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## The proactive historian: Methodological opportunities presented by the new archives documenting genomics



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### ABSTRACT

In this paper, I propose a strategy for navigating newly available archives in the study of late-twentieth century genomics. I demonstrate that the alleged ‘explosion of data’ characteristic of genomics—and of contemporary science in general—is not a new problem and that historians of earlier periods have dealt with information overload by relying on the ‘perspective of time’: the filtering effect the passage of time naturally exerts on both sources and memories. I argue that this reliance on the selective capacity of time results in inheriting archives curated by others and, consequently, poses the risk of reifying ahistorical scientific discourses. Through a preliminary examination of archives documenting early attempts at mapping and sequencing the human genome, I propose an alternative approach, in which historians proactively problematize and improve available sources. This approach provides historians with a voice in the socio-political management of scientific heritage and advances methodological innovations in the use of oral histories. It also provides a narrative framework in which to address big science initiatives by following second order administrators, rather than individual scientists. The new genomic archives thus represent an opportunity for historians to take an active role in current debates concerning ‘big data’ and critically embed the humanities in pressing global problems.

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### 1. Introduction

The website of the Arts and Humanities Research Council leads applicants to a guide that details a stipulation for history proposals: when projects address events “within the last thirty years,” they should explicitly demonstrate “why their focus is indeed predominantly historical rather than contemporary.” The public British funder appears concerned that the scarcity of archival evidence and other accepted historical sources for this period might lead applicants to embrace the contemporary and exclusively frame their projects within the social sciences, funding for which is the province of another institution, the Economic and Social Research Council. Despite flexibility in many of their overlapping research areas, regulations appear stricter in relation to historical research.<sup>1</sup> This largely chronological demarcation criterion reflects an

aversion held by some historians towards the recent past, in part motivated by a desire to defend their disciplinary independence and distinguish their methodology from other more present-oriented fields of the social sciences (Goldthorpe, 1991).

A preference for the distant past over more recent times has informed many seminal works in the history of science. The majority of classical post-World War II literature has been concerned with the scientific revolution of the seventeenth century, a focus on the early-modern period prevailing in history of science research up until the late 1980s.<sup>2</sup> The view among the community at that time was—and in some cases still is—that the *perspective of time* would facilitate an accurate historical reconstruction of the case

<sup>2</sup> Examples of classical literature on the history of science, written after World War II and focused on different aspects of the early modern period are Butterfield, 1997 [1949] and Koyré, 1957. Most historiography in the 1970s and 80s revisited the episodes narrated in earlier works and, by incorporating sociological perspectives, questioned the notion of a ‘scientific revolution’ in that period: Shapin & Schaffer (1985) and Cunningham (1988).

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<sup>1</sup> See <http://www.ahrc.ac.uk/documents/guides/ahrc-s-subject-coverage/>, p.2, quote under heading “History”. Last accessed September 2015.

studies selected. This commitment to the past as opposed to the present increasingly differentiated the sources, theoretical frameworks and methodological approaches of the history of science within the broader field of Science and Technology Studies (STS) (Daston, 2009).

From the 1990s onwards, however, historians began to debate the advantages of addressing the more recent scientific past. The importance of developments within science and technology during the twentieth century, and the intellectual stimulus provided by engaging with living scientists, employing interviewing and other innovative social science tools, appealed to a substantial part of the community. This was to a large extent fostered by the incorporation of ethnographic approaches to the analysis of historical case studies, which gradually spurred researchers towards more contemporary science (Dear & Jasanoff, 2010). The historiography turned to issues relating to World War I and II, the formation of university–industrial complexes and the scientific and socio-political orders following 1945 (Edgerton, 1992; Edwards, 1997; Lesch, 2000, among others). This coincided with a shift of emphasis from the history of physics to the history of the life sciences and a growing interest in the emergence of big science models (Doel & Söderqvist, 2006; Galison & Hevly, 1992; Kevles & Geison, 1995).

The increasing focus on contemporary science provoked a number of theoretical and methodological debates among historians. Thomas Söderqvist, an early advocate of tackling the recent past, justified his position with the claim that “the bulk of scientific activity in world history” had taken place “in the last half century.” The vast increase in working scientists, publications and meetings since the mid 1940s was producing a gold mine for historical research. According to Söderqvist, the lack of archives would be counterbalanced by an abundance of published material, opportunities to conduct oral histories, and the subsequent collection of unpublished records still in scientists’ possession. This plurality of sources represented a unique situation and was transforming the practice of history: from reliance on an alleged scarcity of materials to an overabundance of records (Söderqvist, 1997: 2).

