Serpentine Dance: Inter-National Connections in Early Cinema

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(Text for the Honorary Research Fellow Lecture given at Goldsmith's College, University of London, 27 October 1998, and later published under the above title as Occasional Papers in Modern Languages, Culture and Society, Issue No. 1, May 1999, by the Department of European Languages, Goldsmiths College, University of London.)

For the past hundred years, the history of the invention of moving pictures has been told, in both scholarly and popular works, almost exclusively from a nationalist perspective. For the Germans, it was Max Skladanowsky, the first inventor to give a public performance of moving pictures to a paying audience in Europe, at the Wintergarten Theatre on November 1, 1895, who was the true inventor of the cinema. The French have always chosen a different date for this important European event, namely December 28, 1895, when the brothers August and Louis Lumière began public exhibitions of their Cinématographe in the cellar of the Grand Café on the Boulevard des Capucines, at the corner of the rue Auber in Paris. To the French, it is only the extraordinary dissemination of the Lumière Cinématographe, which reached six continents over the next year, that established moving pictures as a new medium.

Not to be outdone by the Continent, the British produced a major theatrical film about their candidate for the role of true inventor of the movies, William Friese-Greene, most of whose interesting work was done in the period between 1893 and 1895. *The Magic Box*, made in 1951 for the Festival of Britain, is in fact quite a fine film, notwithstanding that in portraying the work of Friese-Greene it chose as its central figure someone whose work was decisively discredited later in the 1950s by the historian Brian Coe.

There was no sign of slackening of this nationalist perspective during the recently observed centenery of moving pictures, as the outstanding German filmmaker Wim Wenders produced an amusing feature film recounting the adventures of Max Skladanowsky, and the French nearly issued a new 200 Franc note portraying the Lumière brothers, until controversial questions about collaboration with the Vichy regime arose. I expect that in the next few years that the British, who are somewhat slower about such things, will have another candidate to put forward, perhaps Wordsworth Donisthorpe, whose legacy includes ten extant frames of celluloid film taken in Trafalgar Square in 1890.

But what --- I hear you ask --- about Thomas Alva Edison, the Wizard of Menlo Park? Yes, the Americans are secure in their belief that the movies come from America, specifically from the fertile mind of Edison, whose early invention of the Kinetoscope seems to give him the most prominent claim of all to be the true inventor of the cinema; after all, we do still use celluloid film 35mm wide to show movies in theatres, a standard first set in his apparatus of 1894. This, of course, is the major league: the fight between the Lumières and Edison, a battle heavily cloaked in a myriad of American/European issues. In France, the motivating subtext for the liveliness of this argument is continuing commercial competition between the French film industry and an all-encompassing Hollywood system. In Germany, where a national presence on the world market has been but a pipedream since the 1920s, the motivating subtext for its

continuance has been more directly political, as championing Skladanowsky's claims was a direct policy of the National Socialist government in the 1930s, a policy later taken over by the German Democratic Republic, since the inventor's home and early experimental sites fell into the eastern region of the long-divided country.

If we look at the specialist literature about early cinema, the same pattern is repeated. Notwithstanding that we now live in an era of multinationalism and the EU, American scholars have worked on exclusively American topics, the French on exclusively French topics, the British on exclusively British topics and the Germans on German topics, although both the Germans and the Italians harbour domestic specialists in the Lumière oeuvre. The Spanish, suffering from the lack of a major figure involved in invention, have concentrated principally on the domestic presentations of early cinema exhibitors, as have the Dutch and Belgians, who jump back to important optical experimenters of the 18th and early 19th century as significant predecessors of the moving picture inventors (which they were).

