

The Late Robert M. Hartwell "Chinese Historical Studies, Ltd." Software Project

Peter Bol

Harvard University and the Electronic Cultural Atlas Initiative, USA

From the beginning of his career at the University of Chicago and continuing during his tenure at professor of Chinese history at the University of Pennsylvania and into his retirement in Wyoming, the late Robert M. Hartwell was intensely concerned with the study of social and economic change in Chinese history. Working mainly with middle-period sources (mid-Tang into Yuan), he produced a number of unusually helpful research aids¹ and a series of influential research articles.² Readers of Hartwell's work will immediately notice that his research involved the citation of an unusually large number of sources on any given point and the collection of a considerable body of supporting data. Hartwell preferred to rely upon the preponderance of evidence; he rarely argued from the isolated example. He was in fact devoted to the collection of large sets of data and, finding a lack of this kind of research in the scholarly literature, he set out to create a body of extensive data sets himself. By the mid-1970s he had defined a program to amass the most extensive prosopographical data set ever created for the study of Chinese history for any period, and he continued his work with the help of students and especially his wife and collaborator Marianne Carlson Hartwell until

¹ *A Guide to Sources of Chinese Economic History, A.D.618-1368*. Chicago: University of Chicago, 1964. 257 p. *Tribute Missions to China, 960-1126*. Philadelphia: by the author, 1983. 215 p. "A Guide to Documentary Sources of Middle Period Chinese History: Documentary Forms Contained in the Collected Papers (*wen-chi*) of Twenty-one T'ang and Sung Writers." *Bulletin of Sung-Yuan Studies* 18 (1986): 133-182. Although never published, copies of Hartwell's introduction to middle-period historical sources circulated in the field.

² Some of the most widely cited articles, which also indicate his ability to range from fiscal to intellectual to social history, are "Markets, Technology, and the Structure of Enterprise in the Development of the Eleventh-Century Chinese Iron and Steel Industry," *Journal of Economic History* 26 (1966): 29-58. "A Cycle of Economic Change in Imperial China: Coal and Iron in Northeast China, 750-1350," *JESHO* 10.1 (1967): 101-59. "The Evolution of the Northern Sung Monetary System," *Journal of the American Oriental Society* 87.3 (1967): 102-59. "Historical Analogism, Public Policy and Social Science in Eleventh and Twelfth Century China," *American Historical Review* 76 (1971): 690-727. "Demographic, Political, and Social Transformation of China, 750-1550," *Harvard Journal of Asiatic Studies* 42.2 (1982): 365-442.

his untimely death in 1995. In the early 1990s he began to turn his attention to the preparation of his data for scholarly use. For a period he created an advisory committee, which I chaired, to whose members he made available copies of his data sets and applications, and he eventually he incorporated as "Chinese Historical Studies, Ltd."

At the time of Hartwell's death the project included multi-variant biographical and genealogical data for over 25,000 individuals, a bibliographic database of over 4500 titles, and multiple geo-referenced objects and features. I believe that the number of individuals included by name and kin connection but without further biographical detail was on the order of 60,000. The bulk of data pertain to the middle-period in Chinese history (8th-15th centuries), in particular the Song dynasty (960-1279). Here I want to sketch out what Hartwell did accomplish, describe what he envisioned in the long term, inform you of what is now being done to make his work available to scholars, and invite a discussion of the ways in which its value might be increased. I have used his software – it works – and I have looked carefully at specific instances to examine the quality of his data collection. However, the examples you will see are from pages in the guide to the software applications which Hartwell produced. At the moment the estate is still in probate court.

The Premise

Hartwell's aim was to take advantage of precisely those kinds of reliable data that the Chinese historical record provides in such abundance: the chronologically organized biographies of individuals who served in government created for public (e.g. state historiographical records) and private (funerary inscriptions) purposes. Individuals can be situated in a variety of contexts: as natives or residents of central places or administrative units, in bureaucratic ranks and offices, and in kinship networks. The greater the number of individual accounts we can include, the more extensive the family tree we can reconstruct, the better we can trace kinship networks and marriage alliances. We can shift our perspective from person to place and ask how a particular place fared in terms of its ability to produce degree holders and higher office holders over time. We can correlate the writings that were produced by men of a certain time and place. There is much more that might be done, of course, but it is important to keep in mind that Hartwell was interested in seeing the larger national picture and creating a series of data sets and applications that users could add to. It is fair to say that the publication of Chang Bide et al, *Index to Song Biographical Materials*, in 1974-1976, and Wang Deyi et al,

Index to Yuan Biographical Materials, in 1979-1982, were essential to Hartwell's achievement.³

The Applications

A survey of the interface screens will introduce the electronic data sets and software applications for medieval Chinese studies Hartwell built. I should add – because it will not be apparent – that Chinese characters are included in the data sets. We begin with the Main Menu (screen #3).

