

Reflections on Japanese Village Locations, Boundaries and GIS in Historical Research

Philip C. Brown

Department of History, The Ohio State University

Introduction

Japanese historical research on village society and economy in the Early Modern (*kinsei*, 17th - mid-19th centuries) and modern (*kindai*, *gendai*, 1868- present) eras has long been one of the most dynamic fields of Japanese scholarship. Although there has been less focus on Japanese rural society in English language publications, the importance of the field has long been recognized, beginning with the publication of the late Thomas C. Smith's *Agrarian Origins of Modern Japan* (Stanford UP, Stanford, CA: 1959). Smith postulated that Japan's early modern economic development laid a positive foundation for her late 19th century economic development. While later English - language scholarship has moved closer to the more pessimistic view of Japan's 19th century history long held by professional Japanese scholars, curiosity about the links between late 18th century and Japan's modern social and economic development actively persist.

However, a fundamental problem arises for scholars who attempt to study this transition from early modern to modern eras in Japan's history, especially if one would use statistical socio-economic data. The problem is rooted in the uneven pace of change in different sectors of the state and society during modernization. Extensive political and administrative change initiated the transformation, a change that on the one hand sought to eliminate old political alliances and loyalties, and on the other, to adopt forms of administration that would mark Japan as "modern" in the eyes of Western nations with which she competed for a place in the late 19th century international political and economic order. However, while technological and scientific progress comprised a significant objective for Japan's new leaders, past structures of education and science also required significant transformation in order to embrace and promote modern scientific and technological knowledge. Educational and technical/scientific transformations came unevenly, and in some realms quite slowly. At the least, they lagged behind some of the administrative innovations that swept Japan in the first two decades of the Meiji (1868-1911).

The first broad political transformation brought the abolition of old baronial domains (the *han* 藩) and the creation of modern prefectures, major urban districts, a capital district, and the Hokkaido circuit (*ken* 県, *fu* 府, *to* 都 and *dō* 道). Redrawing of boundaries at this

high level of administration was not simple or quickly accomplished. In many instances several variations of redrawn boundaries were tried and abandoned before Japan's modern prefecture-based administrative system settled into its final form. At the lowest levels of administration, the village (*mura*, 村), transformation was even more radical. At the start of the Meiji era, 1869, the Japanese countryside was divided into some 60,000 villages; some two decades later that number was reduced to a small fraction by amalgamation into larger village units (also called *mura*, 村). The transformation was also furthered by the creation of new, enlarged towns and cities.

The second broad change, one intimately linked to the reorganization of villages, involved adoption of a new system of land taxation based on the British model. Briefly, this innovation required the measurement of all land and assigning a monetary value to it; certificates of ownership were distributed to all people determined to be legitimate landholders - all accomplished in only three years. This reform marked a radical social and economic transformation, one exacerbated by the difficulty in determining "ownership" in a society that had many kinds of enduring rights in land, only one of which could now be defined legally as the "owner". Land held communally by a village or several villages had to be divided and/or allocated. Some aggressive souls claimed such lands as their private possession. The new state, too, got in on the land grab, gobbling up prime forests and any land for which ownership could not be determined.

Both sets of changes, transformation of the state's largest administrative sub-units into prefectures and the re-organization of villages on a massive scale, have discouraging implications for those who would explore the transition from the society of Shogunal Japan to that of modern Japan. *Early modern villages* and baronial domains were the basic units for collecting any kind of statistical data throughout Japan -- the Shogun had no autonomous means of collecting such information. National population data often cited by historians, for example, was handed up to the Shogun based on local domain determinations of who to count. Some domains counted all commoners who lived from birth to the first of January following their birth, counting them as age 2 on that date. Others, like Kaga domain (加賀藩) did not count anyone under the Japanese age of 14 (13 by Western count). National estimates of the productive value (*kokudaka* 石高) of the country were similarly based on standards of measure and value that often varied by domain and even within a domain. Domains and villages kept the data on how many people in a village made tofu, owned guns, fished in large boats or with casting nets, or paid a particular miscellaneous tax (*komononari* 小物成). The task of linking this early modern data to that from modern, Meiji-era amalgamated successor villages, towns and cities alone is daunting.

A Key Problem

For anyone who wants to examine changes in how natural resources were used and controlled, however, there is an additional challenge: while there were efforts to map some of these administrative units, notably the layout of the early modern villages prior to amalgamation, Japan was not able to employ cartographic surveys on a technical par with those in European-ruled areas of the world. Location errors were common and these early Meiji maps did not employ latitude and longitude. This makes it difficult to position a village in a drainage basin or determine what resources it claimed within its boundaries. For many research problems associated with local economic development or the environment and its transformation in modern times, such data would be very helpful.