Within this scholarly film historical literature we find a more detailed story of the invention of modern moving pictures, but one that generally conforms to a nationalist outline even as it becomes more divisive and problematic, as historians in each nation have developed a wide panoply of individual figures who are thrust forward sometimes as being the true chronological originators of the first moving pictures, or moving picture shows, or whom, on the other hand, in a subtle shift of emphasis, are proposed as being if not quite the first, then the most significant contributor to the medium's origins. Very briefly, this expands the cast of characters in the United States mentioned above to include Edison's assistant W. K. L. Dickson, along with C. Francis Jenkins and Thomas Armat, the chronophotographer Eadweard Muybridge, and the entire Latham family; In Germany the chronophotographer Ottomar Anschütz and Oskar Messter; in Great Britain the elusive Wordsworth Donisthorpe, Aimée Augustin le Prince, Birt Acres and Robert Paul; and in France the chronophotographers Étienne-Jules Marey and his assistant Georges Demenÿ, plus Charles Pathé and Louis Gaumont, who are the surviving contenders, if you will, from a list that once also included Henri Joly, Pierre-Victor Continsousa, and others. If there ever was a fussy, introverted, and exquisitely tortuous academic snake-pit, this is it.

Little wonder, then, that most contemporary early film historians --- whose work leaps quickly over the period of invention and gains its substance and momentum with the evolution of a narrative grammar for the storytelling film in the period from 1900 onwards --- simply avoid the minefields of the period of invention and surrender to a formula of words that says that "Moving pictures were invented almost simultaneously in a number of countries." But in making this seemingly bland statement, which at least allows some forward progress in work on later cinematic institutions and practises, contemporary historians perpetuate an assumption implicit in all of the preceding work through the last half century, an assumption that the process of invention was linear, that it was some kind of inevitable technological progression that provided only a single solution to the problem of how to capture and reproduce natural motion through photography, that it was a continuous and unbroken passage from invention to industry, and that an individual figure who could be named as the "first" inventor or, alternatively, as the "most significant contributor" to later practise, can be definitively identified and whose accomplishments can be directly related to what we recognize today as the cinema, or the movies.

The crux of the problem is that such a linear structure is based on a retrospective account of moving pictures, itself derived from later stabilized practise

that appeared after the turn of the century. This linear structure becomes a search for the origins only of the later institution of exhibiting narrative films to large audiences in fixed theatres --- our twentieth century mass medium of the movies. Such a linear model based on a retrospective account of later, stabilized practise prejudges its examination of the historical case: by privileging some elements and ignoring others, it cannot provide any adequate explanation of why some artifacts or practises were successful and others unsuccessful. As a result, historical context is unbalanced: the work of some figures is condensed to make it fit the development scheme, other figures are omitted for the sake of neatness, and in general, the flattening of the image of the period leads to oversimplification and a weakening of the relationships between various participants. In the field of the history of technology, this kind of linear model of gradual progression towards a single 'right' solution has been discredited for a decade or more. As Wiebe E. Bijker has written, "once students start expecting linearity, they blind themselves to the retrospective distortions that linear descriptions almost inevitably require. Too easily, linear models result in reading an implicit teleology into the material."[1]

What I would like to do today is to take a fresh look at this period of invention, and the immediately following first year of moving pictures in an attempt to bring out some themes that have been hidden by this linear and nationalist approach. My purpose is principally to suggest a more accurate context of the work towards moving pictures in the period, and secondarily perhaps to illuminate some failures of research methodology and scholarly endeavour which have perpetuated an inaccurate picture of a period which was --- and is --- essential to our understanding of the fundamental origins of the most important mass medium of our century.

I: The Period of Invention, 1890-1895.

My first proposition is that with the rarest of exceptions, all of the early inventors in both Europe and America knew each other directly, or knew of each others' work, and they followed developments in the field very closely through professional scientific and photographic journals, patent filings or other activities.

