Early Cinema and the Technological Imaginary
Punt, M.J.

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CHAPTER 3:
New Film History and the Complexity of the Data

Overview
As was evident in the last chapter, Thomas Edison, the Lumière brothers and Robert Paul were driven by a combination of individual and shared forces. They each came from quite different scientific and technological backgrounds and, between them, they made crucial contributions to cinema technology. In many instances, they collaborated — perhaps unknowingly— by either copying from one another, and other inventors, or duplicating technical solutions to achieve what was already in the public domain. The claims and counter claims for priority of invention are of secondary importance and dissolve as the complexity of the processes of invention become apparent. A number of recent studies of the institutions of science and technology and the cognitive processes of invention make it clear that the myth of the individual genius is seldom supported by empirical evidence. Of more significance, perhaps, is the fact that through this process of inevitable collaboration a dispersed community of inventors from different backgrounds arrived at certain norms and industrial standards, sometimes through shared technologies or, at other times, through the contingencies of the commercial organisation of the industry. Within their means as inventors and businessmen, they had to arrive at some sort of a consensus over what the cinema experience was, and what this experience referred to in the daily lives of those who engaged with it in order to both satisfy and cultivate the appetites and experience of the public.

Many of the determining factors identified in the preceding chapter point to the effects of what might be classed as a negative dynamics. Without Edison’s failure to secure European rights for the Kinetoscope, for example, Robert Paul may have not engaged with cinema at all or have brought his instrument maker’s sensibility and business mind to bear on film form. Similarly, without the pressure of competition from Edison, the Lumières may have extended their period of experimentation to achieve satisfactory perfection. One outcome of this may have been to focus more on the stereoscopic implications of moving images or on the marketing of the Cinématographe as an amateur apparatus. Had either of these things happened, it is perfectly possible that Thomas Edison may have been in a position to resist the demands of his Kinetoscope agents to support the Armat projector. His original idea for a domestic recording machine for the eye — a sort of VCR — may have been reached much earlier in the century. This line of development may be speculative but what it does illustrate is that, in the process of inventing, the role of accident and coincidence plays a large part in how one machine rather than another is invented, and these factors need to be acknowledged in any history of the cinema. In the case of the interpretation of the cinema and the development of film form, what is apparent from the detailed examination of these three figures, and of their engagement with early cinema forms, is that each had a different conception of what the machine might mean for the general public. As far as possible, they developed it in the direction that they thought most satisfied their own itinerary of personal and economic interests. If the dynamics between them had been slightly different in this complex matrix of determinants, quite possibly another kind of cinema would have been
invented. Consequently, as is widely accepted elsewhere, a study of an individual cannot explain either how something was invented or why it was used in a particular way.

The response of "new film history" to these questions has been to provide a less positivistic explanation of the invention of cinema without consigning the processes to haphazard historical accident — the presence of one genius or another at the right time. The start of this project has often been attributed to the FIAFF conference in Brighton in 1978 when a wealth of forgotten material was screened. On this occasion it became undeniable that the process by which the technology of moving images became institutionalised as cinema was not one of an inevitable progress towards a sophistication of film form, but a more complex intersection of divergent ambitions and interpretations of film as a public entertainment. In a survey of histories of early cinema, other figures' contribution to the interpretative process range from the shadowy to the highly visible. They include not only Muybridge, Marey and Demeny, and others from the field of science, but also quasi-technologists like Jenkins and Armat, and the Lathams, who elegantly resolved the problems of the intermittent transport of the film through the projector by introducing a loop above and below the gate. As a consequence of the divergent and often contradictory attitudes of Edison, the Lumières and Paul, it is apparent from looking at the work of "secondary" figures, producers and exhibitors that there was a brief intellectual space for radical intervention. In this period when there was a developing idea of what the technology meant, individuals with perhaps a greater understanding of the viewers, were able to experiment with the technology to develop forms and content that continued to draw an audience long after the technological spectacle had lost its novelty. More particularly, a quite remarkable parade of entertainers and innovators envisioned possibilities for cinema technology which they turned into real and quite distinct experiences for audiences. These responses came from the ranks of popular entertainers including lanternists, fairground showmen, phonograph agents, conjurors, illusionists, performers, persuaders and scientific demonstrators who, while technically competent, were committed to audiences rather than to the new machines.

