

The Computational Turn: GIScience and the Holocaust.

**Tim Cole, University of Bristol (with Alberto Giordano, Texas State University,
San Marcos)**

The Holocaust was a profoundly geographical event, involving the spatial separation of populations, mass population transfers and human dislocation on a vast scale. However, this spatiality has been relatively understudied. (Charlesworth 1992; Cole & Smith 1995; Golan 2002; Cole 2003; Flint 2005) In order to explore the potential of drawing upon the methodologies of GIScience (Geographic Information Science) to visualise and interpret the Holocaust, a research workshop (co-ordinated by Tim Cole, Alberto Giordano & Anne Kelly Knowles) was held at the Center for Advanced Holocaust Studies at the United States Holocaust Memorial Museum (Washington, DC) in August 2007. This drew together historical geographers, GIScientists, dynamic cartographers, historians and architectural historians to examine the ways in which geographical techniques, and specifically GIScience and dynamic cartography might inspire new research questions.

For many of us from the humanities, this collaborative working across traditional disciplines was a new experience and challenge: ‘at times this approach felt a little like interspecies communication,’ given that GIScience tools (Geographical Information Systems, or GIS, and computer mapping applications) and methodologies were unfamiliar to most of the participating historians, myself included. (Beorn et. al. 2009) Initially at least, methodological barriers appeared high. One central issue that quickly arose was the problem of matching the ‘messy’ nature of historical evidence (replete with its unknowns) with the demands for ‘accuracy’ that GIScience works

with. In particular, the representational model employed by the GIS assumes that each feature represented has a unique location defined by a set of geographical coordinates. This representational model is derived from the map. The uncertainty often associated with the precise location of historical events implies that the issue of metadata—that is, the description of how data were collected, from what source, who collected them, etc.—is of critical importance when using GIScience tools and methodologies to study history. The questions of metadata that became central to our discussions during the 2007 workshop have continued in our post-workshop collaborative research. A further initial issue, that has continued to form the basis of discussion, was whether, and if so, how, to quantify (and visualize) qualitative data such as survivor testimonies. However despite disciplinary differences, the experience of a team-based approach to research that we developed during the workshop, pointed to the tremendous potential of collaborative work between geographers and historians framed around using GIScience to interrogate the spatiality of the Holocaust. (Beorn et. al. 2009)

On the back of this successful workshop, the team (led by Giordano & Kelly Knowles) attracted NSF funding for a two year project (2008-2010) to further explore the potential for geospatial methods to analyze and represent social structures, human experience and landscape change over time through four empirically rooted inter-linked research projects that operate at a variety of the geographical scales from the macro to the micro. Research ranges from the continental (examining the evolution of the spatial system of concentration camps between 1933-45) through the national (the mapping over time and space of victim transports from France and Italy) to the regional (the geovisualization of forced evacuations (or so-called ‘death marches’)

from concentration camps at the end of the war) and on to the local (and the construction of a historical GIS of the Budapest ghetto). Regular team meetings mean that there is ongoing interchange between the collaborative research team as a whole, to allow for the sharing of findings and methodologies. The collaborative approach that lay at the heart of the initial research workshop and underpins the NSF research project, continues in each individual case study which brings together one or more historian/architectural historian with a cartographer/geo-visualiser/GIScientist. The remainder of this paper are brief reflections upon the challenges and possibilities of the computational turn in the humanities, framed around my own experience of ongoing collaborative research constructing and using an historical GIS of the Budapest ghetto.

Case Study – Constructing and using an historical GIS of the Budapest Ghetto

(Collaboration between Tim Cole, School of Humanities, University of Bristol and Alberto Giordano, Department of Geography, Texas State University, San Marcos)

In their overview of historical GIS, Gregory and Healey (2007) identify three principal ways in which GIS can contribute to historical geography: ‘the creation and dissemination of historical GIS databases, the use of GIS to perform quantitative and qualitative analyses and [addressing] the underlying conceptual issues in GIS.’ All three of these goals lie at the heart of the historical GIS of the Budapest Ghetto project. Working with two graduate students at Texas State University, San Marcos, we have created a historical GIS of the process of ghettoization undertaken in

Budapest in 1944. Ghettoization in this particular place was rather unusual. Across Europe, ghetto boundaries were subject to sometimes frequent changes (Cole 2009; Engelking & Leociak 2009). In Budapest, this was more marked with initial plans for seven ghetto areas across the area in May 1944 shelved and replaced with a far more dispersed form of ghettoization. On 16 June 1944, over 2600 houses were identified as ghetto houses. This number was reduced on 22 June 1944, to just over 1900. At the end of November 1944, the shape of the ghetto in the city changed again, with a single closed ghetto being created in the traditional Jewish quarter on the Pest side of the river, along with a more dispersed run of ghetto houses that formed an ‘International ghetto’ on the banks of the river Danube where Jews protected by the neutral powers were housed (Cole 2003) The historical GIS contains all of the addresses where Jews were housed in these various permutations of ghettoization in 1944, allowing spatio-temporal patterns to be identified. In addition, it maps out those public places (bars, restaurants, cinemas, bath houses etc.) that Jews were permitted to frequent in May-June 1944, when the national and local authorities divided public space along racial lines (Cole 2003).

