

VIDEO

Arthur Van Gehuchten takes neurology to the movies

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Abstract—Objective: To present the cinematographic production of Arthur Van Gehuchten (1861–1914) and to put this collection into its medical and sociocultural context. **Background:** The arrival of Edison's Kinetoscope (1891) and Lumière's Cinématographe (1895) provoked the immediate interest of neurologists who foresaw the potential of motion pictures for illustration, research, and teaching. **Results:** Arthur Van Gehuchten, professor of anatomy and neurology at the Catholic University of Louvain, was trained as a microscopist and a cytologist. From neuroanatomy, he progressively broadened his interest to neurology. Van Gehuchten was an avant-garde teacher, eager to adopt new visual aids. In 1895, he attended the first cinematographic screenings. Medical cinematography was soon brought into disrepute in European academic circles, when films made by the French surgeon Doyen were copied and shown on fairgrounds. Nevertheless, in 1905, Van Gehuchten began to film neurologic patients. He used this technique extensively to demonstrate clinical signs, to illustrate neurologic diseases, and to document functional evolution following surgery. For decades, these films were screened for medical students by Van Gehuchten's successors to the chair of neurology. The original nitrate films (more than 2 hours) have been recently rediscovered. They have been restored by the Royal Belgian Film Archive, where they are the oldest Belgian films. **Conclusions:** At the beginning of the 20th century, Van Gehuchten built up a collection of moving pictures for teaching purposes. This was one of the first such undertakings. This unique set of films has miraculously survived, and serves as an important archive of nervous diseases and their manifestations prior to the advent of modern therapies.

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Motion pictures are an essential tool for neurologic diagnosis, follow-up, teaching, and research. The advent of easy-to-use video cameras in the 1980s has rendered this practice very common, particularly in the fields of epilepsy and movement disorders. Specialized journals such as *Movement Disorders* or *Epileptic Disorders*, and now *Neurology*, include videos as part of their illustration. Recently, video technology has given way to high-quality, durable digital images. These major advances in communication technology should not obscure the fact that filming neurologic patients is as old as cinematography.

The year 1895, the year of the first public screening organized by the Lumière brothers in Paris, is accepted as the date of birth of cinematography.¹ However, as for most technologic advances, no single date or person epitomizes this invention. At least three countries have entered the contest of who invented cinema: France, the United States, and Germany.¹ What was common to all the early cinematographic equip-

ment was the use of cellulose nitrate film—a highly unstable, organic material that decomposed, burned, and exploded. This extremely perishable medium partially explained why more than 80% of the world production of silent cinema has been irretrievably lost.^{2,3}

To celebrate the centenary of cinema, the Royal Belgian Film Archive decided to inventory all Belgian films and to publish a book of this complete catalog.⁴ Forgotten reels were rediscovered during the filing of their collection. Among them were canisters bearing the label “Medical films, UCL.” Presented to the Faculty of Medicine of the Université Catholique de Louvain (UCL), they were identified as films made by the Belgian anatomist and neurologist Arthur Van Gehuchten (1861–1914). Neurologic films made by Van Gehuchten had been shown to medical students for decades.

This was the starting point of this study: to give an overview of the content of this cinematographic collection, to precisely date this output, and to specify its part in Van Gehuchten's work. A second objective was to put this collection into its medical and sociocultural context.^{1,5-7} As neurologists had been

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much involved in the beginning of medical photography, in the development of chronophotography, and in the first clinical applications of these techniques,⁸ it was to be expected that other similar cinematographic collections would surface. Soon, however, it appeared that Van Gehuchten's collection was exceptional, quantitatively and qualitatively, both in his own time and even more so one century later.

Materials and methods. *Films.* Arthur Van Gehuchten's 35-mm original nitrate films (more than 2 hours) were restored in the laboratory of the Royal Belgian Film Archive. They are now safely stored in their vaults. During this study, later copies of 35-mm, 16-mm, and 8-mm films were discovered at the Library of the Faculty of Medicine of the Université Catholique de Louvain and in private collections. Additional footage (1 hour), of which the original had not been conserved, was found on these later copies. The original films were copied onto acetate and all the films were transferred to videotape and later to a digital submaster.