Many film historians have begun to examine more thoroughly the conditions of production and exhibition alongside those individual producers and exhibitors who contributed to the interpretation of the cinematograph in ways that more closely matched public expectations. In some, an entertainment history has overlaid the technological developments to show how a spectacle of temporary attraction developed into a more enduring source of popular pleasure. Charles Musser, for example, has argued that the transition from the single-shot, non-narrative films which the inventors produced, to a more complex film form, was brought about by the intervention of exhibitors who called upon a history of screen practices to excite audiences. Musser insists that:

Motion-picture practices did not evolve as they did because of the extraordinary genius of a few individuals but because significant numbers of people recognised new commercial and artistic opportunities implicit in previous change and so, in turn, further altered the practice of cinema.\footnote{14}
Turning his attention to the period up to 1907, and with his specific interest in the United States, Musser shows how an established spectrum of screen entertainments were altered to make the most of the new machines that came on the market.115

Three major personalities, from among a host of others, stand out as significant early re-interpreters of the inventors’ intentions. Georges Méliès, Cecil Hepworth and Edwin Porter are notable for coming from diverse backgrounds and, in this early phase of the industry, they acquired some international reputation on the basis of films they made that touched audiences. Méliès, Hepworth and Porter came from theatrical, lanternist and scientific backgrounds respectively, and their significance is in their re-interpretation of the various machines and exhibition ensembles independently of the inventors. Each in their own, different intervention, developed practices and conventions to refigure the use of cinema in ways that the technological developers were unable to foresee. What they share with the technical inventors is a parallel pattern of complexity in the imperatives that drove them.

Revisiting Méliès and the fantastic film
The extraordinary success of Georges Méliès as a filmmaker was due to the opportunity he had to realise his ideas as a producer and exhibitor, and his unique conception of what the Cinématographe might do for the variety theatre. Méliès’ attraction to the cinema as a machine for the expression of the fantastic was immediate. The Lumières knew him and rented premises above his theatre, and, as a prominent theatre owner, he was an invited guest at the first Cinématographe demonstration in December 1895. It is suggested that, immediately after the performance, Méliès approached the Lumières and attempted to buy a Cinématographe to produce magical effects for his conjuring show at the Theatre Robert Houdin. The Lumières refused to sell, preferring initially to perfect the machine and fully exploit its novelty value themselves to maximise profits. However, such was the urgency of his commitment that, on the advice of his mistress, who saw one of the first presentations by R W Paul, Méliès purchased a Theatrograph and some films and stock, and by the beginning of April 1896 was showing films at his theatre.116 On the basis of these parts of the machine ensemble, he constructed his own camera with the aid of Luciène Korsten and Luciene Reulos, and started to make films a month later in May 1896. His idea for film was quite different to that of the Lumières who were producing actualities and short dramas. Méliès believed that audiences would also respond to artificial and fantastic views, provided they were structured within the familiar context of the theatre. Within four months he began work building a studio at Montreuil for the sole purpose of making films which could be integrated into his shows. These were more-or-less narrativised conjuring tricks.

Méliès integrates photography and theatre
Méliès also re-interpreted Robert Paul’s vision of cinema and described this earliest work with moving pictures as “a reunion between the photographic studio and the theatre”.117 This interpretation was not unique. It was shared by some of his close associates, including Felicien Trewey who demonstrated the Cinématographe in the Regent Hall and David Devant who purchased the first Theatrograph; also as conjurors they were attracted to
moving pictures. Devant and Joseph Buatier de Kolta greatly influenced Méliès’ stage performance, and Devant came to work with him at Montreuil. Initially, Méliès simply replicated much of the standard Lumière programme of “senics” and panoramas. However, as building work developed, he continued to supervise production, and the plan for the studio was modified as new possibilities for film-making occurred to him. By 1897 his catalogue had changed remarkably, showing mainly made-up stories and only a few “senics”. Montreuil, unlike Robert Paul’s studio which was designed to make a specific kind of product on the laboratory model, grew organically in response to a more complex understanding of the public demands of film as a theatrical entertainment. This approach to film-making and its audience was sufficiently successful that, by 1897, the Theatre Robert Houdin was committed totally to presentations of films in the evening performances.