These processes of dividing public space and residential properties between Jews and non-Jews are something that I have written about in previous work (Cole & Smith 1995; Cole 2003). However, working with Giordano and his team at Texas State in developing an historical GIS of the Budapest ghetto allows me to return to earlier work and revisit and build upon my original findings through utilizing collaborative research in the digital humanities. The dynamic nature of geovisualization and spatial analysis in answering and generating research questions can be seen in the construction, and current, analysis of the historical GIS of the Budapest ghetto. From

my earlier work (Cole 2003), and my introduction to the methodologies of GIS at the initial research workshop, I was keen to map out the changing shape of ghettoization to uncover spatio-temporal patterns that might uncover how and why ghettoization in this city changed so markedly.

For a historian of the Holocaust, it is the second of contributions of GIS signalled by Gregory and Healey (2007) - 'the use of GIS to perform quantitative and qualitative analyses' – that is of particular interest. My concern revolves around the potential of GIS to uncover spatio-temporal patterns that both answer existing research questions, as well as stimulating entirely new research questions. Here spatial analysis and geovisualization become research process and not simply research product. Alongside uncovering spatio-temporal patterns, hard (if not impossible) to see when working simply with the textual sources (eg lists of addresses in alphabetical order on wartime wall posters), GIS allows for tools such as spatial statistics, network analysis and cluster analysis to be utilised. More specifically, in the context of the Budapest ghetto project, we are using spatial analytical methods, specifically spatial statistics and network analysis, to study how the ghettoization process alternated between concentration and dispersion and how Jews were moved from one part of the city to others. The employment of spatial analytical techniques allows us to quantify how, when, and to what extent the ghettoization process created spaces of presence and spaces of absence of Jews in Budapest.

But the construction of an historical GIS of the Budapest ghetto has also raised new research questions, in particular relating to victim's shifting experiences of

ghettoization. The GIS is constructed to allow for measurement of the distance between points along streets. Given what we know about the operation of the curfew in Budapest during the period of relatively dispersed ghettoization (June-November 1944), this allows us to identify the ‘invisible walls’ that separated Jews from other Jews (and a variety of other amenities/contacts). Ghettoization is traditionally thought of in terms of the spatial separation of Jews and non-Jews, but the GIS suggests that in its dispersed form, it also led to the spatial separation of Jews from other Jews. Moreover, network analysis provides a means to assess the relative accessibility and inaccessibility of such crucial places in the city as the Swedish Legation (issuing protective passes in the second half of 1944) to Jews living in different places.

The question of who could access the protection of the neutral negotiations, and so the place of the ‘International Ghetto’ is one central concern in the research. Alongside the historical GIS, a data base of over 6000 Jews on the initial Swedish list of protected persons allows for analysis of who gained protection in terms of age, gender, address (which hints at class), familial status etc. Here, the project makes a major intervention in the existing historiography, by pointing to how unrepresentative those of the Swedish list were, in particular in regard to their wartime addresses in the city (Palosuo 2008; Levine 2010). Here, spatial patterns have been uncovered which form the basis for ongoing current research.

Alongside spatial analysis and geovisualization answering, and raising, questions about perpetrator motivations and victim experiences, mapping ghettoization raises questions about the visibility and hiddenness of the ghetto over time to bystanders – perhaps the most understudied of groups in Holocaust historiography (Ehrenreich &

Cole 2005). In particular, working with the location of major tram routes through the city, or central public buildings such as markets, we examine what bystanders saw, where and when, and how far the ghetto was integrated into the urban landscape.

More broadly, as we found in our earlier discussions (Beorn et. al. 2007) the project raises methodological and representational questions related to the application of geospatial techniques and geovisualization to historical events more generally, and this historical event in particular. These range from the methodological – in particular centred around the integration of the qualitative and quantitative approaches – through the ethical. An important component of our research team’s work, including the Budapest ghetto historical GIS, is the issue of metadata. Using data from the Budapest GIS and from another historical GIS we are building of the Holocaust in Italy, we are systematically evaluating geographical metadata standards and archival metadata standards to develop a model that incorporate elements from the two families of standards and proposes a new metadata standard that can be employed in historical GIS projects.

Key to ongoing discussion is how to work with individual stories generated in the kind of qualitative approach represented by oral history alongside the more quantitative sources demanded by GIS, as well as how to map out and visualize individual experiences. This points to a broader challenge within the digital humanities: how to integrate and analyze oral history, without turning it, in Geoffrey Hartman’s memorable words, into ‘memory.com’ and ‘tele-suffering.’ (2000) Here is a broader issue (perhaps one that historians of the Holocaust are particularly sensitive to) – that of the how to integrate technology into research in the arts and humanities.

How can we apply GIScience methodology without reducing human subjects to objects of research? And given the role that cartography and geovisualization plays in the project – and in particular in the research products – are we in danger of aestheticizing human suffering? How to map and visualize human suffering without reducing it to the ‘prettiest’ pictures we can generate, remains an ongoing challenge as we turn our thinking from the original stage of conceptualizing the project and building the historical GIS, to year two when we are undertaking the final analysis and thinking more about the paper and web-based products that form the outputs of the research.

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