Modern cartographic survey techniques were an object of experimentation by famous cartographer Inō Tadataka (1745-1818) in the early 19th century, but they did not become widespread until the late 19th century. The first systematic, modern maps produced by the new government focused on the major metropolitan areas of Osaka, Kyoto and Tokyo. While modern surveys of these areas were produced in the late 1880s, the first modern maps of the rest of Japan took another decade to appear. A late-19th century 1:50,000 series represented the first comprehensive national survey effort using modern mapping techniques.

Unfortunately, by the time a modern survey was created, early modern villages had disappeared entirely from the face of Japan. Their names do not even appear on the 1:50,000 maps as informal, customary place names.

Heretofore, Japanese historians who have worked with local materials have worked through the difficulties of linking up individual villages or, for studies of larger areas, simply despaired of making direct investigations, skipping the difficult early Meiji and conducting analyses that jump from "before the Restoration" to the mid-Meiji era when national statistics of modest reliability are available (in the case of agricultural output, for example) or the early 20th century (in the case of demographic data). Beyond the local level, regional or national level data that crosses the divide seemed too difficult to assemble and use.

GIS now provides some unusual opportunities to analyze the transformation from the early modern period to the Meiji and after. It can help us bridge two periods that were comprised of very differently structured administrative units responsible for the collection of statistical data. It has the capacity to manage large amounts of data that are essential to assembling a mid-19th century link between pre- and post-Restoration eras. In addition, if reasonably efficient mechanisms can be developed for identifying latitude and longitude of A) the residential clusters at the heart of early modern villages and B) village boundaries, we will have the capacity to study the relationship between human society and its natural

environment over rather long stretches of history in ways that have not been possible previously. Genealogies of place names, statistical data from scattered sources, local soil types, elevation, slope aspect, and other forms of data can be readily juggled in a GIS,

To use the potential of GIS, the key issue remains: can we find a reasonably efficient means to identify village location? If not, the effort may simply be too expensive. It is to this subject that we now turn attention.

Some (Partial) Solutions

As I have traveled in the field during more than 25 years of research on the early modern history of old Kaga domain and the province to its north, *Echigo* 越後 (modern Niigata Prefecture新潟県), I realized that many local names could be traced back before the Meiji Restoration and that these names appeared as early modern village names in the documents I used for my research. In present-day Japan, these names appeared as the names of train stations, bus stops, neighborhoods and the like. I also became aware, in conversations with residents of a neighborhood, that even when not posted on signs at bus stops or train stations, people born and raised in communities referred to different sections of the town or village by customary names that also echoed those in my research documents. Such resonance did not mean, of course, that these places - bus stops, train stations, even neighborhoods - were situated today exactly where they would have been in, say, 1870. But the similarities encouraged me to be on the lookout for possible ways of investigating links between modern customary names and the locations of mid-19th century villages.

The advent of more publicly accessible digital data from the Japanese government (originally produced by the National Land Agency, *Kokudo Chiriin* 国土地理院, now the Ministry of Land, Infrastructure and Transport *Kokudo Kōtsū Shō* 国土交通省) in recent years provided one hint of possible salvation: published CDs (at a reasonable price!) of place names included a large number of names that did not appear on the 1:50,000 maps of the early 20th century or on the later or current 1:25,000 modern map sheets. Place names were linked to latitude and longitude (see FIGURE I SAMPLE DATA ENTRIES FROM PLACE NAMES CD). A quick check of customary place names for a region in central Niigata Prefecture revealed a substantial coincidence between these names and the names of early modern villages in the area as of the mid-19th century.

What did these points of latitude and longitude represent? Did they mark simply a calculation of position based on the placement of a label on some map? Or were they linked to something more substantive?

