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Citation for published version (APA):

Olesen, C. G. (2017). Film history in the making: Film historiography, digitised archives and digital research dispositifs.

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Download date: 22 Jan 2020
4.0 Writing Film History From Below and Seeing it from Above: Data Mining, GIS Mapping and Socio-Economic Cinema History

In this chapter I switch focus from stylometry’s microscopic perspective to historical GIS and digital cartography’s macroscopic vantage point as they have developed in the past approximately ten years in the research field of New Cinema History. This field fundamentally questions the film-centric focus of style history and New Film History to instead study patterns of cinema exhibition, distribution and reception from a macro-historical perspective. To this end, rather than finding its hermeneutical antecedents primarily in film and media studies, it draws on interdisciplinary approaches in socio-economic history and *Annales* historiography in particular. Drawing on such approaches, New Cinema History has in recent years increasingly been developing cartographic representational practices for historical visual analytics. In this process, it has integrated GIS methods and techniques conceived in the earth sciences and (human) geography into the film historian's toolkit. As in Chapter 3, I analyse these methods and techniques' operations step-wise to elucidate their emergence’s scientific context and the epistemological discussions surrounding their trajectory from the natural sciences to film studies.

The chapter falls into three parts. Part One, “From Film to Cinema History”, characterises the distinguishing features which set New Cinema History apart from New Film History by discussing its conceptual and methodological engagement with *Annales* model(s) of history and quantitative methods. Part one first attends to how *Annales* concepts such as “total history” and “mentality” underpin the pre-constitution of New Cinema History's analytical object - cinema instead of film - and its contextual focus on distribution, cinema-going, exhibition patterns and networks. Extending on this discussion, I here also reflect upon the central role of computational methods and databases in the quantitative analysis of patterns in film-related historical sources. I sketch the development and epistemological discussions surrounding historical computation - from the 1960s’ punched-card based methods in Cliometrics to data mining in the Digital Humanities – in order to elucidate how new cinema historians transcribe, organise and process historical data as the basis for network analysis and cartographic representations.

The chapter's second part, “Negotiating the Map as Evidence in New Cinema History” analyses the technical and graphical features of New Cinema History's cartographic representations. Attending to New Cinema History's foundations in *Annales* historiography, I discuss this historical research field’s deployments of historical GIS, and its negotiations of techniques and methods
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originating in the earth sciences and (human) geography. Specifically, I focus on how these techniques and methods travel into and acquire an evidentiary function in New Cinema History as ways for studying the spatial relations of events and agents using data extracted from film-related sources in local and regional historical archives. I have organised this section so as to reflect a *pas de deux* between epistemological discussions of GIS in the sciences and (human) geography and in New Cinema History; first, I discuss a key concept or concern in the former disciplines to, then, examine its application and/or appropriation within the latter. The section in particular attends to debates surrounding the representation of historical temporality and data ambiguity in GIS visualisations, while subsequently considering how new cinema historians position themselves in these debates. This analysis is substantiated by discussions of a number of key examples of recent projects and a case study. As key examples which are particularly illustrative of how said features of GIS visualisations are negotiated in New Cinema History, I have chosen to focus on Robert C. Allen's *Going to the Show* and the Universities of Glasgow and Edinburgh's *Early Cinema in Scotland*, because they are among the most advanced projects in the field. The chapter's central case study is the GIS-based project *Data-driven Film History: a demonstrator of EYE's Jean Desmet Collection* based at the University of Amsterdam, which set out to map the distribution of the films held in EYE Filmmuseum's Desmet collection, in which I was involved as project manager and researcher. In this case study, I discuss in hindsight, from an insider's perspective how the project followed New Cinema History research practices to tackle issues of spatio-temporal representation of distribution and exhibition patterns, while reflecting on the project interface's representation of data ambiguity. A particularly important reason to focus on this case was that I could consider the tool's making from a builder's perspective, in the sense suggested by Stephen Ramsay, as a hermeneutical process that fosters different insights into and perspectives on established procedures' possibilities and limitations.658

In the third part, “From Film History to Cinema History and Back Again? Analysing Chromatic Patterns in Desmet’s Programs” I discuss a tentative visualisation experiment with ImageJ techniques for colour analysis, applied to films in the *Data-driven Film History*-project. With this experiment the project wished to suggest possible approaches for analysing interrelations between textual features and film exhibition. This project component sought to challenge the predominantly contextual focus of New Cinema History and reflect to a greater degree the textual focus of New Film History in a GIS-based research format. This reflected a need among the participants to

question whether we do not lose valuable, historical insights into the film medium's development by leaving behind textual analysis altogether for a predominant focus on film-related sources.

Conclusively, as in Chapter 3, I outline the methodological steps of new cinema history's cartographic dispositif and describe the interactions between the scholar, the machinery and the representations they create to qualify its epistemology. Moreover, the chapter finishes with a critical suggestion on how new cinema historians may further develop their engagement with Annales historiography as a way of indicating new possible research avenues. As I will suggest in this final section, GIS-based New Cinema History may develop a longue durée perspective to an even greater degree by going beyond primarily cinema's silent years to also map its centuries-long emergence and roots in established conventions of projection and exhibition from before cinema.

4.1 From New Film History to New Cinema History

At the core of New Cinema History’s theoretical alliance with Annales historiography lies a problematisation of the predominant focus on film as analytical object in style history and New Film History. New cinema historians regard these research traditions as attributing far too great importance to films as historical sources which allow for developing insights into popular conceptions of the medium and societal developments. They consider textual analysis problematic insofar as it neglects how cinema was woven into the fabric of cinema-goers' everyday life outside of the cinema screening or production context. This focus, they contend, fails to recognise broader, constitutive patterns of use and consumption, in particular with regard to cinema culture's intertwining with infrastructures of transportation and trade, which they consider essential for understanding cinema's historical development and societal implications. As Richard Maltby argues, it is problematic when historians of film style single out and regard key titles as representative of significant stylistic developments, changes in spectatorial habits, film cognition or as emblematising the zeitgeist of entire periods. As he writes:

When this zeitgeist analysis of individual films aggregates into the study of filmic phenomena (histories of genres, authors or national cinemas, or films on particular topics and so on), the result is a series of compartmentalised thematic accounts largely detached from the circumstances of their consumption, and yet heavily dependent for their significance on the assumption that these textual encodings would have some kind of social or cultural effect.

660 Ibid., 7.
Maltby’s critique rests on the observation that stylistic history, as he phrases it, has a “genetic inheritance from literary analysis” in which the contemplation of textual structures in limited film corpora can hardly be considered representative of contemporary, cultural attitudes of neither production nor spectatorship.\(^{661}\) This remark reflects new cinema historians’ unifying goal to move away from style history's textual focus on era- or genre-defining films to socio-economic history's contextual analysis of consumption, distribution and exhibition, relying primarily on film-related sources as a primary empirical fundament.

As discussed in Chapter One, this shift in empirical basis, and the historiography it gave rise to, was broadly labelled New Film History in the 1980s. Yet, New Cinema History, which finds its model in this period's reference literature – in particular Allen and Gomery’s *Film History: Theory and Practice* - should be regarded as encompassing a more recent methodological development which distinguishes itself from and extends its critiques of textual analysis to comprise New Film History itself. In particular, it sets itself apart from New Film History's culturalist and apparatus-theoretical approaches to especially early cinema's performative, intermedial conventions, as propagated by Gunning, Musser and Gaudreault. It finds that this analytical focus essentially remains text-centric because its primary concern lies in discerning structural relations between film-texts, screening spaces and performance focusing on the mediating agents between screen and audience – as in the emblematic case of *Life of an American Fireman*. In this regard, new cinema historians argue that New Film History, in spite of its model's attention to film-related sources and screening contexts, did not go far enough in engaging with socio-economic history's methods. Maltby's argumentation reflects this when it problematises a note of caution made by one of its key figures, Charles Musser, which expresses the concern that giving up films as primary objects of study altogether will give way to a “broader and more amorphous cultural and social history” belonging to other scholarly fields of historical inquiry.\(^{662}\) As I discuss in more depth in the following sections, Musser’s concern that the film-text altogether disappears as an object of study does not resonate widely with new cinema historians. On the contrary, they consider increased interdisciplinarity as enabling them to conceive cinema as an object of study more adequately by introducing methods from other disciplines. Their approach’s denominator - New Cinema History as opposed to New Film History – reflects this by highlighting their main emphasis on contextual, film-related sources as a foundation for a socio-economic cinema history of consumption,

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\(^{661}\) Ibid.

\(^{662}\) Ibid., 9.
Moreover, and importantly, new cinema historians value interdisciplinarity because it offers them alternative formats for historical inquiry, in particular statistical and cartographic representations, which allow for discerning patterns which written prose cannot make visible. In this respect, New Cinema History closely aligns with the view on narrative forms of history which Allen and Gomery's historiography reflected. As they argued in *Film History*, narrative forms are not always the most suited for film history writing because they potentially obfuscate or simplify complex relations between historical agents. As they contended:

Organizing historical arguments as narratives (a chronological arrangement of events in a cause-effect relationship) is an accepted and frequently illuminating historical strategy. Because so much of film history is written exclusively as narrative, however, it should be pointed out that the qualities that make for a good story are not necessarily those that make for good history.\(^{663}\)

As I will discuss in the following sections, beyond the field of film and media history, this stance can be regarded as deeply indebted to *Annales* historiography's interdisciplinary tradition of using statistical and cartographic representations as alternatives to linear, written histories. Thus, by rereading Allen and Gomery to raise critiques of New Film History, new cinema historians retrospectively elicit fundamental epistemological differences in the approaches included under this header in the 1980s. This nurtures a bifurcation of historiographical approaches today into respectively New Film History and New Cinema History, which holds implications for the uses of analytical approaches and representational practices.

In the next sections, I will elucidate how New Cinema History intertwines with *Annales* historiography's scholarly tradition, by first focusing on how it lends concepts from it and subsequently how it adopts its analytical techniques and representational practices.

**New Cinema History and Annales Historiography**

To analyse cinema's intertwined history as an industry and everyday leisure activity, new cinema historians draw extensively on the key concepts and techniques of *Annales* historiography and their developments. This holds implications for how it positions itself as a scientific approach to media history and sets itself apart from both stylistic history and New Film History. To elucidate this methodological aspect of New Cinema History, I find it important to attend to two key tenets in

\(^{663}\) Robert C. Allen and Douglas Gomery, op.cit., 44.
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Annales history in particular. First, its interdisciplinarity, which is fundamental for its development of a total history model focused on “mentalities”. Second, its development of a “multi-scopic” approach, in particular in later years, which combines micro and macrohistorical perspectives to simultaneously focus on larger structures and everyday, anecdotal histories.

The historical review Annales d’histoire économique et sociale was founded in 1929 by Lucien Febvre and Marc Bloch, both scholars at the University of Strasbourg. Since its foundation, the review has developed interdisciplinary, socio-economic models of history, commonly referred to as Annales historiography, drawing on methods from especially the social sciences, anthropology and economy. From the outset, Annales historians have argued that historiography's norms and conventions should not be determined by a small group of authorised scholars, but instead open itself onto other disciplines to develop integrative, total histories.664 In a note to his key work The Historian’s Craft (first published as Apologie pour l’histoire ou Métier d’historien, Armand Colin 1949) which addressed historians at large, Marc Bloch encapsulated this ambition by contending that some of the most illustrious scientists in other disciplines had not been trained within their field. As he wrote:

…each science, taken separately, find its most successful craftsman among the refugees from neighboring areas. Pasteur, who renovated biology, was not a biologist – and during his lifetime he was often made to feel it; just as Durkheim, and Vidal de la Blache, the first a philosopher turned sociologist, the second a geographer, were neither among them ranked among licensed historians...665

Departing from this assertion, Annales historians held that interdisciplinary histories would nourish the development of a more comprehensive and integrative macro-history which would make visible how societal structures cut across different institutions and experiential realms and change subtly, rather than abruptly, over long time spans. This was seen as enabling historians to discover more profound structures outside of narrative event history’s narrowly defined causal chains, focus on individuals and limited corpora of source material.666 In this respect, historian Peter Burke has characterised Annales historiography as a “problem-oriented analytical history” which focuses on particular themes or aspects of society in opposition to “a traditional narrative of events”.667 This interdisciplinary model is also known as “total history”. As Annales historian André

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666 Peter Burke, op.cit., 10.

667 Ibid., 2.
Burguière has explained:

Total history can be understood, first and foremost, as the aspiration to conceptualize the multidimensionality of change by moving beyond the fragmentation of historical knowledge into a series of specialized domains (political, military, religious, economic, and so on) (...) being open as well to the other social sciences, to their concepts and problematics. This was the appeal made by the founders of the *Annales* for the decompartmentalization of research, for interdisciplinarity.\(^{668}\)

Total history arguably finds its most prominent articulation in Fernand Braudel’s work. In particular his essay on history's *longue durée*, which regarded Claude Lévi-Strauss’ linguistics-inspired structural anthropology as a productive new avenue for what he considered a stagnating History discipline.\(^{669}\) Furthermore, Braudel's key work *The Mediterranean and the Mediterranean World in the Age of Philip II* (first published in French as *La Méditerranée et le monde méditerranéen à l’époque de Philippe II*, Armand Colin 1949) equally reflected this ambition, by stressing how it relied on studies “written by specialists in neighbouring disciplines – anthropologists, geographers, botanists, geologists, technologists” to process its complex and multifaceted source material.\(^{670}\)

A key ambition of total history is to discern the psychosocial sentiment or mentality (*mentalité*) of societies in particular periods. Essentially, the concept of mentality seeks to understand how a collective consciousness manifests itself in generalised and, in particular, quantifiable modes of thinking, gestures and routines.\(^{671}\) The concept is however, as historian Jacques Le Goff underlines, deliberately ambiguous and should be seen as an invitation for historians to seek out methods from other fields in the human sciences.\(^{672}\) Yet, it can be said to distinguish itself from a history of ideas by analysing, through an interdisciplinary lens, how “mental life” is embedded in social and material processes.\(^{673}\) As I discussed in chapter one, in order to study such processes, *Annales* historiography attends to a multifarious array of sources, and only sparsely to cultural products as

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\(^{669}\) Fernand Braudel, op.cit., 1958, 9 and 10.


\(^{672}\) Jacques Le Goff, op.cit. 167.

signifiers of a period’s mentality. As Le Goff has contended, “the forms of and themes which are articulated in literature and art are not necessarily those of the collective consciousness”. Yet, *Annales* historians consider cultural expressions valuable expressions of mentality when studied with attention to their embeddedness in daily routines.

New Cinema History closely aligns with total history's interdisciplinarity, the concept of mentalities and its analytical focus. As Maltby emphasises, New Cinema History's “project [is] inherently interdisciplinary” and its “methods, particularly those involving computation, mapping and other forms of data visualisation, are collaborative”, seeing scholars from a wide array of disciplines contributing to the research field. This alignment holds implications for how new cinema historians attend to classic film historiography and reframe it within the conceptual frame of *Annales* historiography. In particular Jean Mitry's work is being refashioned by new cinema historians as a hermeneutical antecedent to New Cinema History which embodies a counterposition to textual analysis. As discussed in Chapter One, even though Jean Mitry's historiography largely reflected the early cinephile canon, its combined understanding of film as both an art form and industrial product shared affinities with Braudel's total history. In order to properly analyse the film medium's history within society, Mitry envisioned a historical model which - through an interdisciplinary lens – analysed how techniques, industrial developments, film form and content were “tied together by implications of an economical, psycho-social and cultural order”. For Mitry this implied challenging the masterpiece model by analysing larger corpora of films which were not necessarily held in critical esteem. As he phrased it: “It is a question of highlighting the part played by certain works with regard to the social or moral concerns they reflect…”, adding, “masterworks or not”.

While still suggesting primarily textual rather than contextual analysis as the basis for a psycho-social history, Mitry's emphasis is important to New Cinema Historians, who distinguish it from symptomatic readings of small corpora of films. For Maltby, an undesirable example of the latter can be discerned in another classic work and its use of films as sources of history, namely Siegfried

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674 Jacques Le Goff, op.cit., 174.
675 Richard Maltby, op.cit., 2011, 8 and 34.
677 Ibid., 113. Original full quote (emphasis in original): “Il s’agit de mettre en valeur l’apport particulier de certaines oeuvres en regard des inquiétudes morales ou sociales qu’elles reflètent: de définir comment et dans quelle mesure elles se sont influencées, en quoi elles ont contribué à la formation ou à l’évolution du langage filmique; de préciser enfin les causes de cette évolution: problèmes techniques ou économiques, recherches esthétiques, conditionnement du public influence des autres art ou des idéologies en cour. Et ceci à travers des films qui, chefs d’oeuvre ou non, ont contribué plus ou moins à cette évolution”.