Written primary sources. Written primary sources included published articles, monographs, and books by Arthur Van Gehuchten; archives from the Université Catholique de Louvain and Katholieke Universiteit Leuven, Belgium; *Annuaire de l'Université Catholique de Louvain*; *Bulletin de l'Association Belge de Photographie*; *Le Névrose*; *Nouvelle Iconographie de la Salpêtrière*; and Belgian periodicals and journals dedicated to cinematography.

Written secondary sources. Published material concerning Arthur Van Gehuchten and concerning medical cinematography before 1914 was located in Belgium at the Royal Belgian Film Archive (Brussels) and the Vlaams filmmuseum en archief (Leuven); in France (Paris) at the Bibliothèque Charcot of the Salpêtrière Hospital, the Cinémathèque française, the CNRS, and the Center National de la Cinématographie (Bois d'Arcy); and in the United Kingdom (London) at the Wellcome Library and at the British Film Institute.

Arthur Van Gehuchten, anatomist and neurologist. Arthur Van Gehuchten is an important founder figure of the neurologic sciences (figure 1).⁹⁻¹² Born in Antwerp (Belgium) in 1861, he first studied biology at the Faculty of Sciences of the Université Catholique de Louvain. He was introduced to microscopy and scientific research in the laboratory of Jean-Baptiste Carnoy, a well-known botanist and cytologist. Van Gehuchten's first paper on the structure of muscle cell was published in *La Cellule*, the journal founded by his master.¹³ His work influenced Santiago Ramón y Cajal and led to correspondence between the two men and the beginning of a lifelong friendship and mutual regard.¹⁴ Having obtained his doctorate degree in natural sciences, Van Gehuchten went to Frankfurt am Main in Germany. There he discovered neuroanatomy under the guidance of Carl Weigert and Ludwig Edinger. In 1889, Van Gehuchten



Figure 1. Arthur Van Gehuchten. Photographic portrait and signature, from Anton Mansch. *Geistige Welt. Galerie von Zeitgenossen auf dem Gebiete der Künste und Wissenschaften*, Berlin: A. Eckstein, 1908. Courtesy of the Archives de l'Université Catholique de Louvain, Louvain-la-Neuve, Belgium.

was appointed Professor of Anatomy at the Faculty of Medicine of the Université Catholique de Louvain, although he was not yet an MD. Alongside Cajal, Van Gehuchten actively participated in the formulation of the neuron doctrine and laid the foundations of the law of dynamic polarization of the neuron.^{11,14,15} In 1893, while studying medicine, he published one of his major works: *Le système nerveux de l'homme*,¹⁶ which became a classic text, going through four editions.¹⁵ In 1894, Van Gehuchten obtained his MD. Soon he developed an interest in nervous diseases, and in 1896, was one of the founders of the Belgian Society of Neurology. With his encouragement, the first operations on the brain and spinal cord were carried out in Belgium. The first neurologic department in Belgium was created for him in 1908, signaling the recognition of his commitment to the field. His labor was cut short in 1914 with the outbreak of the World War I. The German invaders

burned down many buildings in the center of Louvain, including his house. A few months later, Van Gehuchten died unexpectedly at the age of 53 in Cambridge (UK), where he had been welcomed at the Research Hospital (currently Strangeways Research Laboratory). He had just completed his neurologic textbook, *Les Maladies Nerveuses*,¹⁷ which was published after the war in 1920 thanks to the endeavors of his son Paul, who would later succeed his father as the Chair of Neurology.

Visual aids for anatomy and neurology. As a researcher, Arthur Van Gehuchten took great care in the illustration of his work. Artistic India ink diagrams or watercolor drawings accompanied his microscope observations in his articles. As a teacher, he was very eager to adopt new visual aids in order to stimulate the interest of his audience.¹⁰

In 1895, Van Gehuchten was introduced to photography and attended the first cinematographic projections. François De Walque, engineer and professor of industrial chemistry at the University of Louvain, played a key role in this introduction. De Walque had been one of the founders of the Belgian Association for Photography in 1874. This society brought together scientists, artists, and photographers, both amateurs and professionals. In 1894, with a physicist, Van Tricht, De Walque started a local section in Louvain, which soon acquired a strong scientific character.¹⁸ Van Gehuchten immediately adopted photography in his anatomic and clinical work. In 1899, he went to Ghent to visit the bacteriologist Emile Van Ermengem, also a member of the Belgian Association for Photography and a pioneer of photomicrography, to seek advice on this matter.¹⁹ Today, the archive of the Faculty of Medicine (UCL) still maintains more than 600 of Van Gehuchten's original photographic gelatin glass plates (figure 2).