Whereas Robert Paul used film to capture existing stage acts and popular state and sporting attractions in much the same way as Edison did, Méliès realised quite quickly that it offered new, and hitherto unprecedented, opportunities for novel visual sensations. Describing one of the two surviving films from 1897, John Frazer notes that *The Vanishing Lady*, made towards the end of the summer, is based on a familiar stage act transferred to film. It shows a woman, sitting on a chair, who is covered with a cloth and then when the cloth is removed is revealed to have disappeared. However, even though it would have been a simple matter to film an actual performance of the trick using traps, none are used in this film. Instead, Méliès experimented with stop-substitution.118 This was not an accidental or “first use” of the technique since, as Frazer points out, the Kinetoscope film made at West Orange in 1895, *The Execution of Mary Queen of Scots*, uses precisely this technique to provide the illusion in the beheading scene. Méliès’ use of stop-substitution rather than traps in *The Vanishing Lady* reflects not the serendipity of a playful performer unable to operate the camera properly as the myth suggests, but a distinct conception of “a reunion between the photographic studio and the theatre”.119 Méliès’ films are pleasurable satires on the real world and, in the Cinématographe, he found the perfect handmaiden to theatrical conjuring in his challenge to scientific rationalism. His films savagely critique the pervading rationalism of science (the putative origin of the Cinématographe) by showing that photography, as the accepted purveyor of truth, is based on an unreliable contract with the real.

This conception of the cinema shaped Méliès’ use of film for over two decades until he ceased production in 1912. His catalogues consistently comprise trick films, with the occasional scenic or topical. In his penultimate film, the last extant, Méliès still depicts a syncretic fairy-tale world in which tricks and illusions take place. Frazer comments that in this year French cinema comprised elaborate spectacles and epics and, “between these pompous new style melodramas in their elaborate three-dimensional settings and Méliès’ fragile Belle Epoque amusements, there was a wide gulf”.120 His films were enormously popular with audiences and it appears from the catalogues that, almost from first to last, they represented a critical subversion of the norms of daily life.

Méliès’ use of film as a subversive medium was apparently attractive to an international audience for over two decades. Initially, American exhibitors copied his films and, to
prevent further losses, he opened an office in the United States, with his brother Gaston heading the operation during the years 1903-4. Star Films were considered a great asset to the content of the programmes since American films tended to be rather weak on ideas. The appeal of Méliès’ films was sufficiently widespread that he instigated a process of production at his Montreuil studio to produce an additional negative to be exported to make prints overseas for the American market. Méliès could claim that for the first years of the 20th century he was the world’s leading film producer. His was an interpretation of moving picture technology which contrasted with the Lumières’ sober “views” and actualities, and the pedestrian turns and sporting events of the Edison Company. Although he made no major contribution to the technological development of the apparatus in concrete terms, Méliès saw in it a set of meanings that the various inventors had either not considered or, as scientists and technologists, were intellectually able to fully explore. Only Paul, perhaps, as the inventor closest to the public, was able to go some way in this direction and produce films of comparable popularity.