My questions remained unanswered until a few years later, when accurate, inexpensive hand-held GPS (Global Positioning Satellite) receiver units became available. During a

1/25000地形図の読み	市区町村名	注記文字列	注記文字列の読み	代表点経度	代表点緯度
1:25,000 Map Present	City, Place	Name Place	Name Reading	Representative Longitude (decimal degree)	Representative Latitude (decimal degree)
えちごよしだ	三条市	大島	おおじま	1385801.7	374021.5
えちごよしだ	三条市	代官島	だいかんじま	1385907.5	374024
えちごよしだ	加茂市	鶴森	うのもり	1385952.7	374057
えちごよしだ	加茂市	田中新田	たなかしんでん	1385950.9	374119.7
えちごよしだ	燕市	新生町	しんせいちょう	1385737.6	374111.3
えちごよしだ	燕市	関崎	せきさき	1385628.2	374104.3

FIG. I SAMPLE DATA ENTRIES FROM PLACE NAMES CD

grant from a joint program of the US National Science Foundation and the Japan Society for the Promotion of Science (JSPS, *Gakujutsu Shinkōkai* 学術振興会), I made contact with an informant who had grown up in the area of Yoshikawa town (*Yoshikawa-chō* 吉川町) and who had been a significant figure in the writing of a recent local town history, a six-volume compendium of several thousand pages of documents and essays. He agreed to drive me around to several of the areas that encompassed several dozen early modern villages. (The target area for this and other samples developed for, and discussed in this study are identified in FIGURE II.)

The afternoon that I arrived, we drove around to some four dozen settlements in the Yoshikawa area, getting as close as possible to the center of old residential clusters my informant knew, through childhood experience and through historical research, to be the sites of early modern residential clusters. Narrow country roads (one car at a time, please!), heavy shade, and sometimes social propriety compromised some opportunities to get into the heart of a settlement. Nonetheless, at the end of the day I had a fair sample of locations associated with the names of early modern villages that also appeared in the Japanese government place names CD. The results appear in Figure III (A & B).

As the two displays in Figure III (A and B) indicate, the fit between the two sets of data is quite good, even though the circumstances under which the GPS data were recorded was very hurried and compromised in some cases by inability to take readings near the center of residential clusters. Even in the worst case (III-B) the readings are only off by about ten meters. This is certainly a "good enough" fit for many academic uses.

However, there are limitations to using this approach. Yoshikawa is a rural area, not subject to bombing during World War II, and not bulldozed by suburbanization or city planners, and the like. Nor were the early modern villages of this area eliminated by the construction of dikes, dams and similar riparian works. That cannot be said for many parts of Japan.

In those instances where the forces of man and nature have forced significant change, early modern village names are likely not to have survived to the present day in rosters like

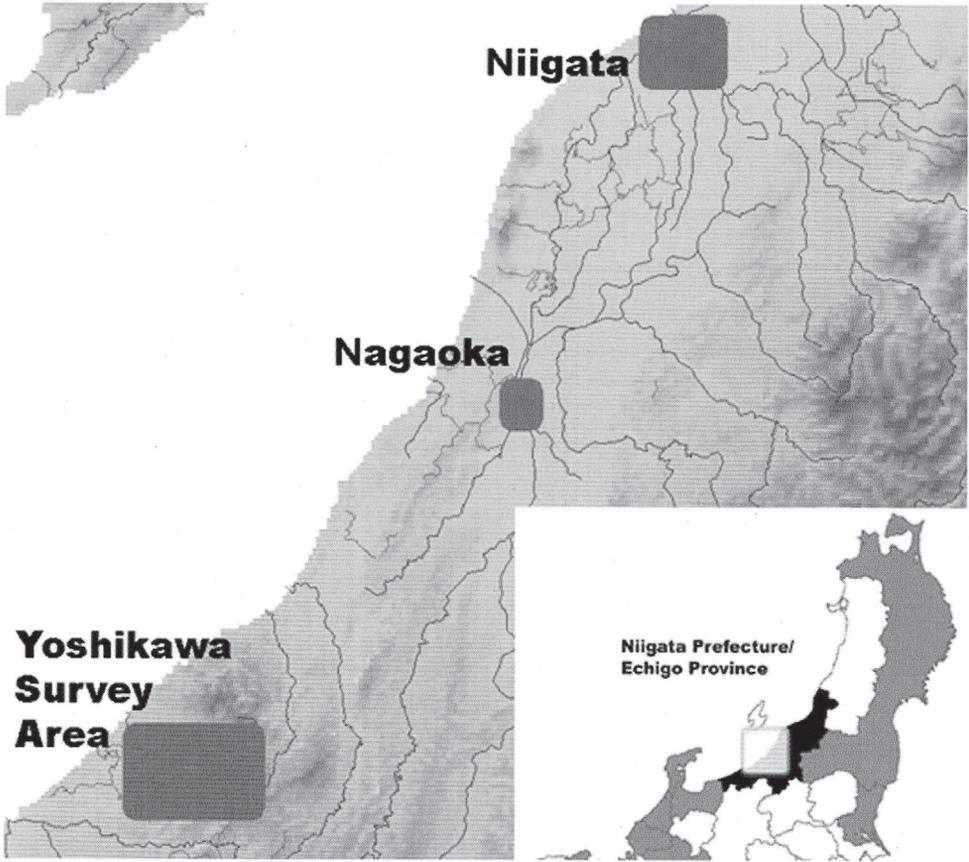


FIG. II TARGET AREAS OF STUDY

the Japanese government place name CD. A number of the names in the place names roster compiled for use in preparing 1:25,000 topographical maps are clearly modern creations. In such cases, on-the-ground and in-the-archive legwork will be needed.