Belgium was the first country outside of France to get a demonstration of the Lumière Cinématographe in 1895.²⁰ The Belgian Association for Photography organized a first private screening in Brussels on November 10. Three days later, a similar presentation of the Cinématographe took place in Louvain, in the physics institute of the university. Ten years were to pass before Van Gehuchten began to film neurologic patients.

Beginnings of medical cinematography in France. Cinematographic screenings met with immediate success. First seen as an interesting technical development of photography, the invention was shown everywhere in Europe and the United States. Within a few months, it became a popular entertainment. Technicians were formed to master the various crafts. New professions appeared: cameraman, director, editor, producer, and projectionist. Cinematography was presented in music halls among variety shows and in itinerant booths on fairgrounds, where it attracted thousands of curious onlookers.^{1,20}

Paris had been the hub of the rich interactions



Figure 2. Van Gehuchten's photograph, showing the Jendrassik maneuver to reinforce knee jerk (figure 186 of *Les Maladies nerveuses*¹⁷). Original glass plate scanned and digitalized by the Museum voor Fotografie, Antwerp, Belgium.

between the nascent disciplines of neurology, photography, and chronophotography.⁸ At the Salpêtrière, Charcot established a photographic laboratory run by Albert Londe.²¹ With Paul Richer, Londe played an original role in the development of time-lapse photography.^{7,22} Another new iconographic technique, X-rays, which were discovered by Roentgen also in 1895, was immediately adopted at the Salpêtrière, where Londe was appointed to set up the first radiography laboratory in Paris.²³ By contrast, cinematography did not officially enter the Salpêtrière for a long time. In 1898, on a personal initiative, Londe purchased a movie camera and experimented with this new technique. With Richer, he made 10 short films of neurologic patients.²⁴ They were never used in any publication. Only isolated, blurred frames seem to have survived (Gunthert, personal communication). In 1903, Londe left the Salpêtrière.

Another potential source of cinematographic reference was the journal *Nouvelle Iconographie de la Salpêtrière*, founded in 1888 by Richer, Gilles de la Tourette, and Londe under the direction of Charcot and published until 1918. Thanks to new procedures

of photographic reproduction, it published articles selected because of their visual material. However, references to medical cinematography in France are scarce. The first article dedicated to cinematography in this journal dates only from 1900 and came from Romania.²⁵

Surgical cinematography, from innovation to scandal. Social prejudice against the new medium may explain the slow emergence of medical applications for cinematography in France. More importantly still, Doyen certainly played a role in inhibiting the take-off of medical cinematography.

Eugène-Louis Doyen was a brilliant and bold French surgeon practicing in a private clinic in Paris.^{1,26-28} He tackled all surgical domains, including neurosurgery. In 1898, he hired two established cameramen and asked them to film him while he was operating. A few months later, he presented three films at the British Medical Association in Edinburgh; one of these films was about craniotomy. However, the official French medical societies objected; the Académie de Médecine and the French Congress of Surgery prevented him from projecting his films at scientific meetings. In 1899, he founded his own private journal, the *Revue critique de médecine et de chirurgie*. In the first issue, Doyen wrote an extensive article on the potential of cinematography in teaching.²⁹ This article may have contributed to the irritation of the official teaching powers.

Meanwhile, his cameraman had printed and sold numerous copies of his films all over Europe, and soon these films were shown everywhere—even at fairgrounds. Doyen sued his unscrupulous cameraman and won one of the first lawsuits involving a film. The screening of these films in nonmedical circles and at fairgrounds brought cinematography into disrepute among the official medical community and froze further attempts in France for almost 10 years. Not until 1909 were films of patients with chorea, athetosis, and tics shot in Pierre Marie's department at Bicêtre Hospital.³⁰

Of the scores of films directed by Doyen, once conserved by the Gaumont Company, almost everything has disappeared. Only a few minutes of films, none of neurologic interest, have survived (CNRS, Paris; and Center National de la Cinématographie, Bois d'Arcy).

Pioneers of cinematography in neurology.