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Kracauer’s *From Caligari to Hitler: A Psychological History of the German Film* (Princeton University Press, 1947). A canonical study in film theory and history, Kracauer's work read the rise of the nazi regime into the narrative patterns and psychological character motivations in a group of German films from Weimar Germany. By doing so, it has often been criticised for producing a top-down, symptomatic reading of the period's films to establish evidence for the claim that they showed how the German people’s soul was receptive to Nazi ideology.\(^{678}\) New cinema historians criticise such an approach by arguing that film's capacity to express the collective consciousness of an era is highly limited and that for this reason, the analysis of a few films creates a distorted picture.\(^{679}\) Along these lines, new cinema historians take the cue from Mitry to not only downplay textual analysis of masterpieces but abandon a key focus on style altogether in favour of contextual studies of exhibition and consumption based on film-related sources. They take Mitry's stance to reflect *Annales* historiography's concept of mentality insofar as it regards films as valuable historical sources for socio-economic histories primarily when analysed as cultural products embedded in ritualised everyday practices.

However, New Cinema History scholars do not orthodoxy follow *Annales* historiography's total history model as developed by the review's first two generations of scholars. Since especially the 1970s, total history's discernment of totalising structures has been critiqued for showing naively universalising aspirations and claims to comprehensiveness.\(^{680}\) Consequently, as Burguière boldly states, it has "[been] laid to rest as a monstrous and ridiculous chimera".\(^{681}\) This is particularly visible in how *Annales* historiography has in recent years complemented total history with small-scale, local histories of individuals or regions which counter universalism. It does so by integrating methods from especially microhistory, or *microstoria*, which emerged in the 1970s onwards. Epitomised in historian Carlo Ginzburg's study *The Cheese and the Worms: The Cosmos of a Sixteenth Century Miller* (first published as *Il formaggio e i vermi. Il cosmo di un mignaio nel ’500*, Einaudi 1976), microhistory's distinguishing feature is its smaller scale, or “cultural level”, of source material which is often delineated by a small region, town or individual.\(^{682}\) Whereas total history gives prevalence to and quantifies bureaucratic documents as source material – censuses,
accounts, bills – microhistory emphasises anecdotal, everyday testimonies found in personal archives, diary notes or memoirs which resist quantitative interpretation to establish a counter-perspective. Thus, in microhistory, the historian processes a small, manageable data amount, through exegetic and exhaustive close readings.

Combining total history and microhistory may initially seem counter-intuitive when considering their different analytical scopes, but they have become increasingly intertwined in recent years.683 For instance, as philosopher Paul Ricoeur has stressed, their combination allows to productively alternate between their different scales.684 As if switching between the optics of a microscope and a telescope, he argues, their scales produce different visibilities of qualitatively different causal chains.685 According to Ricoeur, the fundamental difference lies in the varying degrees of agency which they ascribe to people as individuals within total systems. As he writes:

In a general way, the history of mentalities, insofar as it had simply extended the macrohistorical models of economic history to social history and to phenomena of the ‘third type’, tended to deal with the concept of social pressure as an irresistible force operating in an unperceived fashion in relation to the reception of messages by social agents. The treatment of the relations between high and popular culture was particularly affected by this presupposition that goes with a reading that runs from the top to the bottom of the social scale.686

This critique holds that Annales historiography’s totalising perspective neglects forces of resistance that can occur on a micro-level. The microhistorical emphasis on personal sources serves to nuance and test inferences made on the macro-level. Along these lines, in recent decades Annales historians have, in what historian Paul-André Rosental has dubbed a “multi-scopic approach”, tended to combine these scales to let top-down and bottom-up perspectives critically inform each other through productive variations.687

Conceptually, New Cinema History reflects this development and incorporates the multi-scopic model Annales historiography has resulted in. Echoing Ricoeur’s proposition, Maltby has for instance remarked concerning Annales' study of mentalities that “[a]fter their heresy achieved

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683 Ibid., 212.
684 Ibid., 210.
685 Ibid., 211 & 212.
686 Ibid., 271.
From Annales' Serial History to Computer-Based New Cinema History

To understand how new cinema historians formalise computational practices into methodological

689 Jeffrey Klenotic, op.cit., 77.
692 Alexander von Lünen and Emmanuel Le Roy Ladurie, "Immobile History: An Interview with Emmanuel Le Roy Ladurie", in Alexander von Lünen and Charles Travis (eds.), History and GIS. Epistemologies, Considerations and Reflections. (Dordrecht, Heidelberg, New York, London: Springer, 2013) 19. As Ladurie comments in retrospect with regard to this remark: "Well, I mean... I shouldn’t have said that. Although I think that the final aim of history, if it is not a purely cultural history, is to be quantitative wherever it is possible; but that is the final aim, the validation, not all the research has to be quantitative... So I should not have said that".
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procedures, it is helpful, once again, to consider *Annales* historiography’s developments. As Ladurie’s discussion testifies to, throughout the 1960s and 1970s, the computer increasingly provided a basis for its quantitative methods, drawing on recent developments in historical research, especially in universities in the US. According to an estimate made by historian Edward Shorter in the early 1970s, 1559 computers were operating in 529 American universities, of which 95 percent were IBM computers in 1968-69.\(^{693}\) In this sense, although computers were relatively exclusive, they profoundly impacted discussions about historical methodology.\(^{694}\) As a consequence, the 1960s and 1970s saw a first wave of computerised history, which relied primarily on punched-card methods for quantitative analysis. These methods had roots in mechanical procedures of binary coding, which had existed since at least the seventeenth century, in variegated practices of popular entertainment and industrial production.\(^{695}\) They were also conditioned by historical developments in computation and public administration. For instance, the implementation of the punched-card system of Herman Hollerith, in the 1890 US Census’ classification and statistics on the gender, race and age of the US population was a significant conditioning factor for computerised historiography.\(^ {696}\) Beyond the US, various punched-card systems were gradually implemented on a broad scale in Vichy France and National Socialist Germany throughout the 1930s and 1940s for demographic statistics and the heinous ends of these political systems.\(^{697}\) Public institutions in the following decades made increased use of punch cards. This paved the way for analysis and processing of data on a hitherto unprecedented scale, following contemporary, statistical methods. For socio-economic historians, this created new sources and possibilities for transcribing old data and ways of systematising and quantitatively study them with computerised methods.

The emergence of computerised methods in historiography is emblematised in the research field Cliometrics, a denominator which combines the name of History’s muse in Greek mythology, Clio,
with metrics. The work of economic historians Robert William Fogel and Stanley Engerman stand as paramount in this regard. Their key work *Time on the Cross: The Economics of American Slavery* (Brown and Company, 1974) resulted from years of experimentation with computerised data processing to analyse the living standards of slaves in the American South. The book’s quantitative methodology stands as a landmark. However, its conclusion that slaves' living conditions were safer and characterised by greater upwards social mobility than hitherto depicted, remains highly controversial and contested because of its data bias.

Computerised methods were embraced specifically for their ability to process large-scale datasets. As historian Edward Shorter pointed out in the early 1970s, these methods' significant affordance was their ability to handle datasets larger than what had been humanly possible to process before. Shorter stated that computerised methods allowed him to analyse a “gigantic quantity of information”. By using standard IBM punch cards this would be done through the creation of a taxonomy of variables, for instance a person's political affiliation, represented by different numbers, grouped into different fields. The taxonomy would be explained in an accompanying codebook allowing other scholars to read the punch card's fields and process them with similar, primarily IBM equipment. According to Shorter, if scholars prepared their taxonomies with proper methodological care and shared standards, their results could be seen as “a fairly faithful mirror of the historical reality”.

Such methods opened new avenues for various historical traditions. In political history, they allowed to structure transcribed biographical data in such a way that historians could go beyond the meticulous study of single significant individuals to create biographies of entire elites, and discern

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698 The term’s coinage which is widely attributed to economic historian Stanley Reiter and date to 1960, see the ‘About’-page of the Cliometric Society: [http://cliometrics.org/about.htm](http://cliometrics.org/about.htm). Last accessed January 24, 2017.


701 Edward Shorter, op.cit., 6-7. As Shorter wrote in this regard: “At what point should the historian turn to the computer? As a rule of thumb, historians who have fewer than two hundred cases, and who have, for each case only a few pieces of information, will prefer to work by hand. Once, however, the number of items of data for each case increases to ten or so the historian will wish to think seriously about a computer.”

702 Ibid., 22.

703 Ibid., 28, 30 and 36.

704 Ibid., 29-30.

705 Ibid., 37.
shared features in backgrounds and social profiles. And they supported comparative analysis of demographic data in sociological history's studies of mass movements, through a wide array of variables. For movements such as strikes, it was possible to compare different historical cases using variables such as date, location and magnitude and to perform more advanced tasks by linking and classifying protest statements, to quantify and compare their sentiments and discourses.

Deeply inspired by these developments in the 1970s, Annales historians became leading in using computerised methods, arguably because their interdisciplinary approach was particularly adept for embracing approaches from sociology and economics. Ladurie's key work The Territory of the Historian (first published in French as Le territoire de l'historien, 1973) epitomises this. Its first part, “Learning to Live with Computers: The Quantitative Revolution in History”, contended that computational methods had become “taken for granted” at that point in time and pervaded Annales historiography. Like Shorter, Ladurie emphasised that the computer offered a powerful way to deal with the “bulk” of larger corpora and therefore promised a step forward especially for historical demography. He championed computational methods, contending that historians had hitherto been “prisoners of their unsophisticated methods” and would need to become “historiometrician[s]” and archivists “historical technologist[s]”, to finally recapitulate that “history which is not quantifiable cannot claim to be scientific”.

Yet, different from Shorter and the cliometricians, Ladurie and the Annales historians propagated a “serial history” (“histoire sérillée”); a type of history that had profound affinities with Braudel’s notion of longue durée. Within the otherwise interdisciplinary mindset of Annales, historian Pierre Chaunu suggested this term to demarcate Annales' disciplinary scope more clearly from economic history. He contended that economic history was biased towards national sources

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706 Ibid., 16.
707 Ibid., 19.
708 Ibid., 21.
709 Edward Shorter makes the point that computerized socio-economic historical research in France were among the most advanced (Edward Shorter, op.cit., 25) and Emmanuel Le Roy Ladurie underlines that Annales historiography had a penchant for quantitative history since its beginning with the foundational works of historians such as François Simiand and Ernest Labrousse in the early 1930s (Emmanuel Le Roy Ladurie, op.cit., 7).
710 Emmanuel Leroy Ladurie, op.cit., viii. As Ladurie writes: “...some of the studies referred to in this collection required the use, as long ago as 1966, of the computer as an instrument of historical discovery, something that is today taken for granted.”
711 Ibid., 3 and 4.
712 Ibid., 7, 61 and 15.
714 Pierre Chaunu, "Histoire quantitative ou histoire sérillée", in Cahiers Vilfredo Pareto, T. 2, No. 3 (1964) 166.
produced after modernity's rise of statistics and thus imposed a temporal, linear scope which excluded earlier, historical sources.\textsuperscript{715} In this respect, serial history aspired to establish a longer term perspective, spanning several centuries and quantifying a wider array of source materials pertaining to – along the lines of Braudel's approach – larger or local regions rather than nation-states.\textsuperscript{716} Along these lines Ladurie for instance analysed the developments of Parisian rents from the Middle Ages to the Eighteenth century, processing sources from a multitude of long-lived institutions such as universities, hospitals and factories.\textsuperscript{717} Thus, serial history regarded its computational methods as emancipating a scientific approach, but by anchoring it in Braudel's \textit{longue durée} perspective also showed acute awareness of historical interpretation's ambiguity by opposing linear accounts.\textsuperscript{718}

In spite of its foundation in Braudel’s historiography, the computer's centrality in cliometrics and \textit{Annales} historiography has been heavily criticised for its scientism and, recalling Ricoeur's discussion of macro- versus microperspectives, as failing to recognise agencies and contingencies at the micro-level. Clearly, Shorter's guide addressed such criticisms when remarking, with regard to the making of codebooks, that:

Some readers will see in this requirement a basic philosophical stumbling block to quantitative history, arguing that no two events are really comparable, because each will have different origins and consequences. Other readers, however, will share with the social sciences the assumption that common elements of behaviour unite all human actions, and press on to see how the computer may serve in the elucidation of this commonality.\textsuperscript{719}

This observation responds to the view among critics that the historical document's uniqueness is lost in computer-based methodology.\textsuperscript{720} As Michel de Certeau contended, while computerised methods were widely regarded as offering a new objective fact production because of its precision and standardised, statistical procedures, it still relied on top-down conceptual definitions to determine significant historical events and themes.\textsuperscript{721} The computer, he argued, therefore risked

\begin{itemize}
\item \textsuperscript{715} Ibid.
\item \textsuperscript{716} Ibid., 167-169, 174 and 175.
\item \textsuperscript{717} Emmanuel Le Roy Ladurie, op.cit., 61.
\item \textsuperscript{718} Georg Iggers, op.cit., 66. As Iggers writes with regard to \textit{Annales} historiography's use of quantitative methods: "In the late 1950s, François Furet and Adeline Daumard had asserted categorically that 'from a scientific point of view, the only social history is quantitative history'".
\item \textsuperscript{719} Edward Shorter, op.cit., 5.
\item \textsuperscript{721} Michel de Certeau, op.cit., 1986, 214.
\end{itemize}
becoming a new, authoritative arbiter taking on the function which princes had once had in deciding historiography's evidentiary status and objectivity. As he put it:

From this point of view, the tribute that contemporary erudition pays to the computer will be equivalent of the ‘Dedication to the Prince’ in books of the seventeenth century: a recognition of obligation with respect to the power that overdetermines the rationality of an epoch.\footnote{Ibid., 208.}

De Certeau found it necessary to repoliticise historiography by developing reflexive stances which critically interrogate the conditioning factors of the researcher's methods.\footnote{Ibid., 213.} While this critique was vehemently rejected by \textit{Annales} historians in the 1970s, de Certeau's call for reflexivity gradually became an integral part in \textit{Annales}' later methodological ramifications throughout especially the 1990s.\footnote{Eric Maigret, "Les trois héritages de Michel de Certeau. Un projet d'analyse de la modernité", in \textit{Annales. Histoire, Sciences Sociales}, Vol. 55, No. 3 (2000) 515.} Thus, \textit{Annales} historiography has tended to nurture increased methodological pluralism, rather than rigorous empiricism. While \textit{Annales} historiography has had and maintains a strong component of scientism rooted in quantitative methods, it has equally fostered an epistemological ambiguity by taking a reflexive stance with regard to its methods. As Iggers has remarked, \textit{Annales} historians: “[on] the one hand (...) share the confidence of other social science-oriented historians in the possibility of scientific approaches to history; on the other hand, they are aware of the limits of such approaches”.\footnote{Georg Iggers, op.cit., 51.}

New Cinema History shares this attitude in the evolvement of its analytical practices, by adopting quantitative history's empirical approach to databases and its simultaneously affirmative and ambiguous attitude towards history as a scientific undertaking.\footnote{Richard Maltby, op.cit., 2011, 29.} This is particularly visible in how film historians qualify its epistemology. For example, Ian Christie argues that the problem-oriented focus and methodological rigour of Allen and Gomery's socio-economic history inaugurated a welcome new empiricism.\footnote{Ian Christie, op.cit., 2006, 70.} Conversely, film scholar Michèle Lagny, whose work has stood at the forefront of combining film history and \textit{Annales}' methods, contends that Allen and Gomery's work created a disciplinary stratification which, inadvertently of their stated goal, nourished a pluralist methodological perspective which highlights the ambiguity of historical
New Cinema History also reflects *Annales*’ serial approach to socio-economic, cultural history when stressing a need to build databases of and quantitatively analyse film-related material such as bills, membership registers, trade papers and magazines from a great variety of different institutional archives. It is along these lines that new cinema historians engage with quantitative methods and their developments to analyse film-related sources.