Despite such instances, the place name roster provides a convenient starting point. To refine the starting point a bit further, this data can be compared with the Ministry of Agriculture, Forestry and Fisheries's (*Nōrinsuisanshō* 農林水産省) annually collected data on agricultural communities (*NōgyōShūroku Chōsa* 農業集落調査). These communities are least likely to be new and most likely to be continuous and direct descendents of mid-19th century villages.

Although I have not yet had a chance to conduct the kind of "test" that I did for Yoshikawa residential settlement center point locations, recent data from the *Nōgyō Shūroku Chōsa* may also prove useful in developing boundary locations for early modern villages between the Meiji Restoration (1868) and the first modern cartographic surveys. Ministry officials delineated the boundaries of agricultural communities and that data is now

Yoshikawa area I:
 NLA data = Green triangles, GPS Data = Red circles

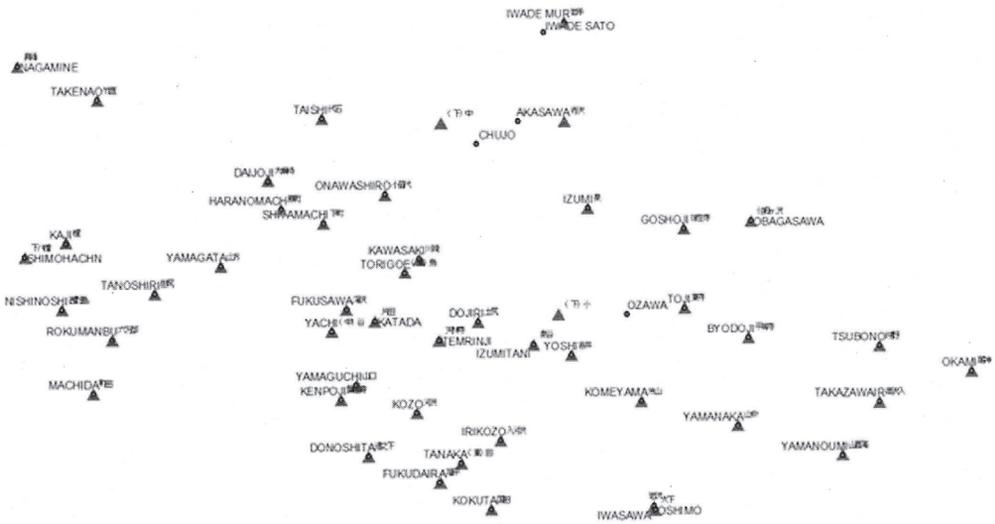


FIG. III-A MATCHING OF JAPANESE GOVERNMENT (NLA) LOCATION AND DATA FROM GPS READINGS

Yoshikawa area II:
 NLA data = Green triangles, GPS Data = Red circles



FIG. III-B MATCHING OF JAPANESE GOVERNMENT (NLA) LOCATION DATA AND DATA FROM GPS READINGS



FIG. IV SAMPLE MAPPING OF AGRICULTURAL COMMUNITIES, 2000

available to use as a first estimate of how mid-19th century villages were configured. (See FIGURE IV SAMPLE MAPPING OF AGRICULTURAL COMMUNITIES, 2000)

A word of caution is in order. For early modern villages (as opposed to those of mid-Meiji and later) any discussion of "borders" in the modern sense is misleading. In the era of the Tokugawa shoguns neither the Shogun nor the daimyo were consistently interested in demarcating village boundaries. Except for lands specifically reserved for domain (*han*) use, rulers were primarily interested in those lands that were particularly productive - arable - and to a lesser degree, more marginal lands that might also be productive such as mountain fields or marshes that produced rushes for thatch, and the like. Yet the interest in these more marginal lands was not so great as to stimulate rigorous measurement and assessment. In addition to lands that were clearly part of one village, there were also common lands (*iriai* 入会) that might be used for foraging, green manure, etc. Often more than one village shared a number of these lands, and while use was systematically regulated by local village residents so that residents of each village got fair access to the resources of the commons, neither village nor domain felt that it was necessary to mark clear borders between villages. Domain authorities got involved only when there were disputes between villages that could