The historiography of molecular biology is an example of these changes in research practice. Beginning in the 1980s and ‘90s, a time at which most molecular biologists were still alive, historians compensated for the lack of traditional sources with interviews and creative ways of cooperating with scientists (de Chadarevian, 1996; Holmes, 2001; Kay, 2000). This led to the identification of an increasing amount of unpublished material, most of which was subsequently acquired by libraries and made accessible in the form of catalogued archives. Historical research on contemporary biomedicine has continued, addressing not only the classical stages of molecular biology—the 1950s and ‘60s—but also the more recent development of recombinant DNA methods, as well as the mapping and sequencing of genes (Brandt, 2013; García-Sancho, 2012a; Hogan, 2014; Onaga, 2014; Pierrel, 2012; Rheinberger & Gaudillière 2004; Stevens, 2013; Yi, 2008). This has resulted in newly discovered archival collections being made available to scholars.<sup>3</sup>

In this paper, I will address these newly released collections and the horizons they open for the study of recent science; recombinant

DNA was developed in the mid 1970s, and the first genome mapping and sequencing projects were proposed in the mid 1980s. While acknowledging the unique situation for historical research these new archives have created, I will argue that this uniqueness does not lie in the situation being novel or specific to the history of recent science: rather, it lies in the unprecedented opportunity for historians to be involved in the filtering and organising of available sources, in cooperation with archivists as well as scientists.

Soraya de Chadarevian has claimed that every historian of the recent past is to some degree an archivist. By interacting with living actors and retrieving records before they are publicly released, these historians construct the heritage that will be transmitted to future generations (de Chadarevian, 2013b, 2016). The reverse may be said for archivists of recent unpublished materials. As Jenny Shaw argues in another contribution to this special issue, they become engaged with the stories those materials tell as they are archived (Shaw, 2016). These categories of ‘the historian’ and ‘the archivist’ may be seen as generalisations that mask the diversity of narratives different types of historians and archivists produce. However, they also show the interests historians and archivists share and suggest ways these actors may fruitfully interact.

In what follows, I will use the term *historians* as an intentionally idealised category that designates scholars producing a “second order” narration of the past. In line with earlier historiography (Abir-Am, 1985; Suárez-Díaz, 2010), I will argue that when this narration differs from the first order accounts of actors involved in the events, historians escape the pretence of objectivity and critically engage with their sources, in order to independently reconstruct the past. This *proactive historian* seeking to rearrange sources may find an invaluable ally in the archivist attempting to make autonomous sense of the same records. By building on these categories, I will propose a way of collaboratively exploiting the newly available archives.

The opportunity for collaboration coexists with a growing political interest in ‘big data’. Nationally and internationally, public and private funding agencies are seeking strategies to make sense of the increasing volume of information which scientists, and society in general, have to deal with in everyday life. New information technologies and the mega-projects characteristic of big science are creating an overwhelming amount of data which is difficult to digest.<sup>4</sup> At the same time, funding programmes are calling for scholars within the humanities and social sciences to abandon their academic niches and embed themselves in problems such as ‘big data’, which transcend boundaries with the natural sciences. This has raised concerns over whether the proposed embeddedness represents a threat to the independence of the social sciences and humanities, and subordination to the interests of the natural sciences.<sup>5</sup> I will demonstrate that if historians actively engage with the

<sup>3</sup> The early molecular biology collections comprise, among others, the Papers and Correspondence of Francis Crick (Wellcome Library, London), Max Perutz (Churchill College, Cambridge), John Kendrew (Bodleian Library, Oxford) and the Rockefeller Archive Centre in New York. Newer collections include *Codebreakers: Makers of Modern Genetics* (Wellcome Library and Cold Spring Harbor Archives, New York), the Papers and Correspondence of Sir Walter and Julia Bodmer (Bodleian Library) the Robert Cook-Deegan Human Genome Archive (Georgetown University, Washington DC), the Papers and Correspondence of A.D. Kaiser and Paul Berg (Stanford University Archive) and the *Towards Dolly* project (University of Edinburgh, Centre for Research Collections).

<sup>4</sup> Big data has become a priority for the UK Government and a privileged focus area of its seven research councils: <http://www.rcuk.ac.uk/research/infrastructure/big-data/>; see also <https://www.gov.uk/government/news/73-million-to-improve-access-to-data-and-drive-innovation>. In line with this commitment, all major scientific funders in Britain demand open access to the data and outputs derived from the research they support: <http://www.rcuk.ac.uk/research/openaccess/>; <http://www.wellcome.ac.uk/About-us/Policy/Policy-and-position-statements/WTD002766.htm>. All links last accessed September 2015.

<sup>5</sup> The idea of embedding the social sciences and humanities in broader problems is best expressed in Horizon 2020, the research programme of the European Union. This programme, rather than creating specific research areas, defines a number of “societal challenges”—such as ageing, innovation or climate change—that require interdisciplinary work across the humanities, social sciences and natural sciences: <http://horizons.mr.uni.eu/vilnius-declaration-horizons-for-social-sciences-and-humanities/>; see also [http://europa.eu/rapid/press-release\\_SPEECH-13-740\\_en.htm](http://europa.eu/rapid/press-release_SPEECH-13-740_en.htm). Both links last accessed April 2015. For academic debates around the idea of embeddedness, see Calvert (2014), Felt (2014), and Levidow (2014).

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