Germany was the first country to welcome cinematography in a neurology department.^{6,28,30} Recently, Podoll published a remarkable in-depth study of these beginnings.³¹ The pioneer was Paul Schuster, who used cinematography in Berlin as early as 1897.³² Movement and gait disorders were the subjects of these first attempts, with a definite pedagogic objective. Schuster was followed by Kraepelin in Munich, Foerster in Breslau, and Westphal and Hennes in Bonn.^{5,31} Apparently, nothing of this Ger-

man cinematographic output before World War I has survived (Podoll, personal communication).

Independently, in 1898, the Romanian Georges Marinesco began to film neurologic patients with one of his assistants, Constantin Popesco.^{1,26} Following his medical studies in Bucharest, Marinesco had a very thorough education in Western Europe, where he spent 9 years.³³ On his return to Bucharest from Paris, he brought back a cinematographic camera. Between 1899 and 1902, Marinesco published eight papers on cinematography focusing on normal and pathologic gait. He successively studied hemiparesis, paraparesis, hysteria, ataxia, and muscle disorders. The sequences of stills were decoded abstractly in a physiopathologic approach, which was strongly influenced by the chronophotographic studies of Marey and Richer. Marinesco must be credited with the first medical thesis documented by motion pictures.¹ The goal of illustration was also pursued in follow-up records.²⁵ Apparently, Marinesco suspended this cinematographic activity in 1902. The departure of Popesco, his cameraman, as well as the Parisian whiff of scandal around Doyen may explain this sudden interruption. In 1973, reels of Marinesco's original nitrate films were retrieved in Bucharest and copied onto modern films.^{1,26} Only a few segments have been screened,¹ although Cantacuzène speaks of more than 70 patients.²⁶ No catalog is available.

The first published mention of moving pictures in the United States dates to 1905 and came from Boston.³⁴ After reporting the prior attempts of Alex McLane Hamilton, who reproduced pathologic gaits with a Lumière camera, Walter Greenough Chase expounded on the interest of the new medium in medicine. In a paper illustrated with single-frame excerpts, he presented an impressive study of epileptic seizures performed with the assistance of Dr. Spratling and his assistants Collier, Shanahan, and Ross of the Craig Colony for Epileptics. Today, a short sequence of this study is conserved at the Huntley Film Archives (UK). Around 1908, Theodore H. Weisenburg began to take moving pictures of neurologic patients in Philadelphia. By 1912, he had assembled what appears to be the first collection of films of nervous and mental diseases in the United States.^{6,35} He also emphasized the scientific value and the interest of motion pictures for teaching purposes. The original films have not been located.

Arthur Van Gehuchten and cinematography.

In 1907, Van Gehuchten published his first paper illustrated with films³⁶ in *Le Névraxe*, the journal he had founded in 1900. It is a detailed physiopathologic study of a patient with a complex traumatic lesion of the spinal cord. To illustrate the peculiar gait of this patient, Van Gehuchten used some strips of film (figure 3; also see the supplementary video on the *Neurology* Web site; go to www.neurology.org). In a footnote to this paper, he explained that for 2 years he had been using cinematography in neurology. From then on, he began systematically to film neuro-