A different approach from non-theatrical developers: Hepworth

Other non-scientists who were not primarily from a theatrical background also used moving image machines in the formative stages of the industry. These included business people such as Charles Urban, the agent for the Kinetoscope in Britain who set up the Warwick Trading Company, and a group who came from a photographic background comprising A Esmé Collings, Albert Smith, James Williamson and Alfred Darling, located at Brighton. Some had a mixture of interests, such as Cecil Hepworth – a lanternist interested in photography, Birt Acres – a photographer producing serial images as postcards, and Walter Hagger who was from a travelling show family and became an innovative filmmaker. Of these, Hepworth was particularly successful and enduring. He was producing about 100 films a year around the turn of the century. Moreover, unlike many of the so-called pioneers, he remained as a film-maker until bankruptcy struck in the early 1920s. However, he continued working in the industry producing feature film trailers until the 1940s, when he retired from a career which had covered photography, the lanternist’s art and mainstream movies. Under the influence of this group who interpreted the technology, gathering an audience and engaging it in a narrative became a more important issue for cinema than illusion or technological spectacle.

Cecil Hepworth initially regarded moving pictures as an inevitable commercial extension of the professional lanternist’s business that could attract audiences in its own right. In response to his success with this approach, and what he anticipated as the emerging demand of showmen and fairground operators, Hepworth abandoned the magic lantern and committed himself to film production. He invested in a glass-roofed studio a year after Paul’s open-air stage was built and, in anticipation of the international appeal of his products, he is reputed to be one of the first British producers to have an American agent. Hepworth’s career in the entertainment industry is marked by his intelligent responses to the perceived appetites among his clients — whether they were fellow exhibitors or audiences — and a mastery of the technical problems of presentation. He established an advanced, vertically-integrated “cottage industry” as a production method at Walton-on-Thames, in
which collaboration and team work also included a system of designated responsibility. In his recollections, and those of his associates, he seems to have approached the whole project of the moving pictures in quite a different way to other pioneers, but in many ways he can be seen as “inventing” the cinema that we know today.

Itinerant lanternists, such as Hepworth, at first introduced moving films into their programmes as a merely technical novelty, but they quickly moved on to use them to add variety to their storytelling. This was an intuitive use of the medium, based on long experience of public presentations. Hepworth, whose father, T C Hepworth, was also a lanternist, recalls in his autobiography how Alfred Moul, the impresario at the Alhambra, saw a demonstration of his idea to integrate film in a four-lens, multiple-slide projector. The device fused film with dissolving views simultaneously to create a spectacular effect. He recalls that Moul wasn’t very much impressed. He said it was always the subject, not the presentation, that mattered. Subject, subject, he kept on saying. And he was dead right. The only thing that really matters is the subject; that is the story: it has been dead right ever since. If the story doesn’t ring true, neither artists nor scenery nor colour — nothing can save it.122

Hepworth brought the experience of the lanternist tradition, together with his photographer’s background, technologist’s dexterity and force of personality, bear on making moving-picture shows that were attractive to non-technical audiences.123 Where Méliès saw film as a reunion between the photographic studio and the theatre, Hepworth, and other lanternists, understood film as a convergence of photography, the magic lantern and spoken narrative. Progressively, as audiences and film-makers came to understand moving-picture technology as a story-telling medium, the slide element of the show was reduced. Even so, it took Cecil Hepworth several years to see the real importance of moving pictures in the context of the lanternist’s art despite of being present at Robert Paul’s screening at Olympia.124 He was impressed by the spectacle but his immediate response was as a hardware manufacturer, and he offered to sell Robert Paul a new design of arc lamp. Paul took up the offer and subsequently the two of them became friends and collaborators and, in the following years, both made films and designed hardware modifications. Early in 1897 Hepworth took a shop in Cecil Court, an area that was beginning to be established as the centre of film distribution in Britain. He bought scrap films from Paul and in his words:

The next step was inevitable. I had some hundreds of lantern slides from my own negatives accumulated over several years. What more natural than that they should be grouped into a few short series having “story content”, be fertilised by suitable films from said [Paul’s] junk basket, built up with lecture and music and taken all over the country to halls where many in the audience had never seen a living photograph in their lives before.125