Each menu item leads to another menu screen. We turn now to the basic biography.

Assuming that information exists the basic biography will allow one to call up information in more and less detail. An employment summary or list of dated offices and activities; extant publications, non-kinship associations, and the documentation used for this entry. Of special interest are the agnatic and affinal kin options. In both cases one has a choice between a quick list of randomly arranged kinship relations of the selected individual lineage and between a chronological list of members of the lineage with the CV of each person. Items J-N above lead to further screens for inputting data. This does require historical knowledge. In entering data one must attach an individual to an existing lineage ID # or create a new lineage number. As the next screen illustrates there are utilities to help one do this.

Returning to the Main Menu (Screen #3) I shall only note briefly a few possibilities for Political Analysis and Kinship Analysis. With the former one can recover the incumbents in certain offices over user-defined periods of time, which in turn allows for a regional analysis and, by tracking non-kin affiliations, a political factional or coalition analysis (which can also be analyzed regionally). The Kinship Analysis allows one to reconstruct the mourning circle of a particular individual, which in turn provides a cohort in which to explore affinal networks, non-kin affiliations, and so on.

³ 昌彼得等編《宋人傳記資料索引》8 vols., 王德毅等編《元人傳記資料索引》5 vols. Hartwell did not live long enough to make use of two works from Sichuan University, Li Guoling's three volume addendum to the Song index and Shen Zhihong and Wang Ronggui four volume index to biographies of Song figures in local histories: 李國玲編《宋人傳記資料索引補編》, 1994, 3 vols.; and 沈治宏 王蓉貴編《中國地方誌宋代人物資料索引》1997, 4 vols.

Of considerably more complexity is the Regional Analysis promised in Item B, which in turn has bearing on "Economic History," Items I-M. let us examine first the general plan. The Main Menu for Regional Analysis, Screen # 5, is as follows.

Some of this is obvious – *jinsi* geography for example allows one to plot the regional distribution of *jinsi* degree holders over time; lineage geography allows one to follow the migrations and/or residences of members of the same lineage. Marriage geography allows for locating the marriage partners of a family unit, lineage, or local elite cohort in time and space.

Migration Geography, here on Screen # 5a, in fact gives a variety of choices for mapping migration, Screen # 5b.

Some examples follow (appended):

Figure 1: Inter-Prefectural migrations for one selected period – a map of Song China with migrations plotted for moves between all prefectures during a selected period of years.

Figure 5: Intra-Province migrations for one selected period, with the unit in this case being the modern province.

Figure 10: Intra-Circuit (*lu*) migrations – split screen maps for four, user-defined periods

Now we know, and Hartwell knew too, that administrative boundaries and even central places were not constant in Chinese history. The geo-referencing of historical information would not be problematic if it remained nominal; that is, if it referred to a table of names of administrative units and central places in use at the time. However, once he decided to generate a map of the data Hartwell faced a choice. He could co-locate earlier place names on a modern county map such as the digital boundary map of the 1990 counties and, for the sake of simplicity act as if county boundaries were constant. In fact Hartwell was working on exactly this. But administrative change – the subdivision, aggregation, and renaming of counties was ongoing. Thus for every county he needed a file of the county history (the research for the creation of these files was itself no small matter) and he needed a series of maps that would show what existed at any one moment. Ultimately he concluded that county (or at least prefectural) boundaries would have to be reconstructed. He promised a series of maps covering the period AD 741-1948.

Long Term Aims

The reconstruction of historical boundaries is crucial to the creation of an historical GIS. Given the wealth of local historical data – for much of the southern half of China this becomes rich and cumulative in the twelfth century and in much of the northern half two centuries later – it seems to me absolutely essential that Hartwell's task be pursued to completion. The problems are legion. Is it realistic to think that we can reconstruct county boundaries or should we opt instead for central places? How accurate are the prefectural boundaries as depicted in the various historical atlases?

But if we assume that we can establish digital historical maps down to the county level, then there is a flood of historical data that can be geo-referenced. Hartwell himself was committed to at least including the population statistics found in Song sources. He was interested in the possibilities for plotting transportation networks and hydrology, for schools and religious

establishments. Local gazetteers are of course filled with more and less reliable information. Despite what it may seem Hartwell was not interested in what he called "data-dredging," he had his eye on the prospects for analysis.