Let us look, then, for a first example, at the evolution of Edison's groundbreaking apparatus, the Kinetoscope. This was a peep-show machine that used 35mm wide film strips to show a single viewer photographed moving pictures, and it was the patents for the Kinetoscope, and its separate camera, that were the basis of Edison's attempts to control American film production until about 1912. When Edison wrote in his first motion picture caveat of October, 1888 in his memorable phrase that he was "experimenting upon an instrument which does for the Eye what the phonograph does for the Ear",[2] he was taking up the suggestion that had been made to him eight months earlier, in February of that year, by the pioneer of chronophotography, Eadweard Muybridge, that Edison combine moving pictures with recorded sound, a suggestion which, in fact, had been made by several others as early as 1879, two years after the appearance of the phonograph. In this first of four stages of development of the Kinetoscope, the apparatus used a sheet of celluloid film holding 42,000 miniature images and wrapped around a cylinder somewhat larger than a phonograph cylinder, which was viewed through a long conical horn with a magnifying lens at its far end. Quickly abandoning this line of research in late 1889 as impractical, Edison's team then briefly toyed with the concept of arranging larger separate photographs around the

circumference of a turning disk and illuminating them intermittently by means of an electric spark.[3] This experiment, even down to the electrical circuits which generated the illuminating flash of light, was a direct copy of the apparatus of Ottomar Anschütz, whose Schnellseher, as he called it, had first been exhibited in New York City in April, 1887, and was the cover story in "Scientific American" in November, 1889.[4] This line was also quickly abandoned, and the third incarnation of the Kinetoscope appeared after Edison returned from a trip to Europe where, amongst other activities, he had been entertained by the eminent French scientist and chronophotographer Étienne-Jules Marey in Paris. Now, the Kinetoscope camera used long bands of celluloid film 3/4 inch wide running horizontally through the apparatus, after the manner of Marey's groundbreaking laboratory cameras for the analytic study of motion.[5] Edison simply added sprocket holes to drive the films through the machine with secure registration of the images. This prototype was actually demonstrated to a visiting women's club in May 1891, but there would be one more stage in its development before the apparatus was finished and ready for sale in Spring, 1894, when it evolved into using film 1 1/4 inches, or 35mm, wide running vertically through the machine.

The case of the Edison Kinetoscope is not at all unique as an example of international awareness of moving picture experimentation during the period of invention; similar assemblies of prior work appear in the work of the American team of C. Francis Jenkins and Thomas Armat,[6] and the eminent French historian Laurent Mannoni has called the Lumière Cinématographe itself an instrument based on ideas collected from Étienne-Jules Marey, Émile Reynaud, Thomas Alva Edison and, not least, Georges Demenÿ[7]. Demenÿ shared his ideas for a "Grand projecteur" with Louis Lumière at a meeting in Demenÿ's studio in December, 1894, just as the Cinématographe was in its earliest stages of development, and Demenÿ's sketches of his claw intermittent movement made at that meeting still exist, a striking premonition of Lumière's elegant moving picture machine.[8] But the most illuminating evidence of the Lumière's awareness of the work of others comes in a letter sent from Paris by father Antoine to his two inventive sons, in Autumn 1895 when he urges that they must quickly and immediately hold a public screening of their moving pictures. He knew, he said, of two other machines that were nearing completion by inventors in Paris, as well as the imminent appearance of the Skladanowsky brothers from Berlin, and if they did not act quickly, they "would not be the first" to exhibit moving pictures publicly.[9]

In fact, an awareness of experimental work leading to projected moving pictures was not limited to inventors, mechanics, and manufacturers. In early Autumn 1895, F. A. Pickering, a talent agent for the Empire Theatre in Leicestere Square, London was on one of his periodic tours of the Continent searching for new attractions for the theatre. In November, he reached Berlin, where he saw the Skladanowsky screenings at the Wintergarten Theatre, and immediately recommended their new act to his management. Pickering has left us an interesting eye-witness description of these screenings, but more importantly, he said in recalling the events "I had already read of the moving picture apparatus and was most anxious to see one."[10] At this early date, since no apparatus in Europe had yet been shown publicly, Mr. Pickering was indeed very well informed. Another example of how a growing interest in the gestating new attraction had spread beyond the community of inventors might be the Stollwerck Chocolate Company in Germany. This unusual company, still active today, had in the 1890s a special interest in automats and vending machines which were widely used in retailing their chocolates. From their headquarters in Cologne, the Stollwerck Company became, in chronological order, a partner in the exploitation of the Edison Kinetoscope