not be resolved otherwise. The legal maneuvering certainly resulted in increasing demarcation of boundaries between villages, but the first systematic effort to create complete and well-marked boundaries came only with the Meiji Land Tax Reforms. Even when we have hand drawn maps from the early modern era, the sense of what boundaries meant was not the same as the modern meaning of a boundary. Sequences of maps of the same area can show significant variation over time, especially as a boundary may invade or recede in common lands shared by several villages. Under these circumstances, an effort to recover early Meiji village boundaries is an effort to grasp a new creation of the state - the bounded village - that did not necessarily coincide with villagers' sense of their own place. Despite this caveat, the effort to recover mid-19th century village boundaries provides us with a starting point for trying to understand Meiji and late early modern resources available to villages, how they utilized those resources and how natural phenomenon impinged on village as well as regional society and economy.

A Brief Example of GIS Analytical Utility: Man and Nature in Early Modern Japan

Without going into great detail, we can briefly illustrate the utility of this locational data. For present purposes use of residential settlement center point latitude and longitude are sufficient to conduct a preliminary test of a well-established historical interpretation regarding the re-relationship between environmental circumstances and the presence or absence of a form of corporate village landholding called *warichi* (割地). *Warichi* was practiced in many villages in the area of modern Niigata prefecture. Under this system of landholding villagers did not own land directly, but owned shares that allowed them to cultivate a certain amount of land held by the village as a sort of corporation. Like shares in a joint stock company, owners could generally dispose of their shares as they wished - through sale, inheritance, and the like. Each share entitled a holder to a proportion of each type of land in the village. For example, if a village consisted of 1/3 superior paddy, 1/3 average paddy and 1/3 average dry field, the fields cultivated by a shareholder would consist of 1/3 of each of these three types of land. In other words, no one would get stuck with all poor land, or all land most subject to flooding. In effect, each shareholder would hold a diversified portfolio of land. To accommodate changes in the land under cultivation, villagers periodically assessed the quality of arable lands in the village, measured them, divided them up into shares, and then reallocated cultivator access to them by use of a lottery.

Why would villagers go to such trouble and employ such a cumbersome system to manage their arable land? Standard explanations argue that this type of land tenure system was found in regions that were at unusually high risk of damage from floods (landslides are less commonly mentioned). By employing GIS to locate early modern villages and by

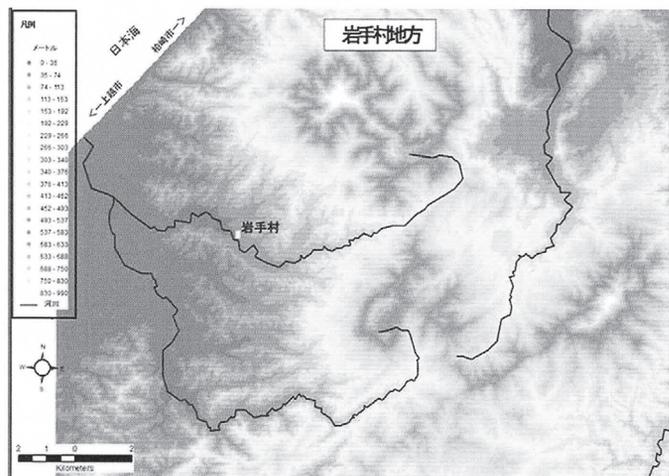


FIG. V Location of Iwade Village, within "Yoshikawa Target Area"

extrapolating a bit from this hypothesis we can begin to assess its validity.

FIGURE V shows the location for one village for which I have accumulated data. Note that it is not in a large flood plain or river bed. Previous research has established that this village reallocated land once every ten years during the 18th and early 19th centuries.