Hepworth learned from the first entrepreneurs about the commercial potential of the business and between 1898 and 1899 he worked, possibly as a producer, for Charles Urban,
a dynamic player in the moving picture world. Having begun as an agent for Maguire and Baucus, he re-named the firm The Warwick Trading Company around 1898. This company was notable for their extensive catalogue, including French and American imports, and for the unusual length of some of their film — some as much as eight times the standard. According to Rachel Low, Urban’s intention was to transform it into an English company and he entered production.126 Warwick Trading, under Urban, provided films which satisfied a broad spectrum of the market. These included tricks, actualities, advertisements and footage from the Boer War. He was interested in Hepworth on account of his mechanism for a projector, but quickly involved him in film-making. In his brief period with Charles Urban, Hepworth learned about the film business as an international concern and, in 1899, he moved from exhibition to production and formed his own production company.

The Hepworth Manufacturing Company concentrated chiefly on comedy and trick films. With one exception — a drama called The Burning Stable in which a man rescues a horse — optical tricks, gag and “bad-boy” films dominated his output. Some featured explosions of one kind or another using dummies and stop-motion, while others relied on switches between sets to give the appearance of reverse gravity. From 1901 until the end of 1902 a small number of trick films and comedies were produced, as well as one serious film per year. In mid-1903 he produced Alice in Wonderland — an 800 foot serial — along with a number of short tricks, but increasingly these relied on established music hall numbers, more like Paul’s continuing output, and less on the performative aspects of the cinema as a clever machine that could reverse time and gravity. By 1904 Hepworth’s films were nearly all fully-rounded dramatisations of events, whether as comedies, or crime stories or romances.

Hepworth was as eclectic as ever and, by the time he embarked on his independent filmmaking career, there were over 20 identifiable companies producing films.127 Film production attracted speculators from a variety of fields although, after the first flush of invention, it was mainly entertainers such as laternists and conjurors who also had some idea about photography. As Rachel Low points out, however, anything to do with films and filmmaking at the turn of the century inevitably involved technical skills and invention. Machines, however, were difficult to come by for a variety of reasons:

Being the type of men they were, they proceeded to make their own — not only their own films, but in many cases their own apparatus as well. Small companies sprang up all over the country in the last four years of the 19th century — in Yorkshire, Lancashire, Sheffield, London and Brighton. Almost every firm was dominated by one man, who devised his own equipment and methods; wrote, produced, and as often as not acted (with members of his family) in his own films; and marketed and sometimes exhibited them himself. In most cases he also sold cinematograph equipment, as well as taking films to customer’s orders, and carrying on an extensive export business.128

Cecil Hepworth was typical of this kind of man. He was technically competent, and his early
career as a lanternist made him sensitive to the public’s expectations of a film show. To begin with, he understood the cinematograph as a technical intervention in the lanternist’s portfolio. He displayed the machine as both a technological wonder and also as an adjunct to traditional narrative forms. While Robert Paul was using the cinematograph to recreate stage acts, and Méliès and Devant et al were integrating the apparatus with their acts as illusionists, Hepworth saw the machine as another asset to add to a career built upon the personal performance of stories. He quickly learnt from his time with Urban that there were many, often quite disparate, appetites for film, and followed the general trend towards a more “serious” use of the machine. At his own company, Hepwix, he began to produce dramatic stories with more complex content in response to the demands of exhibitors, and he became a significant producer for the first decade of the history of cinema. Although he came from a different tradition to Robert Paul, both were in close touch with their clients and recognised that the audience demanded something more from moving pictures than a wondrous machine to passively observe.

Thomas Edison devolves interest in film production to others: Porter
The changes which followed the different sorts of interests in the field of moving images forced Thomas Edison to rationalise his own involvement. His background as an inventor did not equip him to fully understand the determining power of the audience. As early as 1892 Thomas Edison devolved the economic exploitation of the Kinetoscope to others. Alfred O Tate was charged with the arrangements for the World’s Columbian Exposition in Chicago. Later, with the formation of the Edison Manufacturing Company, Tate was replaced by William E Gilmore. Charles Musser’s business history of this company reveals that, as the various consortia were formed and arrangements were entered into, Thomas Edison became a marginal creative influence who was more concerned to use the value of his name as an asset in launching this product. The films were mainly produced by James White until 1900, and later by William Heise, although Dickson, and later others, are also credited as makers. This arrangement began to fail in the 1900s when Edison’s reliance on license fees left him financially vulnerable in the face of litigation. As a response, the Edison Manufacturing Company was reorganised and James White appointed Edwin S Porter to make a number of technical improvements. Although there were a number of other licensed American producers, the restructured Edison Company became the most important source of new subjects in the United States. What was crucial for the development of film form in this shift was that