in Germany and Austria, which was not a successful endeavour; a partner in a company established by a Swiss businessman and the French inventor Georges Demenÿ to promote Demenÿ's Phonoscope device; tried but failed to buy out the remaining stock of some 54 of Ottomar Anschütz's Schnellsehers from their manufacturer, Siemens & Halske in Berlin; hired the British film pioneer Birt Acres to make the first films in Germany, of the opening of the Kiel Canal in June, 1895, and contracted with him to supply projectors, kinetoscopes and films for their automat-halls; and, finally, gained the German concession for the Lumière Cinématographe, which they successfully introduced in Germany from May, 1896, ultimately exhibiting it in many cities and towns over the next 18 months.[11]

II: Technology transfer in the year 1896.

My second proposition is that the rapid spread of moving picture technology, of filmmaking and of exhibition in the year 1896 was not brought about, as most modern historians have written, simply by simultaniety of invention in several countries, but rather by a conscious effort involving international business and trade contacts.

In the year 1896, the first full year of public moving pictures, the new novelty spread across all of Europe, North and South America, North Africa, Australia with breathtaking speed. Once the technological principles of moving pictures was known, it was not very difficult for an experienced precision workshop to manufacture a device that would provide an adequate moving picture for audiences in theatres, fairgrounds, public houses, and other formal and informal entertainment sites. Many did so. But what is perhaps most remarkable about the spread of cinematographic activity in this year is the number and amount of international contact and cross-border technology transfer, both official and unofficial, that took place. Just a very few examples will be cited here, but they are all examples which are found within the nationalist literature written by European historians, but which have not yet been incorporated into the corresponding nation's historical accounts.

In Britain, the electrical engineer and film pioneer Robert William Paul was the first to offer projection apparatus for sale, in February, 1896; he was selling machines even before he arranged his own public exhibitions, and his apparatus was in use in Spain, Portugal, France, Germany, South Africa, Australia, The Netherlands, Sweden, and Italy before the end of the year.[12] His machine had a few very special customers. In France, the magician Georges Méliès, unable to buy a Cinématographe from the Lumière brothers, purchased one of Paul's machines to start film exhibitions at his Thêatre Robert Houdin in Paris; by Summer, 1896, Méliès had converted this apparatus into a camera and began making his own remarkable films.[13] In Germany, the young optician Oskar Messter had a Paul machine brought to him for repair, just at the time he was tinkering with his own moving picture experiments; by his own account, it was through examining this Robert Paul projector that gave Messter the "secret" of how to build a successful projector,[14] and as still-existing contemporary sketches make clear, his first machines, sold from June, 1896, were copies of the Paul apparatus.[15]

In fact, the machine that was brought to Oskar Messter, who became "the Founder of the German Film Industry", was a pirated copy of Paul's original, for as Messter wrote in later correspondence with Paul when he was preparing his autobiography, there were two companies in Germany at the time selling unauthorized copies of the British device.[16] By September, 1896, the German showman's magazine

Der Komet reported that "The Berlin workshops have taken up the manufacture of apparatus that is not patented in Germany, and have already found considerable success."[17] Many of these machines were of French origin, copies of devices first made by Pierre-Victor Continsouza, the magic lantern firm of Clément & Gilmer, or the early but short-lived workshop of George William deBedts. Copies of their originals were made by H. O. Foersterling & Company in Berlin, Dr. Adolf Hesekiel in Berlin, and several other firms[18].

This international traffic was multidirectional, however. When Oskar Messter went to the workshops of Gliewe & Kügler in Berlin to browbeat Max Gliewe into working only for him, ---- I use this term advisedly, since Messter claimed Gliewe was violating Messter's patents, even though at the time he had only made applications for patents which were never granted --- Messter found that Gliewe already had an order for 50 machines from the British amusement arcade manufacturers Haydon & Urrey of Upper Street, Islington in London.[19] Messter agreed that Gliewe could fulfil this order, which became the basis of the Haydon & Urry Eragraph, a machine widely used in Great Britain before the turn of the century. Other British magic lantern or photographic firms, like J. W. Rowe & Co. of London and R. J. Appleton & Co. of Bradford, also issued their own copies of the Continsouza or Clément & Gilmer Paris designs.