Turn, now, to FIGURE VI, which depicts several early modern villages in what is now Niigata City. These villages are located on the broad flood plain of the Shinano River, Japan's longest. The map covers an area a bit more than two kilometers wide. The two villages for which we have *warichi* redistribution data are at the bottom (south) of the map, Shindoori and Kamegai. They are a kilometer apart, on land that was created by deposits from frequent flooding, about a meter above sea level. The "mountain" to their north is a

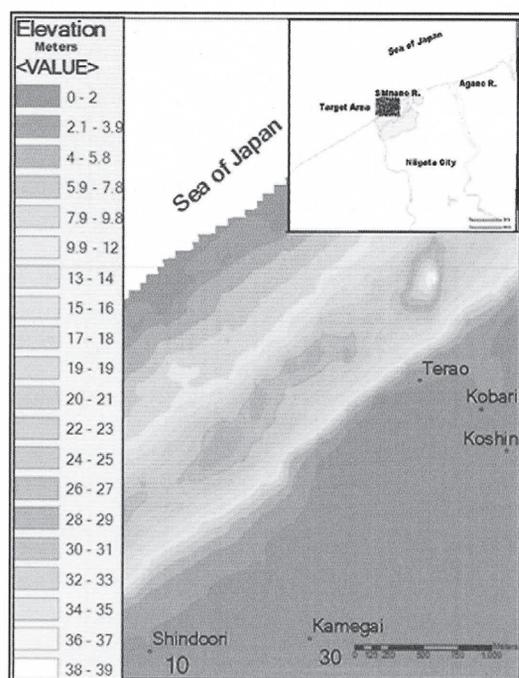


FIG. VI Southern section of modern Niigata City

grand peak of 39 meters at its highest; it is essentially a large sand dune. To the south and east of these villages flows the Shinano, about a kilometer away. Kamegai, the village closest to the Shinano, redistributed land every three decades; Shindoori once a decade. This phenomenon is counter-intuitive, for if there were a clear link between *warichi* and flooding we would expect the village closest to the river to redistribute more frequently than a village further away.

However, this comparison raises several other issues. Why, for example, do two villages that are so close, and that share the same climate and depositional soils redistribute at such different

intervals? Why do these villages, close to Japan's longest river, redistribute at intervals that are the same or longer than Iwade village, a village that is not on a large flood plain and which has only short, minor rivers nearby? Climate is not substantially different in Niigata as compared to the Yoshikawa region. Soils might be different - only further investigation will clarify this point - but the suggestion in this limited sample is that relationships between *warichi* and natural phenomenon are not so directly linked, that we have to explore other socio-economic considerations if we are to understand why some regions adopt this system of land tenure and others do not.

Methodologically, what this small exercise indicates is the value of GIS in developing interregional comparisons. Precise location of villages such as those in our comparison of Shindoori and Kamegai allow us to look carefully at both distance and elevation. Similarity of stream and drainage basin size, as well as soil type and climate similarity can be adduced from the small size of the region we are examining here, but for larger or more disparate regions more detailed data can be factored in as well.

Summary and a Pedagogical Reflection

The preceding sections have made the argument that GIS is useful in preparing well-structured regional comparisons of the interaction between man and nature in Japanese history. (Other comparisons can also be facilitated with the use of GIS mapping, imaging and data base manipulation capacities, of course.) A case has also been made that discovery of settlement center point and boundary locations for mid - 19th century villages (ca. 1860-1880) are particularly valuable for linking important historical data of the pre-modern era to that of the modern era; given the different systems of regional and local administration between the two eras, data recovery at this level is something of an imperative, despite the effort that will be required. In a related vein, I have suggested that there appear to be reasonably efficient means to cut out some of the labor involved in identifying center point and perhaps even boundary locations. All of this suggests a great deal of potential for developing a Japanese version of a "national" GIS.

Development of so-called "national" GIS projects has moved ahead in a number of world areas. Western Europe appears to be most advanced, and a Chinese effort is well under way. Data are often made available on-line for public consumption. Indeed, on-line availability of such projects marks one of the broad, public benefits which such projects employ to appeal for institutional and financial support. For the most part, these projects develop within the perspectives of "local" historians and geographers. People who were born and raised in the society that is being placed under the GIS lens for examination and representation.

Even in a single-culture context, I suspect that I am not alone in having experienced a

form of academic "culture shock" that arises from the potential of GIS to bring together people trained in different and very disparate academic disciplines. Disciplines have their own cultures that reflect norms of operation, values, forms of evidence, forms of documentation and rhetorical traditions. To take but a simple example from the American academic setting, in the fields of computer science, geography and many other disciplines in engineering or science, scholars accept as common practice co-authorship of articles and other scholarly materials; faculty in history often assume that if an article is co-authored there is no way to evaluate an individual's contribution to the work and many departments of history will not consider such co-authored works when determining merit pay raises or promotions. How credit is shared between different participants in grant application presents similar, sometimes sensitive issues in large grant applications. For humanists who typically seek funding for an individual research enterprise, whole new sets of social sensitivity and skills are required. (Viewed from the perspective of someone used to collaborative research, the high degree of emphasis on individual research efforts of humanists may strike them as hermit-like, and odd, if not outright anti-social.)

