn production (fourth sentence) presumes the existence of a measureable relationship between corn yields on the one hand and rainfall, temperature, and various soil properties on the other." Ibid., 330-331.

¹⁰For a good introduction to literature on the Jacksonian period, see especially Edward Pessen, Jacksonian America: People, Personality and Politics (Homewood, Ill., 1970).

¹¹For general introductions to the historical study of mobility, see especially Stephan Thernstrom, The Other Bostonians: Poverty and Progress in an American City (Cambridge, Mass., 1973), especially his conclusion; Thernstrom and Richard Sennett (eds.), Nineteenth Century Cities: Essays in the New Urban History (New Haven, 1969); and Charles Stephenson, "The Cultural Context of Social Change: Social Mobility and the Contours of Community in America" (forthcoming). For information regarding occupational classification, see Michael B. Katz, "Occupational Classification in History," Journal of Interdisciplinary History, III (Summer, 1972), 63-88; Clyde Griffen, "Occupational Mobility in Nineteenth Century America: Problems and Possibilities," Journal of Social History, V (Spring, 1972), 310-330; Theodore Hershberg et al., "Occupation and Ethnicity in Five Nineteenth Century Cities," Historical Methods Newsletter, VII (June, 1974), 174-216; Thomas Smith, "Reconstructing Occupational Structure: The Case of the Ambiguous Artisans," ibid., VIII (June, 1975), 134-145; Thernstrom, The Other Bostonians, Appendix B: "On the Socio-Economic Ranking of Occupations," 289-302. For general introductions to the current state of quantification, see especially Richard Jensen, "Quantitative American Studies: The State of the Art," American Quarterly, XXVI (Fall, 1974), 225-240; Jerome Clubb and Howard Allen, "Computers and Historical Studies," Journal of American History, LIV (December, 1967), 599-607; Clubb, Erick W. Austin, and Michael W. Traugott, Computers in History and Political Science (White Plains, New York, 1972 [an IBM Publication available from that Company]); Robert P. Swierenga, "Clio and Computers: A Survey of Computerized Research in History," Computers and the Humanities, V (September, 1970), 1-21; and Swierenga, "Quantification in American History," Journal of American History, LXIII (March, 1974), 1045-1070.

¹²For information on tracing people in history, see especially Charles Stephenson, "Tracing Those Who Left: Mobility Studies and the Soundex Indexes to the U.S. Census," Journal of Urban History, I (November, 1974), 73-84; Stephenson, "The Methodology of Historical Census Record Linkage: A User's Guide to the Soundex," forthcoming in The Family in Historical Perspective: An International Newsletter; and Stephenson, "Determinants of American Migration: Methods and Models in Mobility Research," Journal of American Studies, IX (1975), 189-197. The Newberry Project, "Social Predictors of American Mobility, 1875-1915," is supported by the Metropolitan Center of the National Institute of Mental Health (MH 256860-02).

¹³The best short introduction to the entire process of quantitative research design is Edward Shorter, The Historian and the Computer: A Practical Guide (New York, 1975).

¹⁴Archives Branches are in the following cities: Boston (mailing address, Waltham), New York (Bayonne, N.J.), Philadelphia, Chicago, Atlanta (East Point), Kansas City, Fort Worth, Denver, Los Angeles (Laguna Niguel), San Francisco (San Bruno), and Seattle.

¹⁵For information on purchasing census microfilms, see Federal Population Censuses, 1790-1890: A Catalog of Microfilm Copies of the Schedules (Washington, D.C., 1972).

¹⁶Shorter, The Historian and the Computer, is the most helpful place to begin with the entire operation, so I shall not cite him in specific cases.

¹⁷Essentially, sampling is a statistical method by which one may, within certain limits, obtain a reliable picture of an entity by taking only a "few" members of it. A desirable size for a reliable sample (properly drawn) is about a thousand (individuals, families, or whatever). Fewer may be used for instructional purposes as long as those using them are aware of the inherent representational limitations. See, for example, "Sampling," Part 5 in Hubert M. Blalock, Social Statistics (second edition, New York, 1972), 509-532.

¹⁸See Stephenson, "Tracing Those Who Left."

¹⁹One very useable computer package is the Statistical Package for the Social Sciences (SPSS). See Norman H. Nie, et al., SPSS Manual (second edition, New York 1975), and the shorter version, William R. Klecka, Norman H. Nie, and C. Hadlai Hull, SPSS Primer (New York, 1975).

²⁰The SPSS Manual will be of great help in analyzing the printout.

²¹For data archives, see especially A Guide to Resources and Services (Ann Arbor, 1975) from the Inter-University Consortium for Political Research (ICPR), the major repository for social science data. For packaged teaching units, see, for example, the SETUPS (Supplementary Empirical Teaching Units in Political Science) series from ICPR and the American Political Science Association, including such units as Christopher Arterton and Harlan Halin, Political Participation, Paul Allen Beck, Jere W. Bruner, and L. Douglas Dobson, Political Socialization Across the Generations, Herbert B. Asher and Bradley Richardson, Comparative Voting Behavior, and John Paul Ryan and C. Neal Tate, The Supreme Court in American Politics: Policy Through Law; and units from the Laboratory for Political Research at the University of Iowa (see John G. Kolp, "Data Analysis in the History Classroom: The Instructional Nominal Approach," [a paper presented at the 1974 American Historical Association Convention], including Kolp's The American Frontier, 1850-1880, (Iowa City, 1972), and Instructional Manuals from the Social Science Curriculum Project (Iowa City, 1973). For an approach to a semester-long course, see Michael P. Weber, "Quantification and the Teaching of American Urban History," The History Teacher, VIII (May, 1975), 391-402. For information on computer aided instruction (including computer simulation), see John M. Allswang, "The Computer as a Teaching Tool for Undergraduate History Instruction" (a paper presented to the 1975 Organization of American Historians Convention); and various papers by Charles M. Dollar (such as "A Preliminary Report on Computer Assisted Learning in American History Courses at Oklahoma State University," an unpublished paper), who now is Director of the Machine-Readable Archives Division of the National Archives.

²²The proposal was submitted to the AHA by John Allswang of California State University, Los Angeles.

²³For information on these courses contact the Summer Institute in Historical Methodology, Family and Community History Center, the Newberry Library, Chicago; and Summer Program, Inter-University Consortium for Political Research, University of Michigan, Ann Arbor.

²⁴After consulting Shorter, see especially Charles M. Dollar and Richard J. Jensen, Historians' Guide to Statistics: Quantitative Analysis and Historical Research (second edition, New York, 1975); Roderick Floud, Quantitative Methods for Historians (Princeton, 1974); and Blalock, Social Statistics.