...film-making personnel assumed unprecedented (by American standards) control over motion-picture storytelling, and as a result, the production company, rather than the exhibitor, began to create the program. Edison’s filmmakers, along with those in other countries, began to elaborate a system of representation, of spatial and temporal relations between shots... The collaborative team undertaking this important shift consisted of George S Flemming and Edwin S Porter.

Flemming took charge of the studio while Porter became a cameraman and this
acknowledgement of an international effort to re-interpret the cinema based on film’s legibility, forced upon the Edison Manufacturing Company by economic pressure, had the effect of further distancing Edison from filmmaking.

Although thoroughly American, Edwin Porter was typical of the kind of person Rachel Low suggests was at the heart of every film company in Britain. He was a telegraph operator who saw opportunities in motion pictures and became first a projectionist presenting programmes at the Eden Musée New York, then subsequently worked as a technical assistant for Edison. Although he was initially a cameraman in the reformed company, Porter quickly became instrumental in extending the range of story telling to multi-shot films. He was able to do this in part due to his close contact with the audience. As Musser points out:

[Porter] quickly emerged as its key contributor: his expertise as an electrician and mechanic help (sic) to maintain the studio in operating order, and at the same time, his work as a motion picture operator made him familiar with the kinds of films that pleased audiences.133

Among the films that Porter made during this period was that of a visit to the Pan-American Exposition at Buffalo where President McKinley was assassinated. Although this event was not captured on film, a series of shorts were made which showed various aspects of his visit and the aftermath. Porter later re-staged the execution of McKinley’s assassin, Leon Czolgosz. This film characteristically combined location shots with a recreation of the electrocution in such a way as to make a sophisticated political point about the aspirations McKinley had for American foreign policy. The shots of Auburn Prison, for example are not merely “senics” but show the fusion of commerce and technology which was leading the United States’ economic growth.134 This combination of story and actuality into a coherent high-class product became a typical stylistic device that Porter used in an attempt to recover producer control in an industry that was falling into disrepute because of the prevalence of poor copies and dubious exhibition conditions.

During the temporary closure of the Edison studios in 1902-3, a certain reorganisation took place which gave Porter more control. His collaborative methods included the re-working of successful imports, including Georges Méliès’ productions. However, far from merely imitating, he added to the multi-shot film a narrative order which, while not always sequential, was structured according to a logic audiences could understand. This was partly achieved by presenting a world view based on the everyday experience of the viewers. Often, as in The Life of an American Fireman and The Great Train Robbery, a documentary feel was conveyed by the use of an editing style that helped the film unfold as both a reality and a fiction. Porter’s long, multi-shot films recovered some producer control for the industry since editing was no longer an option for the exhibitor and, to achieve this, he intelligently synthesised many of the formal devices of British films and situated them in a locally intelligible context. His special contribution was to develop convincing formal strategies to describe events that were simultaneous or not consecutive. Studio shots were intercut with location shooting, and the mixed genres of the chase film, the story film and the actuality came together in successful productions, none more so that The Great Train
Robbery. Although the story for this film and aspects of its staging were not original, the specific cinematic treatment set a new standard for retelling a complex sequence of events in a sustained and legible narrative.

Porter set the agenda for the formal problems of realism and naturalism that filmmakers had to address if they were to produce the longer and more complex films a producer-led industry required. His gift was to reconcile the ambitions of film producers with the desires and appetites that exhibitors were daily experiencing. The vulnerability of the company enabled him to demand a high level of creative autonomy. Freed somewhat from Edison's influence at the moment when the exhibition side of the business was in transition he was able to embark on an extensive series of films which could begin to attract a "high class" audience and ensure a long-term future for the cinema.