To elucidate how this evolvement reflects in New Cinema History, I will now discuss in greater detail how media historians have picked up computational techniques from *Annales* historiography and the social sciences to produce evidence from the quantitative analysis of databases. As I will sketch in the following examples, new cinema historians who engage with these methods also follow and integrate their technical developments which have occurred in different waves. For instance, the emergence of personal computing throughout the 1980s and 1990s marked a transition from a first wave of punch-card based methods to database organisation which has been labelled as a second wave of historical computing. In more recent years, the emergence of new instruments for big data analysis has introduced what is considered a third wave of historical computing. The two New Cinema History projects which I discuss below, respectively *Cinema Context* and *Lantern*, illustrate the legacy of *Annales* and the waves of quantitative historiography particularly well.

In 2006, film historian Karel Dibbets launched *Cinema Context*, a public, online database for the analysis of film distribution and exhibition networks in the Netherlands. The creation of *Cinema Context's* empirical fundament dates back to the late 1970s. In this period, Dibbets’ primary research focus was the development of film distribution networks in the Netherlands in the silent period. Not unlike serial history’s studies of the interaction between individuals belonging to elites, his research regarded each cinema and its steering board as a node within a distribution network, to understand their relations by studying ‘interlocking directorates’, focusing on how

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728 Michèle Lagny, op.cit., 1994, 41.
729 Deb Verhoeven, "New cinema history and the computational turn", (paper presented at the World Congress of Communication and the Arts in Guimarães, Portugal, 2012). Paper available online at [http://dro.deakin.edu.au/eserv/DU:30044939/verhoeven-newcinema-2012.pdf](http://dro.deakin.edu.au/eserv/DU:30044939/verhoeven-newcinema-2012.pdf), last accessed January 24, 2017. As Deb Verhoeven writes concerning this expansion of sources: “By expanding the range and type of information that is relevant to our study (government reports, ordinances, building or police records, regulatory legislation, tax files, oral histories, marketing materials, industry archives, maps, box-office data, phone books, ticket stubs, newspaper advertisements just to name a small few) we correspondingly expand the amount of information available to us and lift the significance of our ability to locate, collect, aggregate, curate, manipulate and analyse different data formats from different sources and for which available tools are proving increasingly inadequate.” On a related note one might argue that Verhoeven echoes Ladurie's argument that public institutional archives - as a consequence of computerisation - gained a new, more fundamental relevance for historians.
731 Ibid., 334.
cinema board members were part of different corporations simultaneously. As the basis for his network analysis, Dibbets created a dataset using the name and address lists from the Nederlandse Bioscoopbond (NBB) – the Dutch Federation of Cinemas - from in particular the late 1920s. More recently, the dataset has been enriched with data from the files of the Dutch Board of Film Censors from between 1928 and 1960, and for the early teens, news ads from both national and local Dutch newspapers.

Developing his methodology since the late 1970s, Dibbets’ research is located at the cusp of punch-card based serial history and a later wave of personal computer-based, socio-economic history. Dibbets has recounted, how, when making the dataset in the late 1970s, he initially created and processed punch cards from his source material. This was done using the University of Amsterdam and the Vrije Universiteit Amsterdam's computer facilities at the joint computer center, Stichting Academisch Rekencentrum Amsterdam (SARA). In recent years, Cinema Context has used Microsoft Access to organise datasets about films, cinemas, people and companies allowing users to contribute data from a wider array of sources. This latter development may be characterised as methods emerging during the 1980s and 1990s pertaining to, using historians Evan Mawdsley and Thomas Munck’s characterisation, a “second age of ‘historical computing’”. These approaches rely on widely available personal microcomputers and less on programming skills. They also tend to be produced by research teams of historians and assistants who transcribe keywords.

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732 Ibid.
734 Karel Dibbets via e-mail July 2, 2014 to Professor Julia Noordegraaf with the author added in cc. See also "Colophon", on the Cinema Context website: http://cinemacontext.nl/cgi/b/bib-idx?c=cccfilm;sid=468f76e8a1e2225557b52e839ee85ed.tpl=colophon.tpl;lang=da, last accessed January 24, 2017. Among others the Algemeen Handelsblad (today NRC Handelsblad) and Nieuws van den Dag.
735 Karel Dibbets, op.cit, 2012 [1980], II. As Dibbets has stated: “Tegenwoordig is zo’n netwerkanalyse makkelijker uit te voeren dan in 1979, toen de thuiscomputer nog niet bestond. De universiteit bezat één zogenaamde supercomputer. De data en de programmatuur moest je op ponskaarten inleveren bij de balie van het Rekencentrum, waar ze ’s nachts verwerkt werden. De volgende dag mocht je de resultaten komen ophalen, afgedrukt op een dik pak papier, want beeldschermen waren er nog niet.” Translation: “Today such a network analysis is easier to perform than in 1979 when the home computer did not yet exist. The university owned a so-called supercomputer. You had to hand in the data and software on punch cards by the counter of the computing center where they would be processed during the night. The following day you could come to pick up the results, printed on a thick bundle of papers as there were no screens yet.”
736 Piet Kuijper, Baanbrekend calculeren: 30 jaar Reken- en Netwerksdiensten SARA. (Amsterdam: SARA Reken- en Netwerksdiensten, 2001) 75. In 1971, these universities jointly opened their first computer center, Stichting Academisch Rekencentrum Amsterdam (SARA), to support academic researchers in, among other things, quantitative, historical analysis. Thus, as in the US, UK and France, the Netherlands equally began integrating computational methods of administration into its research practices in this period.
737 “About”, see: http://cinemacontext.nl/cgi/b/bib-idx?c=cccfilm;sid=550f42d8bf50a542381a68245f1ac256.tpl=about.tpl;lang=da, Last accessed January 24, 2017.
738 Evan Mawdsley and Thomas Munck, op.cit., 3.
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from paper sources and microfilm to create databases. While they reflect the organisational modes of punched-card-based methods they also contrast them by being more flexible and allowing for producing a greater variety of visualisation types.

Dibbets' research can be said to reflect the epistemological underpinnings of serial history particularly in two fundamental aspects. First of all in the way in which it combines data from different collections to establish a research-based, macro-perspective on cultural history. One of Cinema Context's stated ambitions is to encourage film historians to actively develop computer-based tools of analysis to avoid ending up with institutional display formats that do not serve their own methodological ends. Dibbets considers it a fundamental task for the historian to mediate between otherwise unconnected collections by combining sources from them in scholarly research formats. In doing so, as in serial history, it conforms variegated sources and data types from different collections to a unifying coding system that facilitates network analysis on the historian's own terms. Second, using a scientific terminology, Dibbets stresses how “digital instruments” may be seen as changing the humanities as “the microscope and the telescope changed the sciences”. Extending this scientific metaphor to characterise Cinema Context's potential, Dibbets stresses that “[t]hrough collecting enough information, users see that the genes start to connect and grow together to form sequences, patterns and networks, unravelling the DNA of film culture.” In this regard, Dibbets' research can be said to reflect Annales historiography's serial and multi-scopic viewpoint, by calling for a use of digital methods which simultaneously allows for visualising both the broad historical patterns and tiny structures of film distribution.

As a second project which equally reflects a serial approach but also embodies more recent developments in data mining, the search tool Lantern is a particularly illustrative example. Developed by media scholar Eric Hoyt and his team for the analysis of primarily North American technical and fan journals digitised for the online Media History Digital Library, Lantern stands as an illustrative example of what has also been dubbed a third wave of computer-based historical methodology. Roughly, third wave methods such as data mining and knowledge discovery in

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739 Ibid., 8.
740 Ibid., 3-4.
741 Karel Dibbets, op.cit., 2010, 332.
742 Ibid., 332.
743 Ibid., 331.
744 Ibid., 336.
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databases (KDD), emerged during the mid-1990s and early 2000s. As in the first wave of punch card based methods, some of their key affordances is perceived to be their ability to process larger data amounts and as allowing for greater automatisation of the analysis of historical sources to establish macroscopic *longue durée* perspectives. Where historians manually extracted, coded and transferred keywords, names or places from documents to punch cards, digitisation allows for automated text analysis using either exploratory approaches, or machine learning and topic modelling. For many document formats that are closed for editing, PDF as the most widespread, it is possible to use optimal character recognition (OCR) to extract text and intervene analytically in entire documents rather than only a manual selection of key words. Therefore, OCR is associated with a greater notion of comprehensiveness, in which bulks of digitised sources, or “the great unread”, of digitised archives may be explored and analysed. Evidently, results achieved with OCR, depend on the ability to recognise a given typography on scan quality and also involves coding in the process of defining and/or selecting key words. Yet, OCR does produce larger textual corpora for computational analysis than hitherto possible and allows for visualising and linking results in a more inductive manner because it can work with unstructured data to a greater degree.

In comparison to punched-card methods’ reliance on codebooks of manually defined top-down categories, topic modelling can therefore nurture exploratory word analysis by automatically coding and counting a select number of topics in large datasets.

Hoyt’s Lantern project deployed these methods by digitising and OCR’ing 900,000 pages from public domain trade journals and making them accessible in the online Media Digital History Library. The Lantern search tool which was later added allows for data mining and visualisation in combination with simpler, standard search queries to supplement traditional archival research.

The Lantern tool furthers research on silent era periodicals in two fundamental aspects. In line with a distant reading approach, it first explores the great unread beyond “the canon of tradepapers

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746 Usama Fayyad, Gregory Piatetsky-Shapiro, and Padhraic Smyth, "From Data Mining to Knowledge Discovery in Databases", in *AI Magazine*, Vol. 17, No. 3 (1996) 37.
748 Eric Hoyt, op.cit., 158. The notion of "the great unread" of non-canonical texts was suggested by literary scholar Margaret Cohen and has become widely known through Franco Moretti’s distant reading approach.
749 Ibid.
750 Ibid., 148. As Hoyt explains the OCR is ‘dirty’ meaning that they were not checked by a human researchers afterwards.
751 Ibid., 146. As Hoyt explains the OCR is 'dirty' meaning that they were not checked by a human researchers afterwards.
752 Ibid., 148. See also Eric Hoyt, Kit Hughes, Derek Long and Anthony Tran, "Scaled Entity Search: A Method for Media Historiography and
and fan magazines". As Hoyt points out, previous scholarship and access projects on analogue formats, microfilm especially, have established a reference frame, in which periodicals such as *Variety* and *Photoplay* have become canonical source material for research on film reception and spectatorship, at the neglect of a wide range of magazines which had been published in large numbers. For example, as Hoyt points out, the magazine *Film Fun*, which was published in relatively large numbers, was never cited in any article available in the academic journal database JSTOR. Second, Lantern recasts the study of silent era publications by allowing for analysis with data mining, and word cloud visualisations created through topic modelling. In the latter, a select number of topics have been listed and prioritised in order to visualise how frequently they appear and in which periods they trend so as to understand when, where and how they became prominent within the film industry or among fans. In this way, Lantern's data mining tools make it possible to analyse linguistic patterns within the journals in the Media History Digital Library and identify the groups related to them, discerning in this way in particular the networks of popular cultures rather than elites.

To conclude, contemporary new cinema history closely aligns with serial history as it has developed from punch cards to data mining. Currently, projects mainly rely on “second age” database organisation, while data mining methods are gaining prominence as increasing amounts of film-related sources become digitised. As I discuss in the next section, these later methods' also imply a significant shift in representational practice. Where punch card technologies created tabular representations through basic programming, “second age” methods prompted the historian to structure and negotiate graphic representations of data through a greater variety of statistical formats. Recently, in particular cartographical, GIS-based formats have become prominent in New Cinema History research, reflecting an ambition to further develop total history's macro-perspective. In the following section I shall turn to this development, discussing in particular three key aspects of it, respectively the uses of different map types and their origins in different

Response to Critiques of Big Humanities Data Research", in Proceedings of IEEE Big Humanities Data, available online at: https://bighumanities.files.wordpress.com/2014/10/hoyt.pdf, last accessed January 24, 2017.

Ibid., 159 and 152.

Ibid., 152.

Ibid., 150.

Ibid., 148. For Hoyt, data mining is defined as simple search queries.

Ibid., 164.

Evan Mawdsley and Thomas Munck, op.cit., 9-10. From a present-day perspective, it is interesting to note that Mawdsley and Munck write: "At the moment mapping software is relatively demanding in a technical sense, but its potential future value for historians is great".
disciplines, the representation of historical time in GIS and the development of strategies for showing reflexivity and ambiguity in GIS-based data analysis.

4.2. Negotiating the Map as Evidence in New Cinema History

In recent years, new cinema historians have increasingly organised themselves to share and develop methods of analysis and visualisation collectively. As cinemetricians gather around Cinemetrics, new cinema historians equally organise themselves in an online, international network with a shared reference frame: The History of Moviegoing, Exhibition and Reception (HoMER). Founded by scholars in mainly the UK, Australia, Netherlands, Belgium and the US, it has been active since 2004. Compared to Cinemetrics, HoMER is arguably a more formal, scholarly network, as it does not include amateur contributions. Its website, launched in 2013, invites scholars to register projects or datasets that fall into either moviegoing, exhibition and/or reception studies. Registered projects, which for the most part appear to contain databases consisting of manually transcribed data, are subsequently plotted onto an OpenStreetMap interface to visualise their location and facilitate inter-institutional collaboration and knowledge and data sharing. HoMER members also exchange expertise at workshops, at media studies, history and digital humanities conferences, for instance the Network for European Cinema and Media Studies’ (NECS) annual conferences. The set-up of the site, the mapping of scholarly projects, testifies to an increasingly prominent tendency to deploy GIS as a form of visual analytics in New Cinema History in recent years.

One of the reasons why historians take interest in maps as representational practice is because their information density and non-linear display format allow for exploring spatial relations between historical events and located phenomena in greater detail than prose. More locations can be shown than with the written word and their relations need not necessarily be ordered in a linear flow which hierarchise their relations. In Annales historiography, cartography has traditionally occupied

759 See: http://homernetwork.org/. Last accessed January 24, 2017. The scholars present at the founding conference were Daniel Biltereyst (Ghent University), Kate Bowles (Wollongong University), Karel Dibbets, (University of Amsterdam), Kathy Fuller-Seeley (Georgia State University), Douglas Gomery (University of Maryland), Amy Howard (University of Richmond), Nancy Huggett (Wollongong University), Jeffrey Klenotic (University of New Hampshire), Arthur Knight (College of William & Mary), Richard Maltby (Flinders University), Phillipe Meers (University of Antwerp), Robert K. Nelson (College of William & Mary), Clara Pafort-Overduin (Utrecht University), John Sedgwick (London Metropolitan University), Robert Silberman (University of Minnesota).

760 See: http://homernetwork.org/submit-project/, last accessed January 24, 2017. The website contains both a ‘Submit project’ and a ‘Register dataset’-section.


762 David J. Staley, op.cit., 55.
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a prominent place, due to its emphasis on geography. Speaking of "geo-history" in *The Mediterranean*, Braudel for instance sought to understand interrelations between environmental factors, human activity and the unfolding of historical events through extensive use of choropleth maps showing flows of transhumance or trade in combination with statistical tables. Furthermore, within the department headed by Ladurie - the Ecole Pratique des Hautes Etudes’ 'Sixth Section' - *Annales* historians produced maps at the renowned cartographic laboratory directed by semiotician Jacques Bertin. Bertin’s groundbreaking work in information visualisation, synthesised in *Semiology of Graphics: Diagrams, Networks, Maps* (first published in French as Sémiologie graphique. Les diagrammes – Les réseaux – Les cartes in 1967), paved the way for widely used - according to Drucker almost "exhaustive" - principles of graphic design for conceiving maps, which remain visible today in contemporary interface design.

Recent years’ proliferation of GIS visualisation and abundance of geodata sees a recasting and renewed interest in the relationship between (human) geography and history in the vein of *Annales* in widely varying areas of socio-economic, historical inquiry. In book history, GIS has been used to show the location of publishers, libraries and printers to study historical developments in distribution and trade. For new cinema historians, GIS is used to visualise the spatial series of film distribution, exhibition and production networks. This methodological development has seen new cinema historians engage with the contemporary discussions and epistemological concerns in socio-economic history and human geography, especially with regard to the deployment of tools originating in the sciences. To elucidate these discussions, I attend, in the following, to how the concerns and methodological practices of historians and geographers intersect with those of new cinema historians, by focusing on three key areas in GIS visualisation, namely map types and their disciplinary origins, the representation of historical time and strategies of reflexivity. To anchor my discussion, each of these key areas will be discussed in relation to examples from recent New Cinema History projects.