He was anxious to build in various utilities – such an automatic conversion between the solar and lunar calendar, the automatic conversion of reign dates, etc. – and he wanted to find ways that others could contribute to the larger data set. Around this time seeing what he was doing led me to include the compilation of electronic data sets as I pursued my own interests in local cultural history.⁴

Prospects

Hartwell never doubted the importance of his work, but he was continually frustrated by the failure of the rest of us to devote as much attention to it as he did and to provide the appropriate level of financial support. Prior to his retirement from the University of Pennsylvania he had formed an advisory committee to test and comment on the database and applications. After incorporating in Wyoming as "Chinese Historical Studies, Ltd." Hartwell

⁴My work on Wuzhou 婺州 /Jinhuafu 金華府 from Song through Ming has to date resulted in data sets with 1370 biographies, 1309 building events and related inscriptional materials for public, private, and religious sites, 1460 titles of extant and non-extant books by Wuzhou authors, 840 jinshi degree holders, 800 juren, 340 non-degree holding officials from the area, referenced names of about 4000 other local figures, a chronology of local events, and a variety of other tables. Much of this information can be geo-referenced, much of it at the *xiang* and even village level. Some of the research using this data is now appearing: "Intellectual Culture in Wuzhou ca. 1200 -- Finding a Place for Pan Zimu and the *Complete Source for Composition*," Proceeding of the Second Symposium on Sung History (Taipei, 1996), pp. 788-738. "Local History? Geography, History, and Culture in Southern Song and Yuan Wuzhou," forthcoming conference volume on Song dynasty historiography, edited by Thomas H.C. Lee and Conrad Schirokauer. "Zhang Ruyu, the *Qunshu kaosuo*, and Diversity in Intellectual Culture -- Evidence from Dongyang County in Wuzhou," 慶祝鄧廣銘教授九十華誕論文集 Essays in Honor of the Ninetieth Birthday of Professor Deng Guangming (Shijiazhuang: Hebei jiaoyu chubanshe, 1997), 644-73. "Neo-Confucianism as Position, Identity, and Movement in Local Society," for conference volume for the ACLS Conference on the Song-Yuan-Ming Transition, Lake Arrowhead, California, June 5-12, 1997, edited by Paul Smith and Richard von Glahn. "Su Shi in Southern Song Wuzhou: A Study of Private Publishing and Intellectual Culture in Local Society." *Gest Library Journal*, forthcoming.

was making arrangement with the China Data Center at the University of Michigan, which had become home to material from the China In Time and Space (CITAS) project, to provide Michigan with his digital maps in return for a certain sum. He died before finishing the work and at this point Marianne Carlson Hartwell apparently ceased her work on the project. She died a year later.

The Hartwells had willed their estate to the Harvard-Yenching Institute, in the conviction that Harvard would see to the preservation and dissemination of their research. Assuming this outcome, we may address the question of what should happen. Hartwell's project is unfinished in two regards: the boundary files are almost certainly incomplete and the final version of his applications is still untested. To stimulate discussion let me propose several possibilities. First, the minimal action we can take is to make the data sets and non-GIS applications available in a form that is suitable to users. This can be distributed in a CD ROM version at very little cost but it will require some preparation. Second, we can continue work on the boundary files so that there is a usable and roughly reliable GIS capability. This will take time, even if we find a willing researcher; I think we should seek to cooperate with a center with full-time researchers who see the value of an historical GIS. The provision of historical maps in digital form will, I am sure, have to happen if we are going to be serious about the spatial analysis of historical data in electronic form, this is a matter that goes well beyond the Hartwell project *per sé*. Third, it may even be possible to continue the Hartwell project into the future, once this basic work is complete, by appointing a full or part-time research to incorporate or link to the data sets created by other historians. Hartwell began his work before the World Wide Web made its appearance. As we switch to client-server systems I think we need to consider the possibilities for making Hartwell's software a Web-based application. This will have some interesting possibilities. For example, once the Harvard on-line catalogue is switched to a client-server system with CJK scripts, we could link to bibliographic data by author name and place name (as a subject heading). As the China part of the Electronic Cultural Atlas is developed, I trust with a GIS interface, it should be possible to link to the Hartwell material as well.

However this turns out, Robert Hartwell created the largest electronic database for the study of Chinese historical biography in the world. It is currently the most comprehensive such compilation extant; it is invaluable for the study of middle-period history and unlikely to be surpassed.