The problematic of accounts of early producers

The undeniable gap in early histories of the beginning of cinema, between the machines that were developed by Edison and the Lumières and their use as entertainment, was often bridged by these so-called primitives. In this history, the alternative interpretations of the cinema by Méliès and others has become subordinated to a teleology inflected by the idiosyncratic artist. In the case of Georges Méliès in particular, his significance was lost — only to be rediscovered by the artistic avant-garde in the late 1920s. The infectious energy of his films and this romantic myth has misrepresented Méliès as a gifted enthusiast, a pioneer and outsider, rather than the successful producer he clearly was. The track record of his company shows that he was businessman who offered the Lumières a significantly different understanding of the technology they had invented and a welcome critique of scientific rationalism. As the contributions of entertainers such as Méliès to the history of the cinema are reassessed, the discrepancies between their understanding of the possibilities of the medium and those of the inventors undermine the teleological histories of early cinema. Increasingly, a history of early cinema producers who were responding to audiences, often occupying the same physical space, poses a complex and irreducible fragmentation where technological determinism insists on unity of an invention which made pictures move. As more evidence of this period is uncovered, increasingly the primary task in the understanding of the origins of cinema and film form becomes one of explaining the network of factors that contributed to its emergence at the close of the 19th century.

Self evidently, during the first decade of cinema, the cinematograph had a series of simultaneous and multiple identities. It was not one thing, any more than it is today. It satisfied a number of quite discrete requirements that were both parallel and consecutive. It was both a technological spectacle, offering many kinds of pleasures, and a visible example of the achievements of science whose meta-purpose was progress. The performative aspects of the machine ensemble that accompanied its demonstration as a technological wonder, initially provided a mainstay of film content. These were chiefly actualities, travelogues, process films (showing how industry turned raw materials into products), exotic views, phantom rides, and some story and gag films, often based on news events or well-known tales. But the inventors and exhibitors also attempted to develop new kinds of products to
satisfy the more sophisticated demands they perceived in their audiences. A new influx of intelligence followed the exhibition by the inventors in an almost instantaneous second wave of producers such as Porter, Méliès and Hepworth who responded to these demands with different solutions. For Porter, the story-telling possibilities of the cinema, which he understood from looking at imports and some American productions, turned the machine into a technology for distributing a cultural product ranging from burlesque and vaudeville to high-class dramas, passion plays and opera. He developed a style of multi-shot narratives that suited the vaudeville exhibition context in the United States. He matched the demands of the impresarios with a product that met the desire of audiences for stories by developing complete shows or turns that did not require an entertainment context to make them intelligible. Georges Méliès’ first films, on the other hand, were intelligible only as a theatrical effect as part of a magic show. His use of the Cinématographe was as a conjuring apparatus that could make miracles happen and inscribe its own clever effects onto a filmed story. Such a double move told stories and showed the world in ways that were not so much understood through myth and daily experience as through the irrational but compelling logic of dreams. Cecil Hepworth, in a very British, self-effacing way, integrated the apparatus within the performative practices of lanternists and the discursive practices of the technologists. His was a much more intimate and domestic cinema which gently reiterated recognition of a culturally-sanctioned world.

These three were not the only people re-interpreting the cinematograph relative to specific conditions of exhibition and audiences. As with the invention of the necessary machines to reproduce moving images, there were many simultaneous and parallel experiments and interpretations, particularly in Britain, where the constraints of patent litigation were less. The historiography of early cinema since 1978 has revealed the diversity of the approaches to re-inventing the cinema, and the sophistication of some of the solutions in brilliantly structured films. Exhibitors and producers also imitated each other’s successes, a problem for the historian when the original has been lost. Ferdinand Zecca, for example, working as Charles Pathé’s producer, became a brilliant plagiarist able to move between styles and genres with such facility as to produce films that were indistinguishable from the originals in their use of cinema. In Britain, G A Smith, James Williamson and Charles Urban were also actively experimenting with different kinds of film products to build audiences and sustain the unexpected appetites which the first showings of the apparatus had revealed.