That so many scholars transcend such difficulties is a testament to the potential of GIS to foster productive interdisciplinary enterprises, to generate an excitement that makes overcoming all the challenges and difficulties worthwhile, but if GIS presents these problems within a single national culture, it also hints at issues we should be thinking about as (web-based) GIS crosses world cultures. The issue may be rather less pronounced in purely academic contexts, but it represents a substantial challenge outside of that realm. A lack of awareness of the need to bridge cultural divides can lead to significant problems of oversimplification, misunderstanding and stereotyping, deepening and hardening cultural differences rather than promoting values of respect, tolerance and mutual understanding.

Simply stated, a core issue is that of translation; making elements of one culture comprehensible for people of another. For practitioners in the Western European cultural context my suggestion may not seem so significant if they think in terms of differences between Denmark and Germany, or Italy and Spain and the like as the units of cultural division; however, readers who make a career of trying to explain Asian or African cultures (for example) to practitioners of other cultures will, I think, understand my concerns. Dramatic examples come in the field of entertainment: For how many Americans has "The Last Samurai" shown that an American can become a Japanese samurai while simultaneously many Japanese will look at that same film and enjoy the performance of Watanabe Ken immensely, but look at Tom Cruise's performance and say, 「何か違うなあ。」 ("There's something odd here.") The film still seems very American to most Japanese. Both American and Japanese observers look at the same object, but see it differently.

Such reactions serve as a significant reminder that even images - the heart of GIS - can not be presumed to be a perfect means of cross-cultural communication. For example, GIS presents the possibility, demonstrated by The Art Entertainment Project undertaken by faculty at Ritumeikan University and several other Kyoto institutions, of virtually "walking" the streets of early 20th century Kyoto - about as close to time travel as most of us are likely to get. Without getting into the jargon of post-structuralism too deeply, whatever the core intent of the creators of the project, whatever they wish to evoke in Japanese observers can not be presumed to be the message that viewers will "read;" the problem is compounded for non-Japanese whose learning would certainly be enhanced by additional explanation of some sort.

As with all translation, we deal more with art than science; no matter how hard we have tried to date, we can not reduce translation to something purely mechanical. Old style wooden buildings of Kyoto are called *machiya* (町屋), which might be translated as "town house," but for a Kyoto-ite the reference is to a genre of house types (see Figure VIII); for an American, it is likely to call to mind only one type - the row house (sorry, no photo!). Differences in the illustrated types will probably require explanation for American viewers who may, from a Japanese perspective, "over-generalize," "see only one type where a Japanese sees two or three, or more.

Making maximum use of a web-based GIS project creates an opportunity for a significant measure of cross-cultural collaboration in order to minimize mistakes and misunderstandings. This is particularly true when we think of authors and users who reside in considerably different cultures. Unfortunately, national funding agencies typically are not prepared to fund the work of scholars outside of the agency's home culture and its resident aliens. Nonetheless, I wish to take this opportunity to encourage us all to think about the potential for using GIS to further cross-cultural understanding. The software that provides us the opportunity to combine data and image effectively for analytical purposes also permits us to amend, annotate, and explicate our products. This potential can be harnessed to provide relevant reference tools - transcription aids, dictionaries - in ways that are more flexible and widely available than heretofore possible.

This conference has gathered together researchers from many parts of the globe to explore the analytical potential of GIS in researching our past. I enjoy my own explorations in this area and profit greatly from the work of colleagues assembled here. I look forward to further discussions on these subjects in the remainder of the conference and hope to continue our conversations in the future in other venues. However, I hope we will also discuss the means by which GIS can be employed to promote cross-cultural understanding.



FIG. VII Kyoto scene, 1928, from the Art Entertainment Project, virtual models created from contemporary historical maps and similar historical data; housing models produced from digital photos of surviving examples of each style of construction. (Courtesy of Yano Keiji)