What was true of moving picture hardware was equally true of its software, the films themselves. An English agent, F. A. Young of Kennington Road in London, advertised in Germany as early as July 1896 that he could supply German, French, English and American films.[20] By the end of the year, the German firm of Philipp Wolff was firmly established with offices in Berlin, London and Paris, offering both their own apparatus as well as "an immense stock of all the films that are worth having from all parts of the film-producing globe", representing, amongst others, the films of the Lumière brothers, Georges Méliès, and Robert Paul in the capital cities of Europe.[21] The "international" subjects of early films were extended by taking films of the Japanese costumes, African villages, and Arabian dancers that were transported wholesale to European exhibitions, such as the Geneva Exposition of 1896. Birt Acres even made a film of the Canal Grande in Venice with its Gondoliers in June, 1895, which mightily confused film historians until just last year, since nobody could figure out which filmmaker could have visited Italy at such an early date: it turns out that Acres used a full-sized replica of the Canal, with imported boatmen, that was created for Hamburg's Italian Exhibition that ran concurrently with his trip to Kiel to photograph the opening ceremonies of the Canal.[22]

III. The questions not asked.

My third, and final, proposition shifts the ground away from empirical examples of international connections in early cinema and asks two questions: Why has this evidence about the internationalism of early cinema lain fallow for over half a century, and what can it tell us about the present situation in moving pictures ---- a present situation now elaborated into television delivery systems, whether terrestrial or satellite, analogue or digital?

Here, we have to look at the nature of scholarly and historical endeavour in the field. It was the American historian Gordon Hendricks who carefully and painstakingly followed the day-by-day evolution of the Edison Kinetoscope for his book of 1966.[23] For the next thirty years, no German article or monograph on the work of Ottomar Anschütz

incorporated his revelations that one entire stage of the development of the Kinetoscope was based on Anschütz's approach to moving pictures. The connection between Max Gliewe and the firm of Haydon & Urry in Islington first appeared in the German literature in 1936, and was repeated in an important secondary article again in 1966,[24] yet it has never appeared in English accounts of the latter company, not even in the monumentally detailled five-volume history of British film up to 1900 written by John Barnes, which is our major source of information on Haydon & Urry's activity. No German scholar has worked with the documentary records of the the Electrical Wonder Company of London, who were Ottomar Anschütz's world-wide agents for his Schnellseher, at the Public Record Office in Kew, and no British historian has worked with the important records of Birt Acres' activities held at the Stollwerck Archive in Cologne. Such *lacunae* could be perhaps excused by the still-tentative academic standing of film history, by inadequate language skills, by the necessarily localized nature of much early film research, by insufficient funding for scholarly activity, or by the sheer disinterest of either scholars or publishers in extending their accounts across borders in a field already deemed highly specialized.

But I would rather propose that the difficulty comes from a fundamental lack of perspective which lies behind most work in the field. As suggested earlier, the separatist and nationalist histories which began to be written in the 1910's and were firmly established by the 1940's had only one principal goal: to lay retrospective claims to the origins of a huge and hugely popular international medium that had quickly spread throughout Europe and North America. This history was, in effect, "company history", a history based on the later success of the stabilized technology involved. As John M. Staudenmaier wrote, "Success stories are 'company history' in the sense that they reinforce their own conceptual starting point. If the historian believes that technology must have developed in the way it did, it is natural that s/he will write its history as if it were inevitable. This kind of history, insofar as it becomes accepted by society at large, tends in turn to confirm the original premise of determinism and to foster its influence."[25]