**GIS in New Cinema History: Epistemologies, Map Types and Representations of Historical Time**

GIS has, especially since the 1990s, been increasingly tailored to hermeneutical methods of

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763 Peter Burke, op.cit., 36.
764 Johanna Drucker, op.cit., 44.
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historical inquiry, which in contrast to serial history's numerical rigour and coding does not claim a scientist, comprehensive vision of map-based history. Yet, at its technical core, GIS shares many similarities with serial history's information organisation. To use historian Ian N. Gregory's simple definition, a GIS visualisation is essentially a "spatially referenced database". Combining two sets of data, attribute and spatial data, specific attributes are given a geographical reference which allow for plotting them on a map with a select range of visual features. For instance, visualising census data on a map allows for studying specific population groups' life conditions and their geographical proximity to specific phenomena. Attribute data consist of for instance lists of names in combinaton with personal information, ordered in common database formats such as Microsoft Excel, Access or Dbase. Using this organisational form, as Gregory explains "...means that two or more tables can be joined together based on a common field known as a key". Keys, as in serial history's codebooks, allow for matches and comparisons to be made between population groups or persons through statistical operations. Spatial data which are kept as a separate set gives attribute data geographical references in the form of locations or coordinates on a map.

Contemporary GIS visualisation offers various ways of giving visual shape to spatial data, which are rooted in and branch out from cartography's long history, variegated traditions and graphical conventions, but characterised by its own distinguishing techniques. For instance, while it was, before GIS, customary to study single maps or comparing maps next to each other, GIS works extensively with map overlays. Through map overlays, different graphical or photographical depictions of landscape features or geographically located phenomena are layered onto another to highlight their occurrence and changing networks in time and space.

There are two primary GIS map types, namely vector system maps and raster data models. Vector maps represent spatial data by demarcating geographical areas on a map through the

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768 Ian N. Gregory, *op.cit.*, 2-4.
769 Ibid., 8.
770 Ibid., 9.
771 Ibid.
772 Ibid.
combination of lines and polygons, or locations indicated by points.\textsuperscript{775} Conversely, raster maps represent geographical areas with pixels to create a more continuous representation of geographical areas.\textsuperscript{776} They differ from vector maps, by depicting variation in features, such as for instance altitude, in greater detail.\textsuperscript{777} Though often combined, the types tend to serve different ends, seeing vector maps being used to analyse especially human activities with complex attribute data, such as census data, whereas raster maps are more widely applied in the earth sciences.\textsuperscript{778}

There is a plethora of both proprietary and open-source GIS software available which scholars use to make sense of their data. In contemporary GIS, the proprietary software ArcGIS developed by Environmental Systems Research Institute (ESRI) launched in 1999, is one of the most frequently used for geo-analysis of census data in human geography and historical research as well as an industry standard in urban planning and environmental science.\textsuperscript{779} A development of the software ArcInfo, which was released in different versions throughout the 1980s, it was created by Environmental Systems Research Institute (ESRI) of landscape architects Jack and Laura Dangermond in 1969.\textsuperscript{780} ArcGIS stands out because it is map-based instead of being document-centered. This means that rather than visualising a database of georeferenced documents in for instance Google Maps, it offers a wide variety of map types and enables users to import and create their own visualisations from historical maps and aerial photos and plot data onto them.

While GIS is becoming increasingly embraced by historians, it holds specific implications for the use of maps as historical sources, recasting the relationship between the scholar and the map. In historical research which relies on maps as historical sources, scholars traditionally tended to regard maps as primary source material because it is an original document.\textsuperscript{781} In GIS methodology, historical sources tend not to be granted this status because it recasts the relation between the map and the historian through an additional layer of mediation, which makes it a less reliable source of information. In particular, in order to be used in GIS research, the map has to undergo a complex,
contingent and time-consuming processes of data capture, involving, for instance, scanning or manual data transfer.\textsuperscript{782} Moreover, the surface, borders and demarcation of a geographical area on a historical map may differ significantly from contemporary ones or its dimensions may have become distorted due to shrinkage of the original source's material basis throughout its archival life.\textsuperscript{783} Such features can be adjusted to fit contemporary standards, a process referred to as "rubber sheeting", but evidently – as with digital restorations of film transfers – such a procedure raises several epistemological issues as to its consequences for the digitised map's historicity.\textsuperscript{784} Alternately, historians can extract and plot geo-references from traditional paper sources instead of maps by OCRing digitised historical documents.\textsuperscript{785} In this case, the geo-references are created from documents such as bills, censuses, letters, or articles without a map as its referent. For these reasons, GIS methodology considers historical maps secondary sources after maps using digital-born geodata obtained with GPS or satelite.

Following the practices of historical GIS, new cinema historians make use of a wide variety of proprietary and open-source software to study both digitised maps and contemporary interfaces.\textsuperscript{786} \textit{Cinema Context} has for example added Google Maps as a recent feature to the project, to enable users to visualise exhibition patterns in the Netherlands by mapping cinemas, distribution companies or programs onto its basic map interface using the project’s Access database. As a commonly used option which relies entirely on Google Map’s visual organisations, this constitutes a predominantly presentist interaction with the transcribed data's spatial relations, because the proximities and networks which it allows the user to discern are constantly adjusted following Google’s updates. Other new cinema history projects have made more elaborate attempts at developing map-based interfaces using digitised historical maps, which combine and appropriate the visual organisation of historical maps through the navigational regime of contemporary GIS software. The project \textit{Early Cinema in Scotland 1896-1927}, developed in partnership between the Universities of Edinburgh and Glasgow, instantiates a more advanced GIS representation in its use

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\textsuperscript{782} Ibid., 19 and 21.
\textsuperscript{783} Ibid.
\textsuperscript{785} Ian N. Gregory, op.cit., 22.
\textsuperscript{786} There exists a plethora of GIS software and the discussion of them in this section cannot aspire to be comprehensive nor pay equal respect to each type of them. In this regard I have delimited my discussion to the most widely used types of GIS software among new cinema historians focusing especially on their fundamental features and functionalities. It is however worth pointing out that while ArcGIS remains the standard, historians increasingly adopt software such as for instance QGIS because it is open-source.
\end{flushright}
of a digitised historical map as its base-map. The project worked with and explored the relations in data of approximately 500 films and 600 Scottish cinema venues of the period, based primarily on descriptions retrieved from trade papers. These were plotted onto a period map of Great Britain, from between 1897-1907, retrieved from the Bartholomew archive of historical maps, digitised by the National Library of Scotland.

Figs. 32 and 33 Screen grabs from the project interface of Early Cinema in Scotland 1896-1927 which combines a digitised map from the National Library of Scotland's Bartholomew collection with OpenStreetMap through an overlay operation. At the meso-level the user remains in the historical map’s regime of vision while the contemporary layer of transportation and trade becomes visible at the street’s micro-level.

Digitised in a high-resolution format, the historical map has been fitted and overlaid to a GIS map of Great Britain produced within the open-source collaborative project OpenStreetMap. Zooming in on the digitised map allows the user to switch between respectively the interface of the historical map and that of the contemporary OpenStreetMap (see figs. 32 and 33). The resulting tool allows for visualising and comparing film distribution patterns on different levels by switching from the national overview to the local micro-level of the street and the single screening. Furthermore, it

788 See: http://earlycinema.gla.ac.uk/films-list/ and http://earlycinema.gla.ac.uk/venues-list/, last accessed January 24, 2017. The information on data bases, as the website explains was gathered from “...the Scottish Cinemas Database, Cinema Treasures, Canmore, trade press directories, historical maps, and many other sources”.
789 “The Bartholomew Archive. Background”, see: http://digital.nls.uk/bartholomew/background/index.html, last accessed January 24, 2017. This archive is made up of maps, engravings and sketches of the company John Bartholomew & Co. (later John Bartholomew & Son), founded in 1826 by cartographer and geographer John Bartholomew and continued, partly as a family company, until its closure in 1995. The company was one of the most advanced and prestigious companies of cartography and played a significant part in the formation of the Royal Scottish Geographic Society and the National Institute of Geography in Edinburgh. From this collection, the project has made use of a Bartholomew Halfinch Map - meaning that half an inch corresponds to one mile - dating from the period 1897-1907.
enables the exploration of film titles on both a textual and a contextual level through two clickable options in the upper left corner: "Film Locations" and "Cinema Venues". By clicking "Film Locations", the user can visualise films based on their depictions of specific locations. In this way the user may seek out films pertaining to a particular region, discern patterns in the choice of shooting locations and genre. Conversely, clicking "Cinema Venues" allows to visualise more traditional contextual features such as location of theatres and/or screening venues on the map. In this way, the map is used as a structuring template and source for analysing spatial patterns in Scotland’s film exhibition and production history simultaneously.

In Robert C. Allen’s project Going to the Show one can equally discern an interesting use of historical maps both for data capture and overlays. The project researches the socio-economic history of movie-going in North Carolina's smaller cities in the early to late silent years, with an emphasis on the relation between race and cinema experience. In this period, a third of North Carolina's population was African American and also had one of the most significant populations of American Indians in the East of US. The project set out to show that cinema’s emergence was to a much greater degree than hitherto considered, a phenomenon which marked the urban life in small emerging cities, rather than primarily in large urban centres. Second, that race was a significant conditioning factor for movie-going in their urban environments. To this end the project captured data from and integrated 750 Sanborn maps - maps created by the Sanborn company from the late nineteenth century onwards mainly for fire insurance purposes across the US. Integrating this data into its interface, allows to click movie theatres and see, when the information exists, what the racial policy of individual theatres were in combination with their location. It also provides access to newspaper clippings and relates this, in a state map view of North Carolina, to the percentage and number of minorities in specific regions.

In the project's map view of North Carolina, the digitised historical georeferences are projected onto a Google Earth interface. In this aspect Going to the Show arguably aligns predominantly with contemporary GIS visualisation, rather than giving prevalence to a historical map's visual organisation as in Early Cinema in Scotland. Using Google Earth's view of North Carolina as its

794 Robert C. Allen, op.cit., 2010, 269.
795 Ibid., 270.
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base-map to which a vector layer has been added with a legend appearing on its left-hand side it remains – at least on the macro-level - primarily within a contemporary GIS-based conception of digital cartography and the visual conventions of human and cultural geography. As described by Gregory, this can be seen as a reflection of how the presentist view and visual regime of contemporary GPS takes precedence over the historical map as a primary source (see fig. 34). Yet, Going to the Show also works with map overlays in a similar fashion as Early Cinema in Scotland. In the GIS visualisations of the individual cities, one may choose between and zoom in on Sanborn maps from a variety of years to see how they overlay with the contemporary cityscape. Consequently, one may argue that the interface's organisation and integration of temporally distinct views creates a 'multi-scopic' play between a macro- and a micro-level where the total account of the patterns displayed at state level can be tested against the historical sources geographical information at the micro-level.

![Fig. 34 Going to the Show’s GIS visualisation of movie theatres in North Carolina using data extracted from Sanborn maps to create a vector map layered onto a Google Earth map view.](image)

Representative of the visual conventions of new cinema historians' map uses in GIS, these projects align closely with especially human and cultural geography's standards, using primarily vector maps, while avoiding techniques more widely applied in the earth sciences, such as three-dimensional landscapes or satellite images for depicting meteorological phenomena.
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While scholars laud GIS’ ability to represent the spatiality of historical events with maps, its temporal component is on the contrary often considered highly limited. At the core of this problem lies the circumstance that topology is not, so to say, spatio-temporal but usually represents a geographical surface statically.\textsuperscript{797} However, the depiction of time is particularly crucial for historians. Consequently, as noted by Gregory and Ell, historians have been among the earliest to develop methods for depicting temporality in GIS, which has resulted in hugely varying approaches to representing time.\textsuperscript{798} Possibly the simplest way is to display temporal data as attribute data in an overlay operation, where the information appears in a box when clicking on a spatial feature.\textsuperscript{799} Thus, to take an example of applications in book history, if clicking for instance a company or a book publisher located on a map, one can access a list of its annual revenues or production numbers in a separate box.

\textbf{Fig. 35} At the city level \textit{Going to the Show} allows the user to explore different overlays of Sanborn maps in different cities in North Carolina through a \textit{key dates} approach.

Another widely used approach, is the \textit{key dates} approach in which a set of central dates, years or events in which specific data attributes changed in crucial ways are defined or were registered, for

\textsuperscript{797} Ian N. Gregory, op.cit., 36.
\textsuperscript{798} Ian N. Gregory and Paul S. Ell, op.cit., 129.
\textsuperscript{799} Ibid., 30.
instance census counts or maps.\textsuperscript{800} Each of the specific moments defined is subsequently represented by a separate map layer, and can be seen separately or combined.\textsuperscript{801} While this approach displays time by linking each map layer to a separate key date, it presents historians with a potentially problematic solution because of changing borders between dates which may complicate smooth overlays. Moreover, one may also argue that it reinstates a history centered around key years, dates and events, and in this way undermines a key theoretical tenet of a longue durée approach.\textsuperscript{802}

New Cinema History projects primarily work with key dates approaches in their use of GIS to display the temporal dimension of film distribution, exhibition and consumption. In \textit{Early Cinema in Scotland} specifically through the choice of the Bartholomew map overlay which situates the interface in the years of 1897-1907. \textit{Going to the Show} takes the same approach but goes a step further by allowing to choose between a greater variety of overlays. First, in the state map interface where it is possible to change the map according to “population data year” collected around the years 1890, 1900, 1910, 1920 and 1930. Doing so enables the user to see how the population density and its minority percentage changed throughout the silent period. Second, the user can go on to explore the mapped cities individually in relation to a varying number of Sanborn maps which may be chosen as a separate overlay (see fig. 35). This allows to see relations between for instance the population density of each of the regions and the emergence of local cinemas, centered around specific key years.

The GIS research conducted by Deb Verhoeven, Kate Bowles and Colin Arrowsmith places even greater emphasis on developing complex combined spatio-temporal historical representations of cinema-going.\textsuperscript{803} In their study of the cinema-going and consumption patterns of Melbourne’s Greek diaspora communities they encountered the need to represent how multiple temporalities characterise different groups' movements within them.\textsuperscript{804} To do this, they used a simple vector map taking a key dates approach centered around the years of census data counts between the late 1940s

\begin{thebibliography}{9}
  \bibitem{800} Ibid.
  \bibitem{801} Ibid.
  \bibitem{802} Yet, there exists software which specializes in depicting time in GIS such as for instance GeoTime currently used for forensic purposes, law enforcement and surveillance, which has also been added as a plugin to ArcGIS. See: \url{http://geotime.com/products/geotime/arcgis/}, last accessed January 24, 2017.
  \bibitem{804} Ibid., 76.
\end{thebibliography}
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and early 1980s.\textsuperscript{805} This makes it possible to animate the map to see how the proximity of Greek communities to Greek-language cinemas changed over time.\textsuperscript{806} An interesting conclusion drawn from this animation was that Greek-languaged cinemas tended to move into neighbourhoods before a community arrived, and close before a community dissolved.\textsuperscript{807} This illustrated the significance of temporality in historical GIS as one could otherwise have been likely to understand the temporal dynamics of such developments in the reverse order, namely that diaspora cinemas open after a diaspora community arrives.\textsuperscript{808}

Beyond the discussion of temporal representation, historians have also been deeply invested in developing reflexive, hermeneutical approaches to the underlying data interpretation in GIS methodology. In this regard, scholars are acutely aware of the extent to which maps remain, to lend Drucker’s words, “enunciative apparatus[es]” whose techniques are shaped by and potentially reflect scientist values.\textsuperscript{809} For instance, when increasingly applied in human geography throughout the 1990s, scholars criticised GIS for reducing cartography to a merely positivist, descriptive endeavour, incapable of reflecting geographical data's fuzziness and contingencies.\textsuperscript{810} In this aspect, geographers developed greater, methodological reflexivity and awareness of the role that researchers' own biases play in pre-constituting objects of study. Along similar lines, socio-economist historians have in recent years critiqued scientific GIS’ emphasis on accuracy and precision to suggest ways of foregrounding contingency and subjective interpretation.\textsuperscript{811} GIS historian David J. Bodenhamer has articulated this in the following way:

The central issue was, at heart, epistemological: GIS privileges a certain way of knowing the world, one that values authority, definition, and certainty over complexity, ambiguity, multiplicity, and contingency, the very things that engaged humanists.\textsuperscript{812}

This emphasis among humanists has spawned numerous propositions that engage with critical and cultural theory in GIS to challenge their own representations, ranging from the situationists'
notions of psychogeography - as suggested by Bodenhamer - to ethnographic, qualitative data analysis such as Grounded Theory. Especially Grounded Theory has become a widespread theoretical fundament for methodologically sound, humanistic approaches in both scholarly projects and proprietary software.