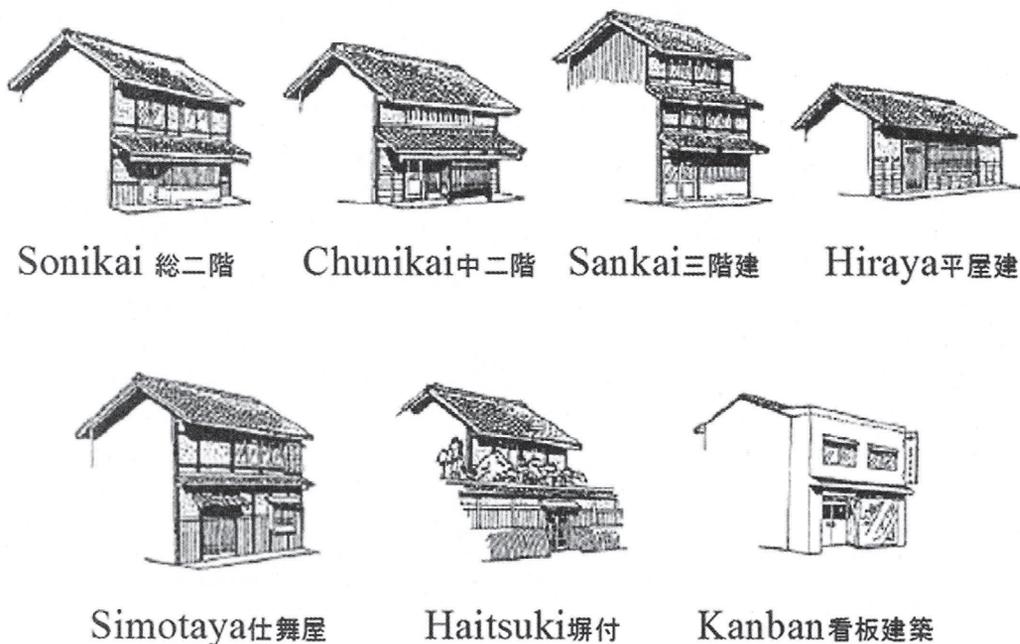


FIG. VIII Sample types of Kyoto "machiya" ("townhouses") (From the Arts Entertainment Project. Couetesy, Yano Keiji)

日本における村落の位置、 境界とGISの史的研究の考察

フィリップ・C・ブラウン

オハイオ州立大学

近世・近現代における日本の歴史的村落社会と経済の調査は、日本をフィールドとする学問の最も興味深い分野の1つであった。かつてから欧米でも日本村落社会に注目した出版物は存在したが、フィールド研究の重要性を示唆した端緒は、故トーマス・C・スミスの"Agrarian Origins of Modern Japan (Stanford UP, Stanford, CA: 1959)"であったといつてよい。スミスは、近世日本経済の発達を、19世紀における経済発展の確固たる基礎となったと仮定した。これに対し、後の欧米の研究者は、19世紀の日本の歴史について、18世紀の終わりと現代日本社会・経済の関連な発展を結びつけることに熱心な日本の研究者によって長く支持されてきた、悲観的な見方をするようになっていた。

GISは、江戸から明治あるいはその後の時代への転換について分析する機会を提供する。言い換えれば、全く異なった管理体系単位と構造をもつ2つの時代を、標準化された統計値によって橋渡しすることを可能とするのである。もう1つの重要な点は、その機能性は同じように、ある地方共同体と他の共同体あるいは自然がどのように相互作用したかの検討をも可能とすることである。このGISの可能性について、国際的な議論としてはあまり顕著ではない。

もし研究者がGISを正しく利用するならば、日本の19世紀の移行期研究はとても重要な視座となる。19世紀の最末期、近現代的な意味での村や町の境界が確立され、近代的な地籍調査によって最初に地図化されるにいたり、徳川時代にムラと呼ばれた最小単位での管理体系の単位は、より大きな同じくムラと呼ばれるモノに結合されていった。残念ながら、このことは19世紀中葉における明治以前のムラの正確な緯・経度情報に我々がアクセスできないことを意味している。

しかし、場所の合理的な近似を再構築できるデータ、そしておそらくそれが19世紀中葉のムラの境界を示しているであろうデータを我々は利用することができる。ここでは現代のデータに19世紀中葉のデータを結合させるアプローチが有望であると考えられる。一見、それら双方のデータセットは共に有用であるように、あるいは無用であるように思えるかもしれない。なぜなら、現代のデータは緯度や経度を明確にするためには意味があるが、それが、19世紀中葉のムラとリンクできない限り意味はない。また、19世紀中葉のデータも、往時のムラの配置を知ることに対しては有用であるが、それが正しく緯・経度情報を付与されない限り、GISで解析することにおいてはあまり意味がない。

この発表では、19世紀中葉のムラの立地を識別するためにどのように現代のデータを利用するかについて簡単に検討し、近代割地の農民アクセスに関する再分配について、分析的にデータを応用した事例を紹介する。