Overlooked in this insider history which projected a later stabilized institutional practise into the period of invention is the fact that the inventors we have discussed above had very little, if any, anticipation of what moving pictures would turn out to be. They were all inventing something different, not only technically but also conceptually. Edison thought they were at best a passing fad and the low priority he placed on this work in his laboratory is only one evidence of his disinterest: he famously thought that if he turned his Kinetoscope peep-show device into an apparatus for film projection, only ten machines would be needed to service the entire country, and he would, therefore, have no economic basis on which to make money from his invention. Max Skladanowsky thought he had found a new mechanical varieté act, useful for only a single season, and abandoned his pioneering exhibitions after touring for a year, in part because his apparatus could not be easily adapted for use by others. The Lumière brothers, like Georges Demenÿ, thought they were making a mass market Kodak camera with pictures that moved for use in the home and for use by amateur photographers. This would provide --- as the Kodak provided for George Eastman's company --- a vast and habitual customer base for their sales of raw film stock, their central manufacturing activity. Robert Paul thought the main use of moving pictures, after the fad for its public exhibition in variety halls had quickly passed, would be in advertising, and in 1898 he tried unsuccessfully to raise the capital for a company based on this idea. Dr. Adolf Hesekiel remains in the historical literature perhaps the

most obscure of the examples cited above since he considered that “the future of Kinematography lies not in the reproduction of more or less sensational experiences, but in the recording of scientifically interesting moments”[26], and made his first films in Mendel’s clinic in Berlin while manufacturing and selling an apparatus specially arranged for showing scientific films made in short loops.

Only very slowly did moving pictures metamorphose into a set of institutional practises which privileged the exhibition of narrative stories in fixed theatres for large audiences. In the beginning motion pictures had all of the characteristics of multiple sites, varied purposes, competing formats, and alternative delivery systems that have again become prevalent the past decade. Today we are surrounded not only by film, television, videotapes, and full-motion graphics on computers, but competing systems in terrestrial broadcast, satellite, cable and internet distributions, as well as choices between analogue and digital formats. The situation of moving pictures at the beginning was not so very different, nor was it so different from the evolution and dissemination of railroads, the telegraph, or the process of electrification in Europe and North America. A clearer picture of the international and diverse nature of the origins of moving pictures, a history which is not yet written, may provide more realistic clues to why some proposals were successful and others failed, why some suggestions were dead ends and others led to new innovations. Until there is a proper account of the origins of our visual culture and its media technology that takes into consideration its full international dimensions, the choices faced by present day entrepreneurs and audiences alike will continue to be based on myths, legends, and ahistorical self-fulfilling prophecies.

NOTES

1. Wiebe E. Bijker: *Of Bicycles, Bakelites, and Bulbs. Toward a Theory of Sociotechnical Change*. (Cambridge/London, 1995: MIT Pres), p. 7.

2. Motion Picture Caveat I, Thomas Alva Edison handwritten original, 8 October 1888, *cit*. Gordon Hendricks, *The Edison Motion Picture Myth*, (Berkeley/Los Angeles, 1961: University of California Press), p. 158.

3. W. K. L. Dickson and Antonia Dickson: "Edison's Invention of the Kineto-phonograph", In: *The Century Illustrated Monthly Magazine*, June 1894, p. 208.

4. See Deac Rossell: *Ottomar Anschütz and his Electrical Wonder*, (London, 1997: The Projection Box) for a thorough overview of the development and dissemination of the Anschütz Schnellseher.

5. See Marta Braun: *Picturing Time. The Work of Étienne-Jules Marey (1830-1904)*, p. 189-90, of an account of this meeting.

6. See Deac Rossell: *Living Pictures. The Origins of the Movies* (Albany, 1998: State University of New York Press), p. 120-21 for details of the progression of Armat and Jenkins with their apparatus.

7.See Laurent Mannoni: "Glissements progressifs vers le plaisir. Remarques sur l'oeuvre chronophotographique de Marey et Demenÿ", In: *1895*, No. 18 (Été 1995), p. 32-3 for details.

8. *ibid*., p, 33.

