

# House, Home, Neighbourhood: Socio-historical reconstruction

*David Hood*

Caversham Project, Department of History  
University of Otago, Dunedin, New Zealand  
Phone: +64 3 479-8622 Fax: +64 3 479-8429  
Email: caversham@otago.ac.nz

Presented at SIRC 2001 – The 13<sup>th</sup> Annual Colloquium of the Spatial Information Research Centre  
University of Otago, Dunedin, New Zealand  
December 2<sup>nd</sup>-5<sup>th</sup> 2001

## ABSTRACT

Historical space is fragmentary, inter-related, and imprecise. Historical modelling of geographic information is a time consuming, complex process. Taking advantage of the implicit relationships present in historical data enables inferences to be drawn about the components of the relationship. This paper explores reconstructing historical space through the use of multiple textual sources. Re-numbering of properties over time is established by the relationships of the inhabitants. Establishing changes in geographic label over time enable geographic assignments made for records in one time to be rapidly assigned to records at other times.

*Keywords and phrases:* history, reconstruction, inference, methodology

## 1.0 INTRODUCTION

Providing a spatial representation of historical sources has a number of difficulties intrinsic to the nature of the source material. The historical record is fragmentary, error-prone, and of variable precision. With information drawn from the social world, labels of objects can vary between sources and across time. Different features can also share the same names. This leads to confusion when reconstructing the past.

This paper presents a methodology for the use of implicit social relationships in socio-historical data when positioning historical records in space time. This draws on work establishing database linkages through implicit relationships in socio-historical data at the Caversham Project (Hood, 2001).

The Caversham Project is a interdisciplinary project based in the Department of History, University of Otago (<http://www.otago.ac.nz/nzpg/caversham>). The project use quantitative and qualitative means to explore the southern suburbs of the city of Dunedin between the years 1893 and 1940.

Taking an example street, the paper illustrates the reconstruction of location that is possible from textual records. The limitations and advantages of the technique are explored, in relation to the test street.

## 2.0 THE CAVERSHAM PROJECT

The Caversham Project is an interdisciplinary research project studying the southern suburbs of Dunedin between 1893 and 1940. This area was chosen for study as it formed the basis for modern New Zealand urban society (Olssen 1995). The area was a microcosm of wider New Zealand society and the largest industrial area of the day.

### 2.1 Study Area

The southern suburbs of the city of Dunedin between 1893 and 1940 consisted of 251 streets. Between the southern suburbs and the more northerly parts of the city is a spur forming a natural geographic boundary. Public land use saw the border area form a social boundary of parkland, cemetery space, and sports fields.

The study area contained a resident population of up to approximately 19, 000 people aged 21 or over. The population contained demographic elements that paralleled other New Zealand urban centres of the day.

Temporally, the study period begins with women's suffrage in 1893. This marks wide scale electoral participation by women, and the consequent large scale appearance of women on public records. The study period concludes in 1940, a boundary marked by the Second World War.

## **2.2 Sources**

The quantitative focus of the project consists of a database of digitised records from (largely) public sources. The estimated 250, 000 records are combined together to provide a detailed account of the area.

The qualitative strand of the project is based around an extensive collection of oral history interviews with residents of the area.

A G.I.S. comprises the third area of interest. The G.I.S. uses land valuation material to digitally model the urban landscape of the day. The hand written valuation books, and accompanying land valuation maps, for the years 1911 and 1922 form the basis of a historical-spatial representation of the area.

## **3.0 HISTORICAL SPACE**

In considering questions involving historical space, there are several key points of difference to spatial information collected in a contemporary setting. In contemporary geographic information systems projects, even those involving a temporal element, the goal is to isolate aspects of the world so that they may be analysed. In an G.I.S. such as the Caversham Project, which deals with a wide variety of historical sources, the aim is reconstruction from fragmentary data.

### **3.1 Data Sources**

Information on the past is contained in many sources. Common to all historical sources is that they are a partial representation of what has occurred. In employing them in a reconstruction project, the information comes in a pre-categorised and incomplete fashion. This fragmentation can be alleviated by combining multiple sources, enabling a more complete picture of the past to be established.

### **3.2 Location**

In historical documents providing location information, the commonest means of providing such information is address. This address can range from the general, such as listing of country of origin, to the specific, that of individual street address.

As well as the huge corpus of textual documents that provide spatial information, historical maps and photographs provide representations of the landscape. Just as textual representations of location can contain varied levels of detail, so too can graphical representation of space offer different levels of accuracy (Moylan 2001).

### **3.3 Time**

Time can be presented in as fluid a format as spatial location. The date of publication of a document provides one historical reference. The document itself can refer to events taking place at another time, or a range of times (McKay and Cunningham 2001). Given the time spent gathering and compiling historical sources, even those documents that present themselves as a snapshot of a particular time may have been gathered over a range of time.

### **3.4 Analysis and Modelling**

Much of the analysis of quantitative historical sources is focused on change over time based on comparisons between sets of data. By introducing spatial information to the analysis questions of change in relation to space can also be made. Combining the two can generate analysis of space time.

Examples of such questions are:

- Exploring the relationship of residence and occupation.
- Analysing the diffusion of family groups.
- Studying the relationship between mobility and class structure.

- Investigating the clustering of social groups across time.

In presenting a model for temporal-spatial representation, the model is governed by the types of evidence to be analysed, and the knowledge sought from the analysis. Among the varied approaches to representing temporal space (see Moylan, 2001), the comparative analysis of the Snapshot approach (Langren 1992) is suited to fragmentary social-spatial historical sources. However, rather than seeing it as an approach to measure landscape change, it is a means to synthesise and analyse multiple sources with a spatial and historical dimension. The fragmentary and episodic nature of historical sources is suited to an approach that explicitly acknowledges the gaps in the historical record.

### **3.5 Problems**

The process of creating the G.I.S. has highlighted several problems in transferring historical material into a digital form. The records themselves often contain far more variation than would be acceptable or expected in modern records. On official documents, such as the electoral roll, names of the same people often saw several different variations across years. Address details could also see variation between years, both due to spelling variation and changes in address number or street names.

#### **3.5.1 Transcription**

Historical sources have been through a variety of hands in their creation. For those project sources where personal details were provided by the person in question, there is approximately a 5 per cent variation in name over time, for those sources gathered by a collector writing down the information a 10 per cent variation exists.

Many of the sources used by the project contained information gathered in longhand script and transcribed into printed public records. These public records are scanned to provide records for the database. Both the transcription of the original longhand and the subsequent scanning can create errors. Such errors are resistant to spell-checking, since such documents do not contain standard words. Street numbers, in particular, can be difficult to validate.

Handwritten sources, while lacking scanning errors, are still faced with transcription errors. The difficulties in reading old handwriting can stem not only from the style of writing, the condition of the source can also present transcription difficulties.

#### **3.5.2 Labelling**

Due to changes in administration, inhabitants, or fashion, it is possible for a geographically fixed property to have several different addresses or names over time. It is equally possible for a single address to migrate between several different properties over time.

#### **3.5.3 Structure**

Finally, the form and content of historical records can change over time.

Changes in collection or organisation of historically gathered information can necessitate different data structures for each instance of the same source. The digitisation and organisation of historical records can thus be a time-intensive process.

## **4.0 SOCIAL SPACE**

As the process of incorporating large scale hand written property records into the G.I.S. is an intensive one, the project has explored ways of incorporating records from other sources to build geographic information. This draws on the relationship between physical objects, social objects, and social relationships. This relationship can be expressed as the difference between house, home, and neighbourhood. By inferring location on the basis of the social network, geographic location can be assigned across time.

A house exists as a physical object. People live in the house, thus forming a relationship between the people and the house. While the particular resident at a house may change, there are normally residents present for the life of the house.

Within the community the residents exist in a social relationship to each other - a neighbourhood. While the constituents of the neighbourhood change over time, the relationship of the neighbourhood continues.

### 4.1 Relative Position

One of the easiest forms of neighbourhood to reconstruct is the street. In New Zealand the convention is odd and even numbered addresses to be on opposite sides of the street and extend in a series. Thus number 24 will follow number 22 and precede number 26.

### 4.2 Multiple Relationships

The side of a street can be expressed as a matrix of those resident in its houses at a particular time (see figure 1). This network can be abstracted from the absolute positioning of the houses and expressed as the relationship of those present.

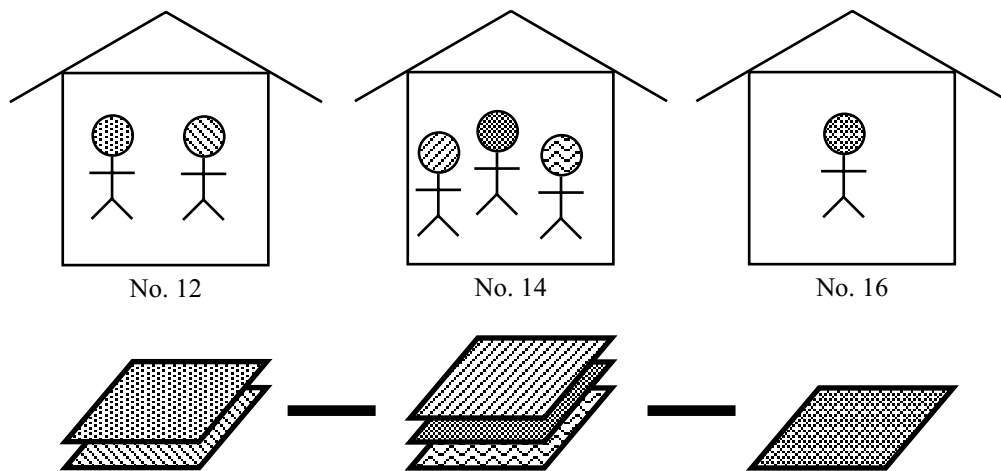


Figure 1 : Abstraction of Residents

### 4.3 Reconstruction

By linking together the neighbourhood relationships of different years, occupancy of specific properties can be assigned. While the individual household details may not provide enough information to assure a match, the pattern of the relationships enables an inference to be made (see figure 2).

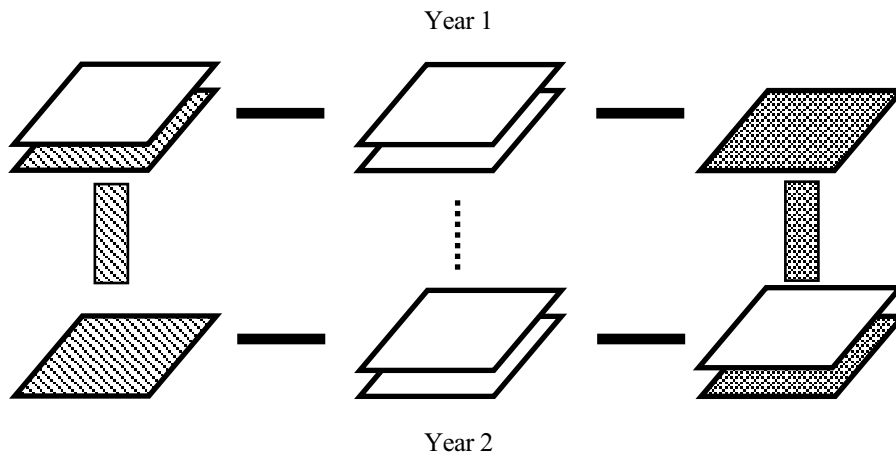


Figure 2 : Matching by Neighbourhood (middle property inferred)

An example of such inferential linking can be seen in Fitzroy Street, South Dunedin, between the years 1925 and 1928. In 1925 electoral records for 20 Fitzroy Street listed Annie Milne Hoar, Charles Hoar, Jane Nelson, Elizabeth Reid, and John Reid. Next door, at number 22, were listed John McBain and Pearl McBain. At number 24, one further house down the street, lived Catherine Milligan and George Milligan. In 1928 Annie Milne Hoar, Charles Hoar, Findlay Andrew Nelson, Gowan James Nelson, Jane Nelson, Elizabeth Reid, and John Reid lived at number 25. Next door, at number 27, were listed Agnes Walsh and John David Walsh. The next house in line, number 29 had Euphemia Campbell, Thomas Mills Campbell, Catherine Milligan, Fay Milligan, and George Milligan (figure 3).

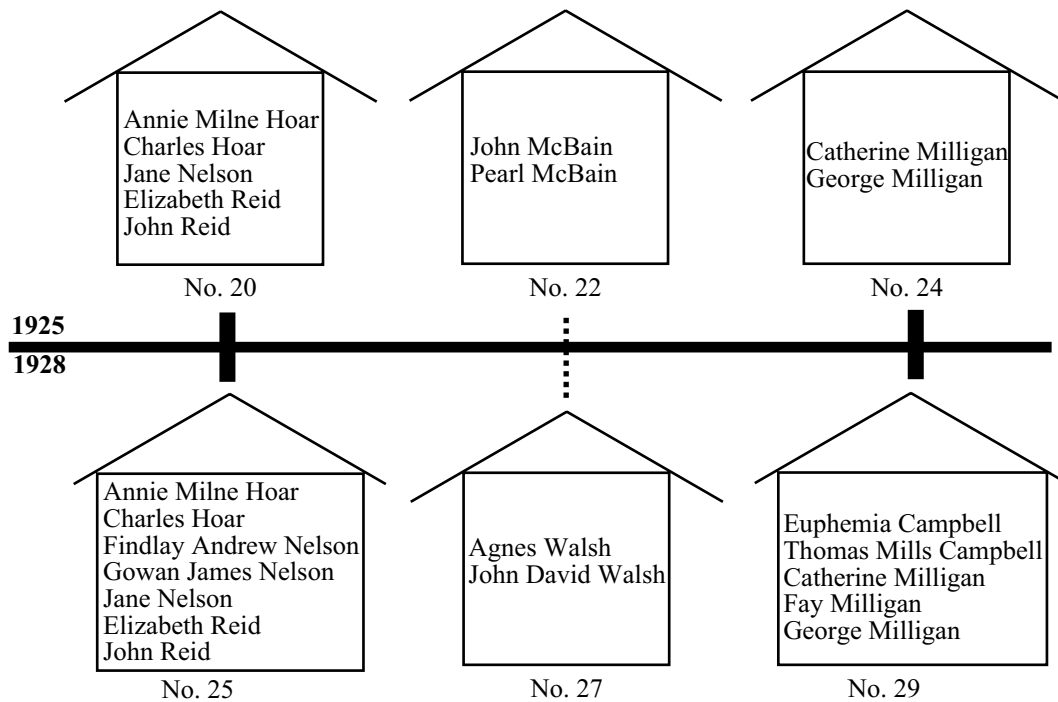


Figure 3 : Inferred linkage through relative position

From the continuity of residents, we can conclude that number 20 becomes 25 and number 24 becomes 29. If we consider the intermediate property in isolation there is no evidence bridging to two years. However, as there is only one property between numbers 20 and 24 in 1925, and one property between 25 and 29 in 1928, we can infer that number 22 become number 27. This inference is made on the relationship between the records, as both the address number and the occupiers of the house change between the periods.

#### 4.3.1 Prerequisites

To infer continuity of residence on the basis of the neighbourhood pattern, several prerequisites need to be met. The sources must be a near complete representation of the neighbourhood of the area. An incomplete reconstruction does not establish enough relationships for viable comparisons to be made across time.

The neighbourhood reconstructions must occur frequently enough that continuities may be traced. Because this reconstruction technique depends on the entirety of the neighbourhood relationships, it infers when change has taken place on the basis of those parts of the network that are continuous. If too much time has passed, then too little continuity will be present among the network members to infer those parts that have changed.

Finally, if catastrophic events occurred that disrupted the social neighbourhood, this would disrupt the ability to trace over time. The neighbourhood reconstruction method can only be applied to those areas that have not been subject to war or natural disaster.

#### 4.3.2 Multiple searches

In order to allow for the creation or destruction of housing, first clearly identifiable households were linked. Then the comparisons between intermediate houses were made. To identify changes in the scope and placement of housing, as well as labelling, comparisons were made between neighbouring properties (figure 4).

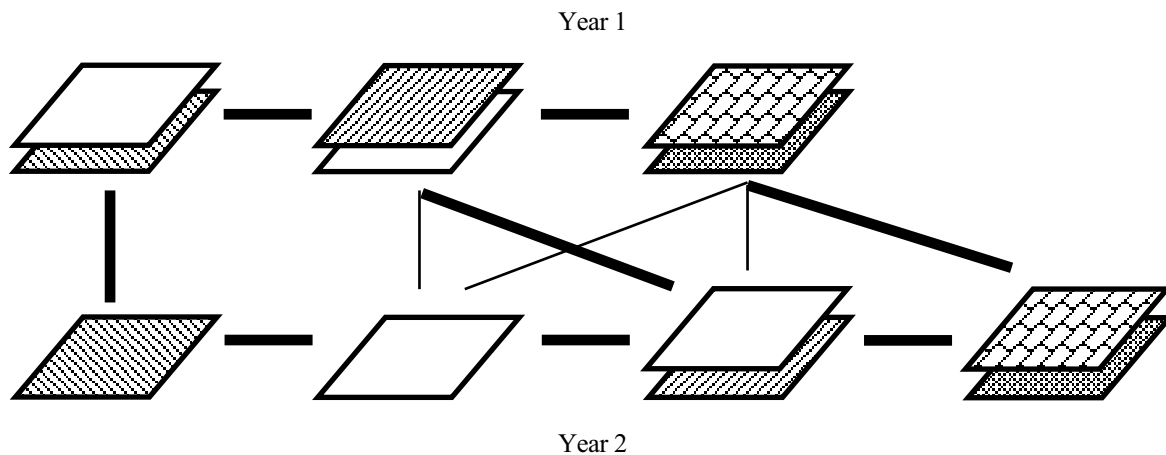


Figure 4 : Multiple Comparisons identify a new property constructed between Year 1 and Year 2

## 5.0 FITZROY STREET

To test the strategy of neighbourhood reconstruction, Fitzroy Street in South Dunedin was selected as a test case. While large enough to provide a reasonable sample for computation, it was also small enough for a complete manual check to be practical. The street existed for the entire study period as a mix of housing and market gardens, with an occasional business property. Through the study period the length of the street expanded, and the number of houses increased. For this test an initial year of 1911 was taken as a baseline for the street, and the residences of the street were followed through time in several sources.

### 5.1 Sources

Three different sources were employed to reconstitute the Fitzroy Street neighbourhood. Each source offered different information on the original region.

#### 5.1.1 Cadastral Data

The Valuation records of 1911 were one of the years used to build the G.I.S. The Valuation property map was scanned onto the computer and incorporated into the G.I.S. The handwritten records of the valuer's visits to the households were transcribed into a database of property information. Using the 1911 roll as the initial year for neighbourhood reconstruction had the added advantage that this was the first year that street numbers were recorded in national documents such as the electoral roll.

#### 5.1.2 Electoral roll

The electoral rolls consist of printed information of the electors of a region. They provide name information and partial address information, depending on the details provided by the elector. These rolls were scanned, encoded, then combined into a database. Due to the difficulties of spell checking numbers, the street numbers of the electoral address are less reliable than other parts. The elections took place between three and five years apart depending on national circumstance. Each electoral roll represents a broad and non-uniform period of time. Because of high electoral participation several people in a household were often enrolled to vote. The electoral rolls serve as a very good representation of the people of the street, and a poorer representation of their location.

#### 5.1.2 Street directory

Street directories provide detailed information of the relative location of the dwellings in the street. They list addresses of buildings and locations of cross-streets, in order, on each side of the street. Street directories were compiled annually, so represent the slice of life at the time of the compilers visit. The amount of personal information provided about residents in the street directories is limited, normally only a single resident of a particular address is listed.

## 5.2 Relationship Reconstruction

By combining the electoral roll and street directory information, the rich neighbourhood relationships were traced through time. Of the 59 properties present in the street in 1911, all were followed through time by the neighbourhood relationship. This included tracing the properties through a dramatic street renumbering process in 1928 that saw the odd and even number sides of the street swapped. From the neighbourhood relationships

we can infer that references to 6 Fitzroy Street in 1911 refer to the same property as 9 Fitzroy Street in 1928 and 7 Fitzroy Street in 1938.

### **5.3 Approximate Positioning**

With the developing of housing in the region it proved possible to identify the approximate position of new houses built in the street. Where a new house was built directly between existing homes, its location could be inferred in detail. Where a series of properties were developed from market garden land the inferred positioning was more approximate.

### **5.4 Street Events**

In evaluating the neighbourhood relationship, the influence of corner properties quickly became apparent. A property at an intersection has a relationship to all intersecting streets. Changes to this corner property could have a flow on effect through properties in the adjoining streets. For example, the development of an automobile service station on a cross street corner property saw the destruction of residential property in Fitzroy street as the business extended back into Fitzroy street.

### **5.5 Data Integrity**

While it is possible to inferentially identify mistakes in street address from family reconstruction (Hood 2001), tracing properties offers a new means of ensuring the integrity of the data. An unexpected result of the Neighbourhood reconstruction was the identification of scanning errors among the addresses of the electoral roll. Where an individual appeared at an address for which there was no other records, either in that year or surrounding years, this is suggestive of an error in address. These individuals are often present at a location with an address similar in form to the nonexistent one in other sources, confirming the nature of the error.

## **6 CONCLUSION**

Social space is a dynamic, interrelated space. By making the relationships explicit, they can be drawn on in computer based modelling environments. Comparison of the abstract relationships allows conclusions about the component members of the relationship to be made.

These conclusions cannot be made on the basis of the constituent members of the network, they are a product of the broad social network itself. Drawing out the relationships between people and place provides a way of implicitly following continuities of social objects with a spatial dimension. Houses, in their guise of homes, can be traced through the different labels they may be referred to across time.

Modelling the social relationship also enables those members of the network that violate the implicit rules of the relationship to be identified. This provides an automatic flagging of potential errors in the datasets used to construct the model.

Analysis of social space in terms of the broader social relationships that imbue it, facilitates analysis not possible when considering the individuals and properties in isolation. Drawing out relationships reflects that with socio-historical data, as with society generally, the whole is greater than the sum of its parts.

## **ACKNOWLEDGEMENTS**

Since 1995 the Caversham Project, or now formally 'Sites of gender: opportunity and community in an emergent urban-industrial society 1893–1940', has been funded by the Foundation for Research, Science and Technology. This support has permitted a dramatic expansion in scope of, and number of records held by, the project.

## **REFERENCES**

- Hood, D. (2001) Imaginary Knitting. Historical record linkage in the Caversham project. *Proceedings of Computing Arts: Digital Resources for Research in the Humanities*, the University of Sydney, Sydney, Australia, 26 - 28 September. Accessed 10 September, 2001. <http://www.otago.ac.nz/nzpg/caversham/files/knitting.pdf>
- Langren, G. (1992) *Time in Geographic Information Systems*, Taylor and Francis: London
- MacKay, D. and Cunningham, S.J. (2001) Automatic extraction of dates from historical documents. *Proceedings of Computing Arts: Digital Resources for Research in the Humanities*, the University of

Sydney, Sydney, Australia, 26 - 28 September. Accessed 10 September, 2001.  
[http://setis.library.usyd.edu.au/drrh2001/papers/mckay\\_cunningham.pdf](http://setis.library.usyd.edu.au/drrh2001/papers/mckay_cunningham.pdf)

Olssen, Erik (1995) *Building the new world : work, politics and society in Caversham 1880s-1920s*, Auckland University Press: Auckland

Moylan, B. (2001), Mapping Landscape Change: Space time Dynamics and Historical Periods, *Proceedings of GeoComputation 2001 the 6th International Conference on Geocomputation*, 24-26, September, 2001, Brisbane, Australia, David V. Pullar (editor)