Conclusions

Research into early film history is revealing a complex network of interaction between the social, economic and technological determinants of film production and exhibition. In the process, new figures and, sometimes, new readings of films have been proposed that need to be integrated with the master narrative of cinema’s beginnings. Moreover, the diversity of interpretations and uses of the cinematic apparatus that have emerged through revisionist histories challenging previous data, have destabilised the assumptions necessary to begin the history of cinema in or around 1895. As Rossell’s extensive and, inevitably, incomplete chronology shows, the efforts to make photographic images move seem to have been going on wherever one looks for a long time. His chronology makes clear that chronological
accounts by themselves yield ever-greater fragmentation in the narrative.

As the historical methodology has become more complex, and the data to be accounted for has grown, accepted accounts of the beginning of cinema have appeared more uncertain. Important as these transitional interventions are, they present the film historian with a certain discontinuity. Rossell's *Chronology*, and John Barnes' and Charles Musser's work have also closed off a number of options, not least the most enduring ones of histories of "great men" and "firsts" which now appear to be no more than tautologies. Only as the specific definition of the first machine is determined by a post-hoc definition of cinema is it possible to find an inventor. Alternatively, a genealogy of the cultural imperative for the moving image also becomes an infinitely regressive history of everything. The extensive chronologies of cinema by Charles Musser, John Barnes and Deac Rossell, covering as they do production, distribution and exhibition, paradoxically tell more about the context of production and reception and less about how the cinema was invented. They answer many of the outstanding questions for the film historian, as they simultaneously reinforce the idea that it is no longer adequate to rely on individual interpretations or discrete events to explain the emergence of cinema. Rossell hopes to revive "... some sense of the chaos and energy of the period" with his *Chronology of Cinema 1889-1896*, and, indeed, he tells us much about what it was like to be a scientist at the time, what it was like to go to the theatre, and to be a speculative entrepreneur. It also tells us much about the sophisticated transport arrangements and commercial institutions that allowed for inter-continental trading. However, increasingly, the technicalities of the process by which the Kinetoscope and Cinématographe were invented appear suspiciously teleological. As the first section of this thesis has proposed, the mutual intelligibility of cinema technology as moving picture exhibitions was not inevitable. To build a continuity between the processes of invention and the uses of the medium it may be necessary to look beyond individual events and people to another layer of determination and to consider the collective interpretation of the various pieces of machinery that were put before the public as both technologies which give pleasure and as representations of what science and technology had achieved.

The intersection of Thomas Edison, August and Louis Lumière, and Robert Paul with Edwin Porter, Georges Méliès and Cecil Hepworth, however, has provided a grid of technological and stylistic alternatives able to meet most historiographic contingencies. Selective use of evidence from each contributor can help make sense of the events in the decade around 1895. However, as the survey above suggests, there are significant discontinuities between these figures that are not easily reduced or reconciled, and, as more detailed historical evidence comes to light, these discontinuities return us to the questions about the process through which the Kinetoscope and Cinématographe were invented. However, in rejecting the traditional explanations of great men and "firsts", and devolving the answer to the economics of film-making and the sociology of reception as "new film history" has done, there is a tendency to defer questions about the processes which led to the invention of cinema to the years immediately following the "invention" and its subsequent use as an entertainment. If, however, we insist on asking how and why the cinematograph as an entertainment form was invented, we are led to reconsider the cultural process which gave a rather simple invention that particular complex, mutual intelligibility that we call the
“cinema”. For this we need to revisit “new film history” and its methodologies as well as looking more closely at the cognitive processes of invention and the relationship between the apparatus invented and the audiences’ expectations of science and technology as an idea: in short, to re-run the current state of early cinema history through a matrix which included early cinema audiences’ participation in the attenuated process of making sense of inventions.