Grounded Theory was first developed by sociologists Barney Glaser and Anselm Strauss in their key work *Discovery of Grounded Theory: Strategies for Qualitative Research* (Aldine, 1967) as an alternative to positivist data collection and analysis. Seeing the latter as overconcerned with achieving “accurate facts” and testing “theory generated by logical deduction from *a priori* assumptions” it suggested an exploratory and primarily inductive approach to data analysis. Working without preconceived theoretical frameworks, Grounded Theory seeks to develop theory from its sources through an iterative process of exploratory analysis, data collection and coding. Grounded Theory researchers first collect data and explore them through thematic labelling as a stepping stone towards additional data collection and analysis. When processing for instance interviews, social science researchers first code parts of their material to see how overlapping themes or behavioural patterns are articulated by interview subjects. Subsequently, researchers continue this process by gathering and analysing more data to see if similar patterns emerge and can form the basis for a theory. In principle, the process is open-ended and its practitioners accept that data may be exhausted at different points for different researchers. Yet, within Grounded Theory, there are different views on how exactly the results yielded reflect the data. As sociologists Robert Thornberg and Kathy Charmaz have pointed out, several Grounded Theory practitioners see Glaser’s and Strauss’ initial version of Grounded Theory as inadvertently realist, because it implicitly suggests that its method creates a more direct approximation to the data’s inherent patterns by applying less formalised approaches than deductive frameworks. Consequently, to highlight uncertainty and complexity to a yet greater degree, many Grounded Theory scholars have

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813 Ibid., 11. Inspired by the 1950s Situationist International movement, Bodenhamer for instance suggests the concept of “deep maps” to highlight contradictory interpretations, contingency and subjective emotive responses to the experience of space. Concretely, he suggests this can be achieved through increased user participation in open-ended GIS visualizations, where memories can be added or used to create and include different, psychological layers of a map.


816 Ibid., 156.

817 Ibid., 157.

818 Ibid., 159.

819 Ibid., 154.
developed the approach further by drawing inspiration from postmodern theories or by encouraging researchers to interpret data differently.

Grounded Theory has been highly influential in conceiving GIS visualisations which challenge representational finitude. For instance, geographers LaDona Knigge and Meghan Cope's GIS-based “grounded visualization”, draws equally on Grounded Theory and Exploratory Data Analysis – the latter for which they propose the denominator Exploratory Spatial Data Analysis (ESDA) - to suggest a format in which users can access the data used for creating maps to reveal data bias and suggest alternative interpretations. Their format strives to let users “ponder emerging consistencies or disjunctures, make new or revised connections, and entertain rival explanations” in relation to additional sources and theoretical perspectives. In addition, the widely used proprietary software Atlas.ti developed by information specialist Thomas Muhr has drawn on Grounded Theory since the 1990s. Used for indexing and visualising patterns and networks in a wide range of document types defined as one “hermeneutical unit” - from text to multimedia files - it draws conceptually on Grounded Theory’s process of coding through its “VISE-principle”. Combining the interrelated concepts of Visualization, Integration, Serendipity and Exploration, the latter two concepts illustrate Atlas.ti’s congruency with Grounded Theory’s exploratory data research, by encouraging scholars to oppose systematised, “bureaucratic” research procedures and browse their data in an iterative, theory-building process which allows for serendipitous discoveries to be made. For its GIS visualisation, which remains a recent development of Atlas.ti, the software integrates Google Maps into its functionalities as a cartographic template from which to map the spatial connections made through its coded source material.

The use of Google Maps and Earth as interfaces is, however, a contested solution among GIS scholars who take a reflexive approach, and is used with caution in light of critiques of them. As media scholar Siva Vaidhyanathan has argued, their pervasiveness reflect “Googlization”, a process through which Google's services are used to view and experience the world, without remaining

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821 Ibid., 2028.
824 Ibid., 10.
critical of the power relations embedded in their representations and which potentially exclude users without sufficient levels of literacy or ability to operate or appropriate them. Moreover, as GIS scholars Todd Presner, David Shepard and Koh Kawano have emphasised, the use of Google Maps as a "basemap" remains in itself ideologically laden as it is shaped by for instance military and surveillance technologies and occasionally distorts proportions. Calling for, in line with Knigge and Cope, “multiplicity of storytelling (...) counter-mapping that foregrounds contestation and alternative histories” they remind researchers to stay critical of the assumptions embedded within these services. Along these lines, media scholar Nanna Verhoeff has suggested that if scholars take these measures and engage with exploratory methods, digital cartography can be seen as stimulating a navigational rather than a mimetic practice. Verhoeff contends that where cartographers in the analogue era were concerned mainly with their representations’ accuracy, digital cartography can privilege navigation, multiple perspectives and place the meaning-making process with the user.

While this may perhaps not be taken as reflecting a generalised view among historical GIS scholars on the affordances of digital cartography, I would argue that Verhoeff’s characterisation certainly encapsulates the epistemological underpinnings of GIS uses among new cinema historians. Each in their own way – either through research papers or interface design – new cinema history projects tend to align with reflexive approaches to GIS, and in particular their engagement with Grounded Theory. For example, Klenotic's use of mapping tools in the Mapping Movies-project aims at reflecting the contingencies which affect research outcomes and the constructedness of knowledge inspired by and recapitulating the principles of Knigge and Cope's Grounded Visualization. As Klenotic explains:

...if our approach emphasizes the open, iterative and reflexive nature of mappings as part of a landscape of inquiry that is always adjusted and readjusted, then we may seek to redefine asynchronous layers of information as an opportunity to explore critically cinema's spatiality and history from a series of partial,

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828 Ibid., 111 and 124.


830 Ibid.

dialogical, partially contradictory viewpoints that are always under construction.\textsuperscript{832}

In a like-minded fashion, Allen remains critical of GIS’s capacities to establish historical relations. He refers to de Certeau’s notion of “historiographical operation” to emphasise history-writing as a contingent practice, of which the conditioning institutional and technical circumstances of production must be understood.\textsuperscript{833} Elsewhere, Allen has also drawn on Nigel Thrift’s non-representational theory to highlight the contingencies of historical representation with GIS.\textsuperscript{834} Thus, by highlighting how scholarly analysis of spectatorship implies “...coming to terms with the intractably unrepresentable nature of historical experience”, \textit{Going to the Show} can be said to indicate a step away from the “realist response” which his socio-economic film history, co-written with Gomery, articulated in the mid-1980s.\textsuperscript{835} In addition, also \textit{Cinema Context}, while relying on Google Maps, arguably shows a reflexive attitude by allowing researchers to search and extract film title data of for instance a production company, city or year(s), to explore and visualise it in alternative ways.\textsuperscript{836}

While not focusing on historical patterns but on contemporary, global distribution and exhibition, Deb Verhoeven’s recent \textit{Kinomatics} mapping project takes a similar position by drawing on literary theory in addition to Exploratory Data Analysis. Using a greater variety of visualisation software, such as ArcGIS and Tilemill, the project's researchers visualise data from their Global Movie Screenings database consisting of approximately 29000 cinemas in 48 countries, collected by external data providers.\textsuperscript{837} Consequently, the \textit{Kinomatics} project gestures towards a total, macroscopic perspective while inviting iterative and exploratory uses of them. Verhoeven has emphasised how digitised film-related sources need to be browsed with search tools that allow for serendipity.\textsuperscript{838} She refers to Stephen Ramsay, who has argued, that the precision of the results of Google’s search engine tends to confirm our already established views of relations and genealogies.

\textsuperscript{832} Ibid., 73.
\textsuperscript{833} Robert C. Allen, op.cit., 2011, 54.
\textsuperscript{835} Robert C. Allen, op.cit., 2011, 51.
\textsuperscript{836} See: \url{http://www.cinemacontext.nl/}, last accessed January 24 2017.
\textsuperscript{837} See \url{http://kinomatics.com/category/visualisations/} and \url{http://kinomatics.com/tools/}, last accessed January 24, 2017. Besides the use of ArcGIS and Tilemill for GIS visualization Kinomatics also applies the open-source software Oriana to create circular visualizations and Tableau which offers a wider range of classic statistical representations relying in part also on \textit{R}. These external parties are Rentrak and Box Office Mojo, see \url{http://www.rentrak.com/} and \url{http://www.boxofficemojo.com/}, last accessed January 24, 2017.
of culture, rather than challenging and recasting them.\footnote{Stephen Ramsay, “The Hermeneutics of Screwing Around; or What You Do with a Million Books”, in Kevin Kee (ed.), Pastplay: Teaching and Learning History with Technology. (Ann Arbor: University of Michigan Publishing, 2014) 117.} This way of searching seldom allows for discovering surprising, fruitful ressemblances between words across texts, or what Ramsay provocatively dubs ”screwing around”.\footnote{Ibid.} In highlighting this point, Verhoeven calls for less streamlined exploration and visualisation of spatial cinema data in line with the positions taken within the New Cinema History projects discussed above. While the interfaces developed by new cinema historians may not fully support such endeavours it is a central ambition to several of the field's scholars to facilitate exploratory and iterative search.

To conclude, based on the new cinema history projects I have discussed in this section, this research tradition’s conception and use of visualisations primarily follow the procedures of qualitative data analysis, using software such as Atlas.ti and ArcGIS. The projects which represent time dynamically primarily use a key dates approach, determined by their source material, while using both digitised, historical maps and contemporary GIS. Reflecting the critiques of serial history, the projects tend to enable multi-scopic perspectives, in which the user can challenge, test or complement the map's macroperspective against the micro-perspective and bottom-up scale of more limited distribution circuits and cartographic sources pertaining to smaller urban areas. In this sense, new cinema historians stress the affordance of seeing cinema history from above with maps for the sake of understanding especially the spatiality of distribution patterns, while testing and writing it from below. In doing so, they arguably constitute an advanced congregation of methods and techniques from the earth and social sciences, Annales historiography as well as film historiography's own version of total history, as initiated by Jean Mitry. Yet, taking a reflexive approach informed by developments of GIS in especially human geography, history and the social sciences, it does so in a way which constantly seeks to acknowledge its own limitations and lets users challenge them. In this particular aspect, New Cinema History in the digital age distinguishes itself from New Film History’s realist stance as articulated by Allen and Gomery, by nourishing a shift in its methods, which allows for greater serendipity. Moreover, it can also be said to nurture, as argued by Lagny along the lines of Annales historiography, a greater methodological pluralism.

Having discussed the epistemological implications of contemporary GIS-based New Cinema History and the scholarly negotiations of its representations' evidentiary status, my next section will reflect upon the case study of the project Data-driven Film History: a Demonstrator of EYE’s Jean Desmet Collection, completed in 2015, in collaboration between Amsterdam's EYE Filmmuseum,
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the University of Amsterdam and Utrecht University. This case study has particular relevance for two reasons. First of all, it lends itself particularly well to a discussion of how a GIS representation can be used for gaining new insights into film distribution and exhibition, following the conventions of New Cinema History methods. Discussing the project from an insider's perspective, I will elucidate its making and its methodological choices while considering it in relation to the three key aspects considered in this section, namely the choice of map type, the representation of historical time and reflexivity towards data interpretation. Second, the project provided an opportunity for me to reflect on New Cinema History methods as a builder who wished to open new research avenues which challenged their conventions by trying to bridge textual and contextual analytical approaches. This will be the focus of part 4.3 in which I discuss the limitations and promises of this experimental project component.

The Desmet Collection's Business Archive as Source for New Cinema History

The Jean Desmet collection, preserved at the EYE Filmmuseum in Amsterdam, contains the archives left behind by Dutch film distributor and cinema owner Jean Desmet (1875-1956). As a distributor, Desmet was most active in the early period of silent cinema and its transitional years. The collection consists of approximately 950 films produced between 1907 and 1916, a business archive of more than 100,000 documents, some 1050 posters and around 1500 photos.

Roughly, the Desmet collection's archival life begins after 1916 when Desmet’s activity as a film distributor largely came to a halt. Beyond 1916, Desmet devoted his business activities primarily to real estate investment while remaining active as a cinema owner into the 1920s, in particular of the succesful Cinema Royal in Amsterdam and, throughout the following decades, also of the Cinema Parisien. In this period, the collection did not occupy a prominent place in Desmet's activities, although he occasionally continued to rent out films and also sold some off. Upon a fire in the Cinema Parisien in 1938, in which

841 At the University of Amsterdam the project was related in particular to the research program CREATE: Creative Amsterdam - an E-Humanities Perspective which focuses on the historical emergence of creative industries in Amsterdam See: http://www.create.humanities.uva.nl/, last accessed January 24, 2017.
844 Ibid.
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descriptions and small posters for primarily long feature films were destroyed, Desmet did however secure his collection better storage facilities and began inventorying it.845 This created the fundament for what is now known as the EYE Filmmuseum’s Desmet Collection. In this and the following sections I focus primarily on Desmet's business archive as a source for New Cinema History and GIS mapping.

Within the EYE Filmmuseum, the Desmet collection’s history dates back to 1957, when the then still small institution with limited funds was known as the Stichting Nederlands Filmmuseum and was part of Amsterdam’s Stedelijk Museum.846 In this year, which followed Desmet’s death in 1956, the Filmmuseum received his collection of films, posters and photos.847 The business archive was gradually acquired between 1962 and 1970.848 While the conservation of the Desmet collection was regarded a high priority already when it was acquired under director Jan de Vaal, it took long before it was properly inventoried and presented. Several initiatives during the following decades led to the gradual disclosure of the collection’s different materials. The posters were for instance largely neglected until the Filmmuseum put a renewed effort into its poster collection in the late 1980s.849 Throughout the 1990s and 2000s the Desmet collection engendered a fresh perspective on historiography of especially Dutch film distribution and exhibition as well as of the production companies prominently present in the collection. A significant reason for this is that the collection contains a rich business archive of around 100,000 documents, comprising Desmet's meticulous notes on his transactions with cinema traders and exhibitors. These sources have allowed researchers to see exactly where Desmet acquired his prints from, and to whom he rented them out.

Film historian Ivo Blom has studied the collection's source material from a micro-historical perspective to depict Dutch film culture’s emergence and sketch the macropatterns of distribution sustaining it, by tracing Desmet’s trajectory as a personal collector and businessman within his specific socio-historical context.850 This focus was in part motivated by the peculiarity of Dutch film culture, which, in comparison to other large countries such as France or the US, has traditionally not had a large, domestic film production. Also, cinema traders were not associated with specific

845 Ibid.
846 Ibid., 308.
847 Ibid., 308-309.
848 Ibid., 309.
849 Ibid., 311.
850 Ibid., 21 & 23.
production companies but remained independent.\footnote{Ibid., 28.} Prior to the first world war, the Netherlands was in many aspects an open country when it came to film distribution, in several ways similar to Germany and Great Britain in the sense that distributors would not be contracted to take on a certain amount of films and could buy more freely, also second-hand, as did Desmet.\footnote{Ibid., 27 and 31.} In this regard Jean Desmet is a particularly interesting figure whose trajectory and business transactions provide a rich trace of Dutch and European film culture's development.\footnote{Ibid., 33.} Because of its unique historical value, the Desmet Collection was inscribed on UNESCO’s Memory of the World register in 2011.\footnote{“The Desmet Dossier,” accessed 11 June 2015, https://www.eyefilm.nl/en/collection/selection/collection-dossiers/the-desmet-dossier; “Desmet Collection,” accessed 11 June 2015, http://www.unesco.org/new/en/communication-and-information/flagship-project-activities/memory-of-the-world/register/full-list-of-registered-heritage/registered-heritage-page-2/desmet-collection. Many of the films can be viewed online, via the EYE channel on YouTube (https://www.youtube.com/playlist?list=PLB95B99C2420D32F3) or via the Open Images platform (http://openimages.eu/en). The posters are accessible via EYE’s page on the EFG website (http://www.europeanfilmgateway.eu/nl/node/1419). The project was funded by the Netherlands Organization for Scientific Research (NWO) and ran from August 2014 to April 2015. For more information, see the project website: http://mappingdesmet.humanities.uva.nl, last accessed January 24, 2017.} Today, the Desmet collection has been almost entirely digitised as part of the Images for the Future project that ran between 2007 and 2014. This opens the possibility of developing fresh historical insights into early cinema, by studying the collection as data using digital techniques and representational practices to intervene analytically. The aim of the project Data-driven Film History: A Demonstrator of EYE's Jean Desmet Collection's, was to consider how contemporary forms of data visualisation might be instrumental in reassessing our perspective on issues such as film distribution, exhibition and the uses of colour in cinema's early years.\footnote{The project was funded by the Netherlands Organization for Scientific Research (NWO) and ran from August 2014 to April 2015. For more information, see the project website: http://mappingdesmet.humanities.uva.nl, last accessed January 24, 2017.} As a small-scale project, lasting eight months part-time, it involved academic researchers at the Universities of Amsterdam and Utrecht, staff from EYE Filmmuseum, and two technical partners, one for developing the interface and one for performing the data mining.\footnote{Beside the author, the project team consisted of Professor of Film Heritage and Digital Film Culture (UvA) and Chief Curator at EYE Filmmuseum Giovanna Fossati, Professor of Digital Heritage (UvA) Julia Noordegraaf, Assistant Professor Film Studies (UvA) Eef Masson, Assistant Professor Television and Digital Culture (UU) Jasmin van Gorp, software developers Justin van Wees and Bart de Goede (Dispeectu), online video application development Niels Sondervan, Jeroen Sondervan and Dean Janssen (Hiro), Annelies van Nispen, Saskia Waterman, Rommy Albers and Elif Rongen-Kaynakçı (all at EYE). The project also benefited from a user study conducted by Liliana Melgar (then PhD candidate at Universidad Carlos III de Madrid and intern at EYE).}

From an academic perspective, the project’s main objective was to develop a map interface for studying the distribution and exhibition history of the collection’s films. In particular, the project wished to explore the usefulness of GIS mapping in establishing relations between the distribution and screening of the films. For EYE, the film archive involved, the objective was to gain a better
understanding of the quality of its metadata on the Desmet collection, and to experiment with new ways of providing access to it.

**Mapping Desmet**
The main goal of the *Data-driven Film History*-project was to facilitate the scholarly study of the spatio-temporal patterns of distribution and screening of the films’ owned by Jean Desmet through a GIS map visualisation. By providing macro-visualisations of their distribution and screening, *vis-à-vis* micro-descriptions of the individual films, the project aimed at reuniting all available transcribed data on the collection in a single map interface that could facilitate the navigation of the abundant information, and inspire new research directions. The interface was designed to help researchers visually represent contextual information and map it onto the titles of films in the collection. In the process of reaching this goal, the project presented several intriguing methodological issues, which I reflect upon here in hindsight with regard to the aspects and strategies of map representation, temporality and reflexivity which I discussed in the previous section.

With regard to the map representation and interface design, one feature of the Desmet collection in particular became key at a very early stage: the circumstance that it is documented in three different databases, which vary amongst each other in terms of the types and amounts of information they hold. The process of developing a mapping interface, and in particular, the step of combining metadata originating from different sources invited the project participants to consider the data’s limitations and how it conditioned the historical insights which could be produced in this format. In this sense, the heterogeneity of the datasets deriving from those three databases formed a starting point for the interface development and eventually became its backbone.

The first dataset is derived from Collection EYE, EYE’s institutional catalogue, and contains titles from Desmet’s catalogue that the institution holds material for, for instance a film print, still, poster or advertisement. This is the most complete dataset with regard to the Desmet Collection, as it comprises around 950 titles out of the 1500 to 2000 films Desmet acquired and distributed during his active years. Unfortunately, Collection EYE contains limited, not to say almost no information on their distribution or screening. In the form it was received within the project, it consisted uniquely of attribute data and no spatial data. With regard to EYE’s dataset, it was therefore the project’s hope to spatially reference as many titles as possible, by linking it to the two remaining datasets.

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857 It should be noted that Collection EYE contains relatively more detailed information on Dutch films distributed by Desmet – even when no physical items are present in the collection.
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The second dataset was created by Rixt Jonkman, Registrar at EYE, who, while still a student, had made a detailed transcription of distribution and rental information from Desmet’s business archive. Jonkman manually entered data on the rental, exhibition and distribution of the 771 films mentioned in the account books that were purchased from two German distribution companies between 1910 and 1912: Westdeutsche Film-Börse (WFB) and Deutsche Film Geselschaft (DFG). These films were typically shown in ‘programmes’, containing a number of short films followed by a longer one - a circumstance I shall return to, when discussing the colour visualisations created in the project in the next section. While it is the most reliable source with regard to both attribute and spatial data, the latter in the form of distribution information, the dataset only covers, for the reason mentioned above, films acquired in the period from 1910 to 1912, of which several are today no longer preserved.

The third and last available dataset is derived from Karel Dibbets’ Cinema Context database, which, in addition to Desmet’s business archive, relies on newspaper clippings and reports from the Centrale Commissie voor de Filmkeuring (Central Commission for Movie Ratings, installed in 1928) to establish where and when films from the collection were shown in the period it covers. Cinema Context however only includes information for one screening a week – typically the premiere screening – for each film title. It should be noted that in 2004, data from the Jonkman database were integrated into it and that Cinema Context has been updated since this integration. For example, unidentified film titles have been identified or Dutch distribution titles have been replaced by original titles, for which reason not all titles in the Jonkman dataset match those in Cinema Context today.

In order to render visualisations from three different datasets, we sought to find a strategy for coping with the many differences in terms of how they each described the films in the collection. Especially the titles and screening dates diverged considerably between the datasets, and therefore, the items this information concerned could not be easily matched. For instance, the three datasets used titles in different languages, the original title vs. the Dutch distribution title, or, in the case of an unidentified film, even a catalogue title. By analogy, the datasets also used different dates, as some considered the year of production, while others adopted the year of release or that of the first screening – if they had dates at all. Although metadata specialists and curators at EYE invested great effort into disambiguating titles by matching a good deal of them manually - providing a good opportunity for cleaning up EYE’s records – there continued to be discrepancies in information and

duplication in titles. During this process, it was possible to match 1.094 items, so that we ended up with 2.361 unique film titles. As the total amount of Jean Desmet films is estimated at 1.500 to 2.000, this means that there are probably still many duplicates, meaning items that reference the same film but have different titles attached, within our final set.

As a map representation for visualising this data we opted for, along the lines of CinemaContext, a Google maps interface as a basemap without any map overlays. Early in the process, we did consider making a map overlay from a historical map, yet the budget and timeframe of a project of this scale did not allow for performing such a complex digitisation task nor licensing a digitised historical map. Therefore, the interface does not constitute as complex a temporal relation with the collection and its sources as for instance the projects Early Cinema in Scotland and Going to the Show where historical maps were used to create a historical periodisation. In this respect, our project’s representation did show evident limitations in terms of the temporal frame it suggested, which remained within largely a presentist perspective. However, as I will discuss below, I would argue that the interface’s functionalities allowed researchers to establish historical dynamic temporal relations in other complex ways.

These decisions resulted in the following organisation of the interface's design and navigation. Upon entering the demonstrator, the user is shown the map of the Netherlands. This map constitutes the macrolevel of the interface where patterns can be discerned on the national level, specifically with regards to comparing the different numbers of distributions or screenings in the different Dutch cities. In the upper left corner appears a key naming the three datasets (see figures 36 and 37).

Checking the box next to one of them produces the total numbers of titles associated with one or more datasets, mapped onto the cities in the Netherlands where they were distributed or shown. At city level these numbers are merged when choosing multiple datasets, appearing in a blue circle.
Furthermore, it is possible to delimit the numbers, using the metadata categories of EYE primarily, according to genre, colour and for instance production company. This feature, in theory, allows for individual distribution case studies to be made. For instance, if a researcher wishes to study the programming of Pathé films in the silent years in the Netherlands, or of a particular genre. An additional central feature is the interface’s timeslider, which is included in the upper left box, and which allows for delimiting the production period of the films mapped. With this functionality it is possible to take a key dates approach centered around production years to study corpora from Desmet’s collection. This feature is interesting in terms of how it allows to establish spatio-temporal sequences in the interface. For instance, delimiting the mapped films to a specific year of production may make it possible to study for how long a period those films circulated and were screened. In this aspect, one may in theory use the functionality to make inferences about the distribution life cycle of the films and their spatial sequence. For instance one can imagine questions about whether films would be distributed first in some cities and if there was a hierarchy between cities in the distribution of specific titles or make observations about if or when films go out of circulation.

At the same time, the numbers also reveal patterns that suggest they should be approached with caution. For instance, the city with the highest number of distributions and screenings, 1050, is the smaller town of Dordrecht in the South of the Netherlands, which by far surpasses Amsterdam with 764, and Rotterdam with 201. As we know that the two latter were the two most important cinema cities, these numbers point to the fact that the dataset contains much more information on Dordrecht than the other two and that the numbers are therefore too skewed to reflect accurate proportions between them. There are two likely reasons for this. First, that the number of distributions in the dataset created by Rixt Jonkman is much higher than in the Cinema Context dataset. Second, a lack of disambiguation between titles. This observation can be considered a valuable experience of building, in the sense intended by Ramsay, because the process of creating the interface exposed bias in the data, which we might not otherwise have noticed.

Though the specific issue of the proportions between the numbers was not anticipated at the start of the project, we did from the outset want to avoid giving the merged numbers appearing on city level interpretative authority by pointing to the datasets’ uncertainties.859

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859 This ambition emerged as a central point at the staff meeting at the University of Amsterdam’s Mediestudies Department on September 16, 2014, in which, in addition to the author also Julia Noordegraaf, Rommy Albers, Giovanna Fossati, Eef Masson and Jasmijn van Gorp participated.
Fig. 38 Screenshot of list of films screened and distributed in the city of Amsterdam. The colour coded dots preceding the titles identify the databases which the information is derived from.

Fig. 39 Screenshot of metadata fields and categories listed for the film Agrippina (1911); the colour coded dots identify the databases which the information derives from.
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In order to do so, it was decided early on to follow Drucker’s advice to find ways of visualising data contingencies in the interface design. For the project’s interface, we thought this could be done in practice by foregrounding the data’s provenance so as to highlight the limitations of the project’s sources. Doing so should allow users of the demonstrator not only to assess the data’s status, but also to determine what they can or cannot gain insight in when using it.

While developing the tool, the principle of provenance was implemented on several levels. In the key, the datasets are colour coded, and the same coding is used in the list of films that is shown when the user clicks the figure for a particular city (see fig. 38). Since there were no details on the distribution or screening for all of the films which it is known Desmet owned, a list of those titles was also made accessible through the interface.

To access this list, the user can click on the EYE logo in the North Sea area of the map. Moreover, at the title level, coloured dots are used to show which dataset specific information on genre, production, screening, etc. derives from (see fig. 39). This colour coding follows the data all the way through the navigation. In this sense, the colour coding may be taken to invite the users to take a multi-scopic approach. While it is possible to make inferences on the macro-level, the numbers are constantly brought into question when entering the layers of the cities and titles below it with specific attention to the films individual distribution and exhibition histories. Finally, as an additional way of securing transparency to support this design, the datasets were also made available through the website of the associated research project CREATE: Creative Amsterdam – An E-humanities perspective.

To conclude, the project’s reliance on the three datasets, which document the distribution and exhibition of the Desmet Collection, turned out to be a decisive factor in the development of the project’s interface. By colour coding each dataset and making the provenance of the data visible in the demonstrator, the project sought to ensure that researchers stay aware of the fact that they use information produced under different conditions and with different purposes in mind, and to encourage them to consider how this affects the relations they establish between the distribution and screening of the Desmet films, or any other film historical observations they might make. In this sense, rather than taking a more traditional New Cinema History approach focusing on networks between people and industrial and creative sectors to study their complex societal dimensions the project placed greater emphasis on the role, and problems, of the archive as an a priori for historical interpretation. The interface design’s emphasis on the archival sources

860 Johanna Drucker, op.cit., 125-126.

861 For access to the project’s datasets, see http://www.create.humanities.uva.nl/results/desmetdatasets/, last accessed January 24, 2017.
provenance could be described as reflexive in that it brought attention to the contingent processes of their making and interpretation. At the same time, one may also, in hindsight, raise the question whether the project actually did succeed in developing a convincing strategy. On the one hand, the demonstrator followed Drucker’s suggestions for the development of ambiguous data visualisations, as the users are constantly confronted with the limits of the representation, through the tool’s transparency. Furthermore, by making the underlying data available through the website of the CREATE project, the project certainly does allow for and encourage alternative or “rivalling” interpretations of the data, to recap the words of Knigge and Cope. On the other hand, one might also argue that the interface’s colour coding is quite conventional and follows classic, scientific principles of source criticism, as have existed since the nineteenth century. In particular, by grouping the datasets into their specific collection provenances instead of merging them, the project’s use of the data respected such fundamental provenance principles as “respect des fonds” and “respect de l’ordre”, as they were referred to in the manuals from the École nationale des chartes.862 As media scholar Andreas Fickers has explained, “respect des fonds” prescribes that “archival materials, when transferred to archival custody, remain as distinct collections catalogued and filed according to their creator or office of origin”, and “respect de l’ordre that “records in these distinct collections are maintained in their original order”.863 Without reflecting on these principles in the process of making the demonstrator it seems, in hindsight, that we intuitively applied them rigorously, by letting the collections remain clearly separated through the colour coding. Though the checkboxes do allow to serialise the datasets according to new categories they are constantly interpreted in relation to their archival origins and order. I would argue that to develop the demonstrator towards a greater degree of reflexivity, beyond the transparency of colour coding the datasets and making them freely available, it could have been productive to consider incorporating Exploratory Spatial Data Analysis strategies. For instance, this could be done by incorporating personal note-taking techniques into the interface as a way of inviting different interpretations. In this way, researchers could be allowed to combine items from the datasets in their own “hermeneutical units” and map them in new, meaningful ways to produce alternative historical inquiries or case studies.

In addition to developing a mapping interface, we also tentatively experimented with visual analytics for colour. Seeking to integrate visualisations of colour patterns in Desmet films in the interface, we tried to develop new insights into the collection’s significance for early cinema


863 Ibid.
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history. Furthermore, in doing so, we wished to renegotiate the divide between New Film History and New Cinema History by seeking productive combinations of textual and contextual historical analysis. In the next section I discuss this experiment and the potential avenues it opens for new types of data-driven research.

4.3 Back to New Film History? Analysing Chromatic Patterns in Desmet’s Programs

An important reason for our experiment with combining the project's map interface with visualisations of textual patterns was a wish to challenge the divide between textual and contextual digital methods in film historiography. With, on the one hand, Cinemetrics' resurgence of a classic, scientistic paradigm of stylometrics alongside distant reading and Exploratory Data Analysis and, on the other, the shift from New Film History to New Cinema History, a gap seems to have been created between research traditions. Even though there have been attempts at combining approaches from the perspective of Cinemetrics, as in Digital Formalism's ecdotic study of the Blum affair, this yet remains to be explored to a greater degree. Moreover, within New Cinema History, imbued with Annales historiography's concepts of mentality and total history, there is little room for understanding cultural products as historical sources.

Such a methodological divide, is not desirable when dealing with such a rich corpus as the one offered by the Desmet Collection. For instance, we found that the films in the Desmet Collection and their features are valuable sources for understanding spectatorial expectations and habits, and that it would be difficult to analyse them as such within an orthodox New Cinema History paradigm. Previous scholarship has understood the Desmet films as reflecting popular, cultural conceptions of and expectations from the film medium's conventions, which the masterpiece histories had neglected. The project's experiment could be said to align itself with and propagate New Film History’s emphasis on films’ performative dimension. It wished to take a step back from the recent paradigmatic shift from film to cinema history, and re-introduce a more medium-specific focus in digital research, thinking from the Desmet Collection, as the basis for understanding spectatorial habits and performance. In doing this, we explored preconditions for a combined digital research format for the analysis of early cinema's formal and spatial characteristics. We specifically focused on silent cinema's colour palettes in the context of its historical exhibition, drawing on GIS-based scholarship, cinemetric techniques and Cultural Analytics.
The Desmet Collection as site for Silent Cinema Colour Historiography

Concurrently to our research project in 2015, EYE Filmmuseum organised the conference *The Colour Fantastic: Chromatic Worlds of Silent Cinema* hosting a broad range of papers on the history and (digital) restoration of primarily silent cinema's colours. The event, which gathered a wide array of international scholars and film preservationists, among other things reflected on the institution's long-standing engagement with the historiography of silent cinema's colours as well as early cinema more generally, attending to the crucial role of the Desmet Collection in it. As preparations for the *The Colour Fantastic* took place, we found inspiration in this institutional history to articulate questions which would allow for combining the project's mapping interface with visual analytics of film colours. In the following, I discuss how, by attending first to the archival life of the collection at the EYE Filmmuseum.

In 1970, the Filmmuseum presented an inventory of the Desmet Collection counting 897 titles. Resulting primarily from archivist Peter Westervoorde's cataloguing and Jay Leyda's help as FIAF’s identification specialist, it laid the foundation for the collection's conservation and rediscovery. The collection's conservation gained momentum in the 1980s and 1990s when funding from within the institution and the Dutch Ministry of Culture became gradually more generous. Moreover, in the late 1980s an increasing number of renowned, international film historians visited the collection, after restorations had begun circulating in the archival film festivals. As film historian Ivo Blom recounts:

> Festival screenings and retrospectives made an immediate impact, and the Desmet films played an important role in the rewriting of film history to dissertations and publications on early German and Italian cinema, forgotten or undervalued film companies such as Vitagraph and Eclair, early non-fiction films, genres such as the early Westerns and early colour films.

The film collection's significance for historiography is due in large measure to the fact that its conservation unearthed many films previously considered lost. It enabled film scholars to expand

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866 Ibid., 319 and 323. As Ivo Blom specifies, in the late 1980s the following number of titles were conserved: 67 in 1986, 69 in 1987, 40 in 1988 and 93 in 1989.

867 Ibid. Blom for instance mentions Susan Dalton then of the American Film Institute, historian of American early cinema Ben Brewster, Italian film historian Vittorio Martinelli and Henri Bousquet who throughout the 1990s published the to date most comprehensive catalogue of Pathé productions in the silent era.

filmographies of national cinemas, knowledge of genres, technology, directors and production companies. In this regard, Blom considers the screening of the colour restoration of *Fior di male* (Carmine Gallone, Cines, Italy, 1915) at Le giornate del cinema muto in 1986 a key event. As he writes about the screening: "The established 'canon' of classic films and directors was sent into free fall by the screening of a film which up to that moment, had simply been ignored by film history."\(^{869}\) *Fior di male* emerged at a point when scholarly attitudes towards Italian silent cinema were changing drastically.\(^{870}\) Until then, scholars had hesitated to study especially the late Italian silent period because of its fascist societal context of production.\(^{871}\) Furthermore, Italian film heritage preservation had been characterised by dispersed sources, lacking inventories and reference works for identification and research.\(^{872}\) In the slipstream of the Associazione Italiana per le Ricerche di Storia del Cinema Italiano's foundation (1964) and the emergence of Italian regional film archives research on pre-WWII Italian cinema proliferated.\(^{873}\) Monographs by film historians Vittorio Martinelli, Aldo Bernardini and Gian Piero Brunetta as well as the silent cinema review *Immagine. Note di Storia del Cinema* appeared. These authors had also contributed to *Les cahiers de la cinémathèque*'s 1979-double issue (nos. 26 -27) devoted to revising Italian silent cinema historiography and had, in line with microhistory and emerging approaches in New Film History, critiqued Sadoul's generalist historiography to instead study regional production and exhibition contexts in Italy.\(^{874}\) The case of Italian silent cinema exemplifies how the restored Desmet films, and in particular *Fior di male*, emerged against a backdrop of institutionalised scholarship which increasingly studied early films and their performance as valid expressions of popular (regional) cultures beyond the masterpiece model of history.

Beyond this rediscovery, the collection stimulated profound insights into early cinema's formal and material characteristics, such as genre conventions and colour uses. Though methodological...
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literature had emphasised it, the fact that the majority of silent films applied a colour process – tinting, toning, stencilling or combinations – had been understudied. For instance, Sadoul's foundational essay on historical methodology had urged film historians to study nitrate projection prints to understand silent cinema's conventions of colour uses.\(^{875}\) Notwithstanding, predominant archival practice remained to copy coloured source elements onto black and white film stock – a practice also resulting from a lack of laboratory expertise and funding for restoration.\(^{876}\) When the Filmmuseum invested more energy into restoring the Desmet collection in the 1980s, it decided to attempt reproducing the original elements' colours, sustained by an increased awareness in restoration theory and laboratory practices. As Peter Delpeut, then the Filmmuseum's Deputy Director, has recalled:

New funds, innovative laboratory techniques and a greater sensibility towards the importance of original monochrome colour schemes of silent films had paved the way for a veritable revolution in restoration ethics and – by the same token – aesthetics.\(^{877}\)

The Pordenone screening of *Fior di Male* in a colour print followed in 1987 by colour restorations of Vitagraph films resulted from this development.\(^{878}\) Gradually thereafter, the need to restore silent films' colours became a generalised deontology in film archives, and was increasingly emphasised in film preservation and history publications during the 1980s and 1990s.\(^{879}\)

Since then, the Filmmuseum has continuously raised new questions on silent cinema's colours by

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\(^{875}\) Georges Sadoul, op.cit, 1974 [1964], 58.

\(^{876}\) Ibid., 315.


\(^{878}\) Ivo Blom, “The Impact of the Desmet Collection. Pordenone and Beyond”, in *Journal of Film Preservation*, No. 87 (2012)39. However, as EYE Filmmuseum's silent film collection specialist Elif Rongen-Kaynakçı has pointed out it is important to keep in mind that within the context of Pordenone's programming in 1987, only ten titles out of approximately 350 were in colour. The transition towards showing silent films in colour did, in other words, not happen overnight. See blog post, "Elif Rongen-Kaynakći on 'The Colour Fantastic' at EYE, March 28-31, 2015". See: [http://orphanfilmsymposium.blogspot.nl/2015/02/elif-rongen-kaynakci-on-colour.html](http://orphanfilmsymposium.blogspot.nl/2015/02/elif-rongen-kaynakci-on-colour.html), last accessed January 24, 2017.

\(^{879}\) Peter Delpeut, op.cit., 18. As Peter Delpeut has recounted, beyond the Nederlands Filmfuseum, a film archive such as la Cineteca del Comune di Bologna (today la Cineteca di Bologna), which the Nederlands Filmmuseum then collaborated closely with in organising Il Cinema Ritrovato, began investing greater efforts in colour restoration in the late 1980s by unearthing original, coloured prints of especially diva films such as Amleto Palermi's *Carnevaleasca* (Cines, 1918) and Carminio Gallone's *Malombra* (Cines, 1917). See also: Monica Dall'Asta, Guglielmo Pescatore and Leonardo Quaresima (eds.), *Il Colore nel Cinema Muto* (Bologna: CLUEB, 1995); Giovanna Fossati, “When Cinema was Coloured,” in Luciano Berriatúa et al. (eds.), *Tutti i colori del mondo. Il colore nei mass media tra 1900 e 1930/All the Colours of the World. Colours in Early Mass Media, 1900-1930* (Reggio Emilia: Diabasis, 1998); Joshua Yumibe, *Moving Color: Early Film, Mass Culture, Modernism* (New Brunswick NJ/London: Rutgers University Press, 2012).
organising international symposia and exploring new restoration techniques. In 1995, it organised and hosted the workshop *Disorderly Order – Colours in Silent Film*, where identified and unidentified archival films were screened to an international audience of film historians and curators to revise the historiography of silent film's colours. Several interesting questions and remarks were put forth in this context which, twenty years later, provided inspiration for our *Data-driven Film History*-project. For instance, following a screening of both early and late silent era films, media scholar William Uricchio asked Giovanna Fossati whether the colour uses in different periods seemed to follow different patterns. As Uricchio phrased this:

I'm curious about the range of colour effects we've seen – a range of technical systems and visual effects that cover a relatively long period during which, within many national cinemas, there's a standardisation of certain dramatic forms, certain camera techniques, yet so many variations in colouring. Giovanna Fossati, have you found patterns in this, patterns differentiating genres, patterns differentiating particular procedures – Pathé versus Vitagraph, say – patterns across time, say 1912 versus 1922?  

Drawing on her fresh archival research, Fossati responded that certain techniques, particularly stencilling, appeared to follow distinct patterns within different production companies' applications, such as Gaumont and Pathé.  

Delpeut on the other hand expressed his doubt with regard to discerning patterns, stressing that each print contained a unique colour experience. As he remarked "...I could find no recipe, no hidden theory, no codes that applied to all the films I saw. This was very disturbing because we're always looking for logic, for codes..."  

Nicola Mazzanti, then affiliated with the Cineteca del Comune di Bologna and Il Cinema Ritrovato, elaborated on this observation to highlight how the contingencies not only of production but also films' screening history affected their colour schemes and composition. As he remarked concerning the Filmmuseum's print of Griffith's *The Lonedale Operator* (USA, 1911) "...the blue is stronger than at the left and right margins simply because the light of the projector has faded the colour in the centre of the nitrate print". Yet, as Mazzanti's later research into Italian silent cinema has shown, colours often did serve and support narrative aims, and audiences expected colourful programmes from exhibitors.

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881 Ibid.
882 Ibid.
883 Ibid.
884 Ibid., 24.
885 Nicola Mazzanti, “Colours, Audiences and (Dis)Continuity in the ‘Cinema of the Second Period’,” *Film History* 21, no. 1 (2009) 69
The developments sketched above – the increased scholarly attention to popular genres and silent cinema's colours – provided the basis for two research questions on the Desmet film collection. First, as film historians had become enthralled by *Fior di male* and the diva films' colours as expressions of narrative conventions and spectatorship expectations, we were interested in looking for relations between the films' colour patterns and their programming. Second, along the lines of the more general curiosity expressed by Uricchio and the insights of the responses to it, we wished to analyse if different periods, production companies and genres followed or established conventions, while remaining acutely aware of the traces left by their contingent production and screening circumstances and the project’s limited scope. Thus, the project experimented with visual analytics for colour to attempt combining the mapping interface with textual analysis of film as a historical source and cultural project to gesture towards new, combined research formats.

*Visualising the Chromatic Patterns of Desmet’s Distribution*

In the project’s context, we chose to focus specifically on analysing the colour palettes that historical audiences of the Desmet films would have been exposed to. In order to analyse these colour palettes, we chose a small corpus of the digitised Desmet films. We chose three full programmes – currently the sole full programs known to exist within the collection - with films from Desmet’s distribution catalogue. These three programmes had been screened respectively in two cinemas in Rotterdam in 1914, *De Gezelligheid* and *Concordia*, and one in the *Bellamy* in the smaller town of Vlissingen in 1915. As the table below shows (see fig. 40), each programme consists of a fairly conventional blend of genres for the time: a non-fiction film, a drama, a comedy and so on, and all consist of titles produced between 1912 and 1914. In several ways this choice limited the questions we could raise. For instance, we could not aspire to trace a fundamental development in colour uses from early to late silent cinema, along the lines of Uricchio’s question, just as we did not analyse the films specifically with regard to production company. The overviews thus produced were necessarily specific to a very selective number of historical places and times, and would not allow us to produce generalising statements with regard to film colours' development in these years. At the same time, we hoped they would allow us to consider the feasibility of making broader inferences on the basis of a more extensive sample – with regard to the geographic distribution or the development over time of colour use in silent film, or in films from specific

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886 For help with reconstructing these programs, we are indebted to Rommy Albers, Maike Lasseur and intern Leanne van Schijndel at EYE. One of the reconstructed programmes can also be accessed online via https://www.eyefilm.nl/en/collection/the-desmet-dossier/cinema-owner/a-night-at-the-cinema-in-1915, last accessed January 24, 2017.
Deploying the digital techniques for visual analytics we were familiar with and could get a hand on easily the project sought to explore these questions on different levels. At the most basic level, we sought to experiment with ways of producing visualisations of the sorts of colour schemes audiences were exposed to when visiting a cinema where Jean Desmet’s films were distributed and shown. By making visualisations of the hues featured in these programmes, we hoped to get an overall impression of the presence, range and/or distribution in time of the colours that contemporary audiences would have been exposed to – an impression impossible to obtain with the
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naked eye at the editing table. We hoped that the visualisations could be integrated with our mapping tool to also allow users to relate the macroscopic perspective of a map and its visualisation of distribution networks to the microscopic colour features of a film or film programme, through one and the same interface.

Among the visualisations of colour features which have been deployed by film scholars in recent years, Manovich’s use of ImageJ and creation of the ImagePlot plug-ins appealed to us. We found that its ability to work with large image sets could support a form of distant reading for films, with which to relate changes in colour patterns to production circumstances or concurrent historical events. Likewise, psychologist James Cutting’s tentative analysis of colour palettes in contemporary Hollywood films with Matlab intrigued us, because it allows for visualising film colours’ temporal changes.\textsuperscript{887}

In producing these visualisations, we were also acutely aware of the inherent contingencies of the material we worked with, reflected in the discussions of the 1995-workshop cited above. Throughout our discussions we reminded ourselves that colours were historically 'disorderly ordered', and that, even if we now to a greater degree tend to acknowledge their role in silent cinema’s processes of signification within specific genres, such as for instance diva films, we still know very little about the highly contingent factors that shaped their patterns.\textsuperscript{888} In retrospect, then, we cannot consider colours during the silent era as fixed categories. Moreover, despite its extensiveness, the Desmet collection hardly stands as a comprehensive representation of the entirety of the production and circulation of films in the period. And, last but not least, anyone who has been involved in film archival practices will know how the duplication of film for restoration or access purposes, both analog and digital, can affect the rendering of the colours originally applied to black and white film.\textsuperscript{889} When it comes to colour research, then, we considered archival and laboratory work as, using Delpeut’s expression, activities of “editing film history”.\textsuperscript{890} For those reasons, we


\textsuperscript{888} Nicola Mazzanti, op.cit., 2009, 78.


\textsuperscript{890} Daan Hertogs and Nico De Klerk (eds.), op.cit., 24.
could not, at this stage, consider colour in these films in any other way than a very exploratory one – nor aspire to go beyond the Desmet collection as an object of analysis. By taking this stance, we could say in hindsight that we implicitly approached the collection with the attitude of a micro-historian who aspires to gesture toward or suggest macro-patterns by studying the collection of one specific individual within a medium-specific, New Film History approach.

In the project's visualisation work, which I was responsible for carrying out, we primarily used ImageJ/ImagePlot. This choice was made after we had also looked into applying Frederic Brodbeck’s Cinemetrics software for colour visualisation - not to be confounded with Tsivian’s Cinemetrics – which however turned out not to be feasible to apply within our project. On a practical level, this choice was motivated by the tool's accessibility and thorough documentation, which made it easy for us to use without programming knowledge. In addition, as I have discussed, ImageJ/ImagePlot is also one of the few visualisation tools to have been picked up by media scholars to study archival film, classic and contemporary cinema, albeit still on a small scale. We argued that having other scholarly projects as points of comparison would allow us to situate our efforts within an ongoing scholarly debate on the potential of the software’s techniques for developing new perspectives on stylistic and socio-economic film history.

Using the ImageJ software, each of the Desmet programmes’ video files was broken down into image sequences consisting of all the films’ single frames. In each case, this produced image sequences of more than 100,000 images. Programmes 1, 2 and 3 respectively consisted of 167,440, 135,182 and 159,705 images. From these sequences, we created different types of visualisations – first for the full programmes, and then for the individual films – so as to find out which kinds of patterns each would reveal. We hoped this would allow us to reflect on the qualitative differences between them, and the respective analytical potential of the visualisations. Using the montage visualisation format for programme 1, I rearranged the frames into successive horizontal rows, to be read from left to right and top to bottom (see figs. 41 and 42). This image, which depending on processing power can be produced in different resolutions, is zoomable and allows for viewing the entire film structure as well as to zoom in on specific shots and frames. We found this type of visualisation evocative in that it gives an at-a-glance impression of the colour composition of a

891 For more information on Frederick Brodbeck’s Cinemetrics see: http://cinemetrics.fredericbrodbeck.de/, last accessed January 24, 2017. To explore a possible application of Brodbeck’s software within our project I spent the afternoon of February 19, 2015 at Utrecht University’s Digital Humanities Lab where I, assisted by computer scientist Julian Gonggrijp, ran Brodbeck’s open source code on one of the project's video files. However, this did not produce conclusive results and the additional programming needed to apply it was not feasible within the project’s timeframe.

892 For a step-by-step walkthrough see the Software Studies Initiative’s documentation for the ImagePlot software: https://docs.google.com/document/d/1PuSZnmKwOwSIFrbmVl-evbShTbrfPrtstxNgC3W1oY5C4/edit, last accessed September 24, 2017.
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programme, making it possible to see its shifting colour schemes.

![Figs. 41 and 42 ImageJ Montage visualisations of Desmet programme 1 (left), and a zoom image of the same (right).](image)

In many respects, however, the visualisation also felt counter-intuitive. Because it places different segments on top of each other, it obscures their sequential relations. This is particularly evident when the user zooms in on the visualisation, thus losing sight of the left and right edges of the composite picture. It could perhaps have been more productive to reduce the visualisation further by proceeding as in the Digital Formalism project, where the second frame of each shot was annotated and selected manually to produce a less dense representation of the program’s structure. A full montage visualisation thus turned out to be unfit for an analysis of the colours in a lengthy film programme. The creation of such colour profiles, is useful in particular for the analysis of colour uses as textual conventions within individual films, in a combined distant and close reading. Therefore we felt they did not support our goal to establish colour palettes within the Desmet collection on a larger scale.

It appeared that summary visualisations, while more abstract than montage visualisations and without an indication of the frames’ sequential relation, could be considered more productive when it comes to developing a distant reading-approach to silent cinema’s colours. In the summary visualisations, every image of a sequence is layered onto the next, thus creating a canvas of colours with different qualities throughout the image. The predominance of one hue, saturation or brightness in one area of the frame reflects a persistent occurrence of that hue, saturation or brightness in that particular area of the frame throughout a programme. The image thus allows for understanding the frequency of chromatic events in the frame, along the entire length of a
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programme. In addition, comparison of film programmes is possible, either by scrutinising visualisations to compare programs or with the help of the additional ImagePlot functionality. For instance, it is possible, by creating a scatter plot with all summary images combined, which ImagePlot allows for, or one can arrange them onto a classic Cartesian grid, once again according to the same variables: in terms of hue and saturation, brightness and saturation, or hue and brightness.

Figs. 43 and 44 ImageJ SUM visualisations of Desmet programmes 1 (left) and 3 (right).

In light of the many uncertainties concerning the colour appearance of the digitised films we worked with, we focused in our explorations on broad patterns in film hue. For the full Desmet programmes, we could observe that the summary visualisations create predominantly light-gray/greenish-coloured pictures with some red sections; in programme 3 in particular, a number of blue sections also appear (see figs. 43 and 44). However, such summary visualisations of entire programs do not explain why certain colours appear more frequently than others. In order to investigate that, we would have to return to a closer inspection of the individual films, to be able to consider for instance the films’ individual colour schemes and their distribution history and archival life. Keeping in mind Mazzanti’s remark on colour fading, this seems necessary when considering how a colour’s saturation might change throughout a frame because of for instance its projection history.

Second, then, I created visualisations of each of the films separately. The intention here was to determine whether we would be able to discern also patterns according to genre. This gave interesting results, which did however not allow us to make inferences about general colour patterns. Take for example programme 1’s first item, the non-fiction film Target Practice of Atlantic Fleet US Navy (Edison Manufacturing Company, US 1912), the programme’s shortest film, with a
duration of about 7 minutes. Immediately noticeable in this visualisation (see fig. 45) is the strong imprint of the contours of the intertitles, and the overall brownish tone due to the film’s tinting. Tentatively, one might infer that this points to a prominence of text, associated in turn with the film’s didactic nature. As a less conspicuous film in the programme, its colour scheme appears monochrome.

Figs. 45 and 46 ImageJ summary visualisations of *Target Practice of Atlantic Fleet US Navy* (Edison Manufacturing Company, US 1912; right) and *L'Obsession du souvenir* (Gaumont, France 1913; left).

The visualisation of Léonce Perret's Gaumont-produced drama *L'Obsession du souvenir* (France 1913), featuring the popular actress Suzanne Grandais, in contrast, is the most advanced and spectacular one, at least from the perspective of colour use. The tinted, toned, combined tinted and toned, and stencilled sequences of this film merge into a very colourful picture (see fig. 46). A visual check of both films does indeed reveal a relatively higher ratio of text and a much more consistent use of colour in the first – thus confirming qualitatively the pattern we observed after a series of quantitative operations. If this pattern occurs on a larger scale is something which would require further research to determine, by working with a larger number of films as in for instance Kevin Ferguson’s research. Furthermore, considering that previous scholarship has indicated that the Filmmuseum’s print of *L'Obsession du Souvenir* is incomplete, there still remain fundamental philological aspects to reflect on.\(^{893}\)

Based on our visualisations of films from the Desmet collection, we could conclude that they did not sustain an analytical potential or methodology unambiguously at this point. On a basic level they did illustrate one of the fundamental objectives meaningfully, namely to give users an at-a-

\(^{893}\) Richard Abel, *The Ciné Goes to Town: French Cinema, 1896-1914*. (Berkeley, Los Angeles, London: University of California Press: 1994) 527n88. A search in EYE’s catalogue shows that the film’s initial length at the release was 393 metres while the copies created from the elements preserved at EYE measure 261 metres.
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glance impression of the sorts of colour schemes audiences were exposed to when visiting cinemas showing Desmet-distributed films. In our visualisations of three programmes from the mid-1910s, we combined information on dates, locations and programmed titles (collated in the mapping tool) with visual information, in a way that highlights the pervasiveness of colour in films screened at the time. Looking at these pictures in combination with the map interface, any scholar can conclude, that watching black-and-white images was the exception rather than the norm in the period. In this respect the visualisations do serve an important function. While research efforts of the past two decades have made it abundantly clear, at least to experts, that silent cinema was overwhelmingly coloured, it continues to be difficult to make this more widely palpable. The colour visualisations directly confront viewers with the richness, and range, of colour in films at the time, and appeal to their imagination much more powerfully than mere metadata information does such as the terms ‘colour’ or ‘applied colour’, or even ‘tinting’ or ‘toning’ which appear in the mapping interface.

However, beyond this function, the visualisations' uses within the project could not yet be said to constitute a method which harmonically brings together textual and contextual analysis. To develop an actual method would require further research and experimentation with alternative colour analysis tools in an effort to attain more ambitious goals, and specifically, help address more complex relationships between location, time and the stylistic features of early films taking the cue from the questions raised at the 1995-conference which remain relevant today, and see them in a new light. For instance, by creating summary visualisations of full programmes as well as individual films, analysis of the Desmet collection on two levels may be possible in the future. On the one hand, a comparison of summary images of programmes or films might help film historians to establish how the spectrum of film colours developed in the course of silent cinema’s transitional years. It might enable them to detect changes in periods when attitudes towards colours shifted, and, with the help of additional, contextual sources, understand their relation to concurrent historical events.

The limitation of programme visualisation here is that they combine the widely diverse colour palettes and techniques of several films, resulting in single abstract images that do not necessarily do justice to the specificity of the patterns within individual films. On the other hand, a comparison of visualisations of individual films might also provide new insights into the use of colour in various film genres or production companies, or in specific genres over time.

Both types of envisioned research can be likened to the distant reading propagated, among others, by Moretti. However, in our project we ended up proposing and wishing to develop further a
form of distant reading that, in line with Drucker’s suggestions, emphasises to a greater degree the contingency of our data. For this reason, our project motivates historians to take an exploratory approach to the visualisations and return to the sources – not unlike Digital Formalism’s combination of distant and close readings - to reveal concurrent shifts in production circumstances or audience attitudes armed with new questions inspired by the patterns observed. While our interface allowed for navigating between the map view and the colour visualisations to potentially explore patterns, one area to experiment further with remains how we might productively integrate the two to a greater degree, to facilitate combined analysis of larger corpora of films covering larger time spans. To conclude, while the project’s effort to combine contextual and textual analysis yet remains to be further realised we did achieve interesting conclusions along the way. For instance, with the mapping tool we discerned bias in our data which pointed to its limitations for understanding film distribution and exhibition in the Netherlands. Furthermore, it opened an avenue for studying colour patterns in genres using ImageJ.

4.4 Conclusion: A Cartographic Dispositif

To conclusively recap some of the points discussed in the chapter's first parts on new cinema history’s relationship with Annales historiography, the cartographic dispositif of digital film historiography can be considered less new than the philological discussed in the previous chapter. As I have argued, drawing and extending on Maltby's discussion, its cartographic approaches remain firmly embedded within primarily Annales' tradition of socio-economic history, developing in a pas de deux with its quantitative, serial techniques of data analysis and cartographic representational practices. It has evolved by engaging with debates on GIS’ epistemology emerging in the early 1990s to position itself as a reflexive, scholarly practice today. However, the field does not speak unanimously. A scholar such as Ian Christie has argued that the new wave of local cinema history research instantiates a new scientific empiricism. On the other hand, judging from Klenotic’s, Verhoeven’s and Allen’s stances, there appears to be a clear and increasing tendency to conceptualise GIS visualisations in New Cinema History within constructionist and reflexive theoretical frameworks. Consequently, one may argue that New Cinema History's engagement with Annales’ geo-history infuses it with an ambiguous attitude towards scientific research practice which uses cartographic representation in an empiricist fashion while highlighting it as a contingent, reflexive practice. Furthermore, judging from the examples discussed in this chapter it also changes,
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with the exception of *Early Cinema in Scotland*, the focus primarily to film-related sources held in a broader range of institutions beyond only the established film heritage institutions. With the case study of the *Data-driven Film History*-project I drew on my involvement with the GIS-based project on EYE's Desmet collection from the perspective of a builder, in Ramsay’s terms, to analyse the development of a format in line with New Cinema History's analytical and representational practices. At the same time, the project tried to hint at strategies for breaking down contemporary divisions between textual and contextual research in order to reintroduce New Film History's analytical focus on film's performative dimensions and, perhaps in the long run, also its notions of print criticism. In this respect it possibly showed a path for New Cinema History researchers to engage with digitised film archival collections to a greater degree, beyond a primary focus on film-related sources. This resulted in a visualisation which in many respects reflected New Cinema History’s contemporary practices and methods of visualising films' spatial series and its ambition to display data ambiguity and transparency. However, to a greater degree than other New Cinema History projects, our visualisation highlighted the heterogeneous provenances of its sources and their archival life, thereby indicating the kinds of analysis the datasets could yield individually. Further research will show whether this may provide new methods to build upon within the field, just as the relations between screening venue and film text need further exploration in a combined format.

As in Chapter Three I would like to conclude by providing an overview of the assumptions, methodological steps and features which qualify New Cinema History’s cartographic dispositif. In this overview I have left out the *Data-driven Film History*-project’s component of textual analysis, which I consider to be covered in Chapter Three and, with regard to its integration into New Cinema History, as being in an experimental phase.

First of all, the underlying historiographical assumption of the cartographic dispositif is that cinema should be studied as a leisure activity of consumption which reflects a mentality, in the sense defined by *Annales* historiography, which is manifest in geographically specific exhibition venues and routines embedded in larger socio-economic networks. Following this conception, scholars study primarily film-related, contextual sources, found in either film heritage institutions or regional archives, or, as Dibbets advocates, sources from several collections and collection types. The dispositif’s data collection and analysis tend to be practiced within groups, rather than by lone users, in collaborative efforts where technical and interpretative tasks are more clearly divided and hierarchised. Data collection and database organisation activities such as transcription, digitisation
and coding follow taxonomies prepared by historians, possibly, as in the case of Cinema Context’s development, with help from research assistants.

<table>
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<tr>
<th>The Cartographic Dispositif</th>
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<tbody>
<tr>
<td>1. Definition of film artifact</td>
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<tr>
<td>2. Source material/Metadata</td>
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<tr>
<td>3. Provenance</td>
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<tr>
<td>4. Technique</td>
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<tr>
<td>5. Taxonomy of features</td>
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<tr>
<td>6. Textual level</td>
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<td>7. Visualisation</td>
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<tr>
<td>8. Format</td>
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<td>9. Regime of navigation</td>
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*Fig. 47 Features of the cartographic dispositif*

Building on the developments from Cliometrics’ coding of punch cards to distant reading’s topic modelling, the sources are analysed with statistical calculations on data structured with numbers or quantitative techniques of text mining to discern patterns in word frequency, locations and names. The patterns in consumption, distribution and exhibition which emerge from such analyses are subsequently plotted onto maps and considered as reflecting spectatorial attitudes, industrial patterns and societal tendencies. The maps’ visual arrangement allow for contemplating primarily film distribution and exhibition’s spatio-temporal series in relation to demographic data. It produces a multi-scopic visibility of networks with a greater density than written texts, with which scholars, in a non-linear fashion, can contemplate macroscopic patterns of distribution and exhibition infrastructures, in combination with the microscopic patterns of individual venues’ programming and anecdotal accounts. The dispositif’s temporal anchorage is variable, ranging from the overtly presentist GIS views to more complex depictions of temporality through historical map overlays or key dates approaches. The table above provides an overview of this dispositif’s features as I have described them here (see fig. 47).

Again, as in the previous chapter, I also wish to consider the first three levels of Albera’s and Tortajada’s descriptive categories of human-machinery interrelations. To again remind the reader, these are: 1. The relation between the spectators and the machinery; 2. The relation between, on the
one hand, the spectators and, on the other, the machinery and the representation; and 3., The relation between the spectators and the representation.

With regard to the first type of interrelation, it is interesting to point out that the analysis and contemplation of a GIS-based map representation of data is performed primarily with a desktop computer in either private or institutional settings. This reflects the practices and procedures of historical computing, in particular those of second wave historical computing, which flourished in the slipstream of personal computing’s emergence. Concerning the second type of interrelation, these procedures have in recent years reflected an increased ambition to embrace open-ended, exploratory research procedures and alternative interactions with machinery and representation, placing greater emphasis on methodological pluralism and polysemy. The cartographic dispositif encourages users to intervene and produce alternative representations of the underlying data, by adding more data or by using different analytical practices of alternative machineries. As a consequence, on the third level, the cartographic dispositif does not suggest to its users a fixed approximation between object of analysis and representation, as methods with more rigorous scientific aspirations would proffer, but highlights ambiguity. Also when relying on Google Maps or license-free historical maps, scholars seek to achieve a great degree of openness through interface design, such as colour coding for instance, or by making data openly available to invite different interpretations.

In addition to qualifying the cartographic dispositif, I would also like to add a concluding observation and suggestion for further development of its historiography. While New Cinema History’s cartographic dispositif is highly advanced and arguably more institutionalised than the philological, one may raise the point that its current practice could fruitfully reflect the conceptual underpinnings of Annales historiography to a greater degree. In particular, one could make the case, that its representation of temporality does not fully reflect the longue durée of Annales’ serial history which one could suggest might be productively explored further within especially early cinema studies. Ladurie’s studies of for instance price and rent developments covered a temporal span of several centuries. New cinema historians tend to focus primarily on periods of roughly 30-35 years or less. In this respect, though inspired by Annales' serial history, it does not seem to fully engage with the conceptual implications of its historical model which, as Chaunu explained it, regarded histories with a time-span of 30-35 years as belonging to conventional economic history without a focus on the slow changes of societal structures.

New cinema historians might consider revisiting classic texts on cinema's emergence to develop
GIS-based longue durée representations of cinema’s emergence spanning several centuries. A great variety of film histories, since the very beginnings of film history writing, depict cinema’s emergence by focusing on the history of the optical devices that preceded it. The title of Henri Langlois’ essay collection “Trois cent ans de cinéma” and commitment to collecting optical devices from before cinema’s emergence suggest this. Furthermore, 1970s' Apparatus theory and later early cinema studies focused in even greater detail on the deep histories of technological developments and their interrelations to cinema’s formal conventions and exhibition. Laurent Mannoni’s landmark study The Great Art of Light and Shadow – Archaeology of the Cinema (first published in French as Le Grand art de la lumière et de l’ombre: archéologie du cinéma, Nathan Université 1999) made it strikingly clear how cinematic conventions were conditioned by popular and scientific projection situations prior to cinema’s emergence. In this regard, one may suggest that while New Cinema History has fully integrated serial history's coding practices to develop macroperspectives, it has not yet truly established longue durée perspectives. Along those lines, one might imagine a research path for new data collection and organisation to produce cartographic representations of how preceding screen practices in rural areas and fairgrounds compare to cinema’s infrastructures at later stages. This could, I believe, yield interesting perspectives on the long and slow developments of screen history within New Cinema History’s conceptual lineage and practice.

Beyond this, new cinema historians have also recently begun experimenting with tools from digital archaeology to produce for instance 3D visualisations of historical cinema interiors. This was the case in Julia Noordegraaf, Loes Oppenhaffen and Norbert Bakker's recent reconstruction of the 1910s interior of Jean Desmet’s Parisien theatre prior to its make-over in 1924. This reflects new methodological developments which New Cinema History has not yet considered broadly and which might produce new research directions. In this respect, there remains several new methodological paths to be opened, which requires that researchers take new steps in terms of collecting, processing and digitising data and engage with the representation of longer time series with GIS as well as consider a broader variety of representational formats, than has hitherto been the case.

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