9. Letter of Antoine Lumière to Louis Lumière, October 1895, Coll. Cinémathèque française. I am indebted to Laurent Mannoni for this information, as the letter was not published in the recent collection of Lumière correspondence edited by Jacques Rittaud-Hutinet.

10. F. A. Pickering, letter to *To-Day's Cinema*, 13 March 1936, p. 1 & p. 10.

11. See Martin Loiperdinger, *Film und Chokolade. Stollwerck importiert den Cinématographe Lumière*. (Frankfurt am Main: Stroemfeld) forthcoming, 1998, for a full discussion of Stollwerck's involvement in early cinema experiments.

12. See Deac Rossell: "The New Thing with the Long Name and the Old Thing with the Name that isn't much Shorter: A Chronology of Cinema, 1889-1896", special issue of *Film History*, V. 7, No. 2 (1995) for specific exhibitions and use of this apparatus.

13. See Laurent Mannoni: "Méliès contrefacteur?", In: *1895*, No. 22 (1998) for a full discussion of Paul's apparatus purchased by Méliès.

14. Oskar Messter: *Mein Weg mit dem Film* (Berlin-Schöneberg, 1936: Max Hesses Verlag), p. 10.

15. Christian Ilgner & Dietmar Linke: "Filmtechnik -- Vom Malteserkreuz zum Panzerkino", In: Martin Loiperdinger, ed., *100 Jahre Kino. Oskar Messter, Filmpionier der Kaiserzeit*. KINtop Schriften 2. (Frankfurt a. M., 1994: Stroemfeld/Roter Stern), p. 96-7.

16. Letter of Robert W. Paul to Oskar Messter, 5 August 1932, Messter-Nachlaß Box 551, Bundesfilmarchiv. I do not have a copy of Messter's enquiry to Paul, but Paul replies, in part, "I was aware that copies were being made, in a crude fashion, by at least two mechanics, and on account of the strong demand, sold in few cases [*sic*] at high prices."

17. *Der Komet*, Nr. 600, 19 September 1896, p. 3.

18. See Deac Rossell, “Jenseits von Messter -- die ersten Berliner Kinematograhen-Anbieter”, In: *KINtop -- Jahrbuch zur Erforschung des frühen Films* 6 (1997), p. 167-184,; or Deac Rossell “Beyond Messter: Aspects of early cinema in Berlin”, In: *Film History*, V. 10, No. 1 (1998), p. 52-69, for details of German importation of foreign apparatus in this period.

19. Oskar Messter, *op. cit.* p. 11-12, & Albert Narath: *Oskar Messter, der Begründer der deutschen Kino- und Filmindustrie* (Berlin, 1966: Deutsche Kinemathek e. V), p. 12.

20. *Der Artist*, Nr. 596, 12 July 1896.

21. For Wolff, see Deac Rossell, as n. 18; the quote is from *Amateur Photographer*, Vol. 26, No. 677 (24 September 1897, p. 266.

22. See Deac Rossell: “Venice Showing Gondolas. Una novità assoluta per la filmografia del primo cinema italiano”, In: *Segnocinema* (Venice) anno XVIII, n. 90 (Marzo/Aprile ‘98), p. 74-5 for details. The documentary evidence was found by Martin Loiperdinger in the Stollwerck Archive in Cologne, in the form of a letter from Stollwerck’s agent in Hamburg who was guiding Acres around and which stated: “tomorrow we will go to the Italian Exhibition and try to take a film of the Canal Grande....”

23. Gordon Hendricks: *The Kinetoscope* (New York, 1966: Beginnings of the American Film).

24. Oskar Messter, *op. cit.* [1936] and Albert Narath, *op. cit.* [1966].

25. John M. Staudenmeier, S. J.: *Technology’s Storytellers. Reweaving the Human Fabric.* (Cambridge/London, 1985: Society for the History of Technology/MIT Press), p. 146.

26. Report of the meeting of the Verein zur förderung der Photographie, Berlin, on 10 December 1897, In: *Photographische Mittheilungen*, 34. Jg., Nr. 20, 1898, Jan. Heft 2, p. 315: