

Historical GIS analysis of crime and criminality in Edwardian (1910-13) London: a multi-source approach

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Summary: Georeferencing historical data is a time consuming, error prone and challenging process, especially when locations of historical phenomena are inherently vague or imprecise. This paper develops several innovative methods and uses them to georeference archival sources, in the quest to create a spatial picture of crime/criminality in Edwardian (1910-13) London. The results demonstrate ways of mapping vague historical locations/place names at a local scale through qualitative and quantitative analysis of detailed historical map and textual sources. The conclusions illustrate how historical GIS can be used to analyse crime/criminal interactions and provide researchers with an improved understanding of this social phenomenon.

KEYWORDS: Historical GIS; Crime mapping; Georeferencing; Vagueness; Place names

1. Introduction

Historical sources are among the most unwieldy of datasets to map. Not only are there the likely errors made by those that produced the source, but there is also the inherent vagueness and incompleteness of recorded information to contend with. Moreover, when attempting to map information from historical sources using GIS, a further challenge is added – namely the difficulty in ascribing a precise geographical location. As Knowles (2008) argues "extracting geographical data from historical sources is analogous to data mining, but it is mining done with pickaxe and shovel at the rock face...". It is at the local level that mapping historical data becomes most complex, especially if the locations mentioned are imprecise or vague – such as the location of a crime. Moreover, place names change, or are lost forever due to human alterations of the landscape over time (Gregory and Ell, 2007) – introducing an additional layer of complexity to the task.

This paper presents the initial results of a novel GIS-based analysis of crime and criminality at a neighbourhood scale over the period 1910-13. Its motivation is to describe and analyse the relationship between the residence of criminals and the places at which crimes occurred in London. But this initial phase of research also seeks more generally to illustrate how vague historical phenomena (crimes/criminals) may be mapped using a variety of historical sources and methodologies to aid in georeferencing.

2. Background

Little is known about the spatial distribution of crime in Edwardian London, and possibly even less about the reality of where criminals resided, or where the police perceived criminality to be rife. The aim of this research is to uncover these spatial patterns at the local scale, by using a combination of court and newspaper records that contain references to locations of both crimes and where criminals lived. Most studies of historical crime usually refer to published official statistics to investigate crime trends (e.g. Gatrell, 1980; Godfrey, 2008), or focus on specific crimes (e.g. Gurr, 1981; Robb, 1992) or policing strategy (e.g. Porter, 1987; Shpayer-Makov, 2004; Emsley, 2009). But court and newspaper records can help to further our understanding of crime, criminality and policing because

they provide geographic information. This means that we can reconstruct a spatial picture of crime, enabling us to explore:

- a) The journey or distance to crime.
- b) The police perceptions of where criminals resided (i.e. those perceived by the police to be the 'criminals' who were detained, tried, and found not guilty).
- c) The spatial associations between criminality and other phenomena e.g. social status.
- d) The relationship between crime and the built environment.

To be clear, it is not intended to produce a complete spatial picture of crime in Edwardian London – the surviving archival material does not permit this. But by exploring these spatial phenomena at the local scale, a greater understanding of the nature of crime/criminality/policing during the Edwardian era can be produced. Furthermore, Rawlings (1999) argues that "history informs our understanding of the present and our expectations about the future", meaning historical crime studies can aid in better conceptualising the problem of contemporary crime, and help to fight it.

The initial phase of the research used the Old Bailey Proceedings and The Times newspaper as sources of information for cases of murder and violent theft, tried at the Old Bailey courthouse, during 1910-13. It was limited to these sources, offences and years, as well as to this court, so as to gain an understanding of the methodologies and challenges involved in georeferencing qualitative historical sources. Crime incident information in both sources is usually detailed, yet, the Old Bailey Proceedings "...are not full transcripts of everything said in court, and many types of information were regularly omitted..." (Old Bailey Online, 2011). Other sources, such as The Times newspaper, therefore need to be consulted to obtain as much of this missing information as possible. Crucially, both of these sources combined provide information about where a crime occurred, and/or where the criminal lived. Nevertheless, the locations provided are sometimes vague and difficult to locate on maps.

Table 1 details the georeferencing issues that were identified during an initial assessment of these two sources. They suggest that maps alone cannot help to georeference qualitative historical records of

Table 1. The challenges of georeferencing qualitative historical records of crime

<i>Challenges</i>	<i>Why it is a challenge to georeference</i>
1. Building or street physically changes.	Cannot use modern mapping to locate crimes/criminals.
2. Street name or numbering system changes.	Cannot use modern mapping to locate all crimes/criminals. Historical mapping pre-1950 does not indicate house or building numbers.
3. Crime occurred in an ambiguous space in a street.	Need to be able to visualise all the physical features described in a crime report in order to georeference it. Historical mapping is not detailed enough to locate these features.
4. Crime occurred in a shop or business premises.	Modern and historical maps rarely show names of shops or businesses.
5. Inconsistency between the accounts provided by the offender, victim or witness.	All this information may need to be recorded, which is time consuming.
6. Large amount of geographical information to collect if crime location is ambiguous.	Time consuming to record, and information may be missed.

crime – other sources of information are required. It also indicates that where crime locations are vague or ambiguous in the records, a large amount of information would need to be recorded. To avoid this, it was necessary that assignment of georeferences was an integral task of data collection. This meant that sources required for georeferencing needed to be accessible when collecting data, and had to be in either a digital or other portable format.

3. Sources and methodology

3.1 Crime and criminality

Both the Old Bailey Court Proceedings and Times Newspaper have been digitised and transcribed to create searchable online databases. The Old Bailey or Central Criminal Court dealt with the most serious cases of crime committed in London and Middlesex (Bentley, 1998) and the proceedings detail its trials. The Old Bailey Online search engine provides the ability to search by offence or verdict, as well as to find keywords within the trial document text. Thus the versatility of this search engine enabled every court record for murder and violent theft during 1910-13 to be found.

The Times newspaper reported on incidents of crime, as well as trials held at the Old Bailey and at other courts in Britain. Due to the wide variety of subjects/topics on which the paper reported, as well as its national/international coverage, the search engine functionality for The Times Online Archive is not as flexible as the Old Bailey Online. It is not possible to limit searches to crime, or a place, but there is the ability to search for multiple terms.

Table 2 shows the information that was recorded for each crime, and the reasons for collecting it. At times it was not possible to obtain all of this information from a single report – and therefore a process of cross-referencing between the two sources was used to fill lacunas in the database e.g. searching for the offender's or victim's name. Criminal addresses and crime locations were georeferenced onto historical mapping during data collection using a number of historical sources and methodologies.

Table 2. Information collected for each crime

<i>Information</i>	<i>Why it was collected</i>
1. Crime type	To classify crime.
2. Date of crime	Used for cross-referencing purposes.
3. Offender's name, age, occupation, previous offences and home address	Used to explore the criminal demographic and background.
4. Victim's name, age and occupation	Used to explore the victim demographic.
5. Location of the crime	To georeference.
6. Verdict	Used to ascertain police tactics and perceptions on how to identify criminals. It may also provide an insight into the court process.
7. Date when report was published	For future reference.

3.2 Georeferencing

Several contemporary and historical map/textual sources are available to researchers to aid in the georeferencing of locations in Edwardian London (Table 3). Perhaps the most useful of these is the Ordnance Survey and free online mapping available at a variety of scales, covering a period from 1880 to 2011. They were used to identify streets, house numbers and building locations (e.g. pubs, post offices) in which crimes/criminality occurred. Additionally, where no explicit location was provided, these maps aided in identifying features that were mentioned in reports, such as public urinals, post boxes, bridges and jetties. However, the most detailed mapping (with house numbering) is only available for the 1950s onwards, by which time the numbering system changed in some streets and houses had been built/demolished as a result of regeneration or the Blitz. Hence, other sources were required to locate these addresses.

The 1911 Census enumerator summary books and sketch maps were used in conjunction with historic OS maps to find crime/criminal locations. By using the sketch maps/descriptions of the enumerator(s) walk with the census summary pages (that list the house numbers) and OS maps, it was possible to reconstruct the Edwardian house numbering system, as well as resolve cases where streets had been renamed over time. It allowed the precise address locations to be assigned to the records. However, in order to find business premises, historical directories had to be used instead, since the Census rarely provides shop/business premise names. Combining historical OS maps with the directories enabled crimes that occurred in commercial premises to be located. However, the problem with directories is that "...they were severely biased towards businesses and middle-status households, with many working-class areas being totally excluded" (Oliver, 1964 in Pooley, 1979) – which is why they could not be used as a substitute for census material.

Using a combination of these 'georeferencing sources', it was possible to obtain a fairly accurate location of where a crime took place, or where the offender lived. In turn, this enabled spatial patterns of crime and criminality to be analysed and interpreted using GIS.

Table 3. Sources to aid in georeferencing crime

<i>Source</i>	<i>Contemporary/Historical</i>	<i>Available online/access</i>
Ordnance Survey maps	Contemporary and Historical	Yes (institutional access)
Online mapping	Contemporary	Yes (free)
Census enumerators' summary books	Historical	Yes (subscription)
Directories (Post Office, Kelly's)	Historical	Yes (free)

4. Implications

Overall, this research builds upon the ideas of Cooper and Gregory (2011) who discuss how GIS may be used to map qualitative historical data sources. Both newspaper and court records often provide vague locations for where crimes occurred or where criminals lived, and therefore for these types of qualitative sources, methodologies have to be created or adapted to obtain georeferences. The next phase of this research aims to collect data on a much wider variety of crimes, as well as to use other sources to improve the spatial picture of Edwardian crime and criminality in London.

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