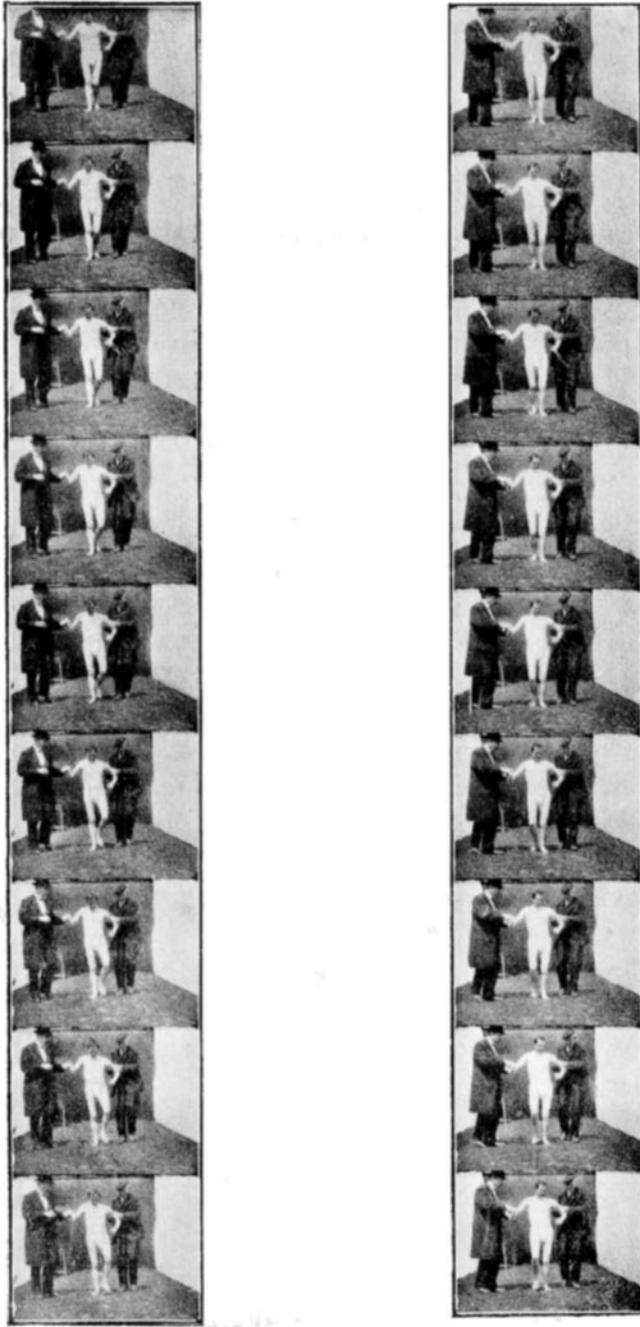


Figure 3. Film strip illustrating Van Gehuchten's first article mentioning cinematography.³⁹ See the supplementary video on the Neurology Web site; go to www.neurology.org.

logic patients with the intention of building up a complete neurologic iconographic collection. This is confirmed by a letter to the rector of the university, dated 16 July 1911:

I take the liberty of submitting in writing to you the request for an extraordinary grant that I had the honor of discussing orally, a few days ago. As you know, my budget for cinematography amounts to five hundred francs per year. The expenses in films for the current year amounted to about fifteen hundred francs. This expense will have to be repeated for two

years, and this because I am obliged to shoot films of all the patients who arrive with an interesting disease, in order to gather a collection for teaching. It is thus with confidence, that I would, with your benevolent intervention, respectfully request Our Lordships, to award me an extraordinary grant of one thousand francs per year for the current year and for the two coming years.

(Author's translation from French. Original letter at the *Universiteitsarchief*, Katholieke Universiteit Leuven, Belgium.)

In the upper left corner of the letter, written by another hand, probably the rector's: "Awarded 1000 francs for the current year's outlays. Say nothing as regards the future."

Van Gehuchten used motion pictures to demonstrate neurologic semiology,^{17,37} to illustrate various neurologic diseases,^{17,38} and to document spontaneous evolution of disease³⁸ or functional recovery following surgery.^{17,39} An avant-garde teacher, he enlivened his lectures for medical students or at scientific meetings with photographic and cinematographic screenings (figure 4).^{38,40} Contemporaries were impressed by these performances.⁴¹

The matching of the original films with Van Gehuchten's publications led to the conclusion that they were the oldest Belgian films surviving at the Royal Belgian Film Archive. The original films contain 120 short sequences (each about 1 minute long). Adding the later copies, Van Gehuchten's cinematic corpus comes to more than 3 hours. The analysis of its content is beyond the scope of this article and will form the basis of future thematic studies. The catalog is extremely varied with regard to patients' ages and clinical material, including gait and movement disorders, neuromuscular diseases, and epileptic and hysteric seizures. Sequences were shot both indoors and outdoors, in the university hospital premises or garden, or in patients' homes. This must have been no small task considering how heavy and cumbersome the equipment was.

Van Gehuchten personally dealt with all the steps of the process, from shooting to screening. With minor exceptions, he is never seen on film. In a small nook near his laboratory, he developed the films himself, selected the sequences, and made the montages at night after dinner, often assisted by his eldest son or daughter.¹⁰

In 1910, the first International Congress for Cinematography was held during the International Exhibition in Brussels. Van Gehuchten was one of the vice-presidents of this meeting.¹⁸ Among the topics discussed were the application of cinematography to scientific research and teaching, as well as the organization and management of archives.

A fabulous neurologic cinematic heritage. The survival of the nitrate films is extraordinary, considering that almost all Van Gehuchten's personal and family papers and belongings disappeared in the burning of Louvain in 1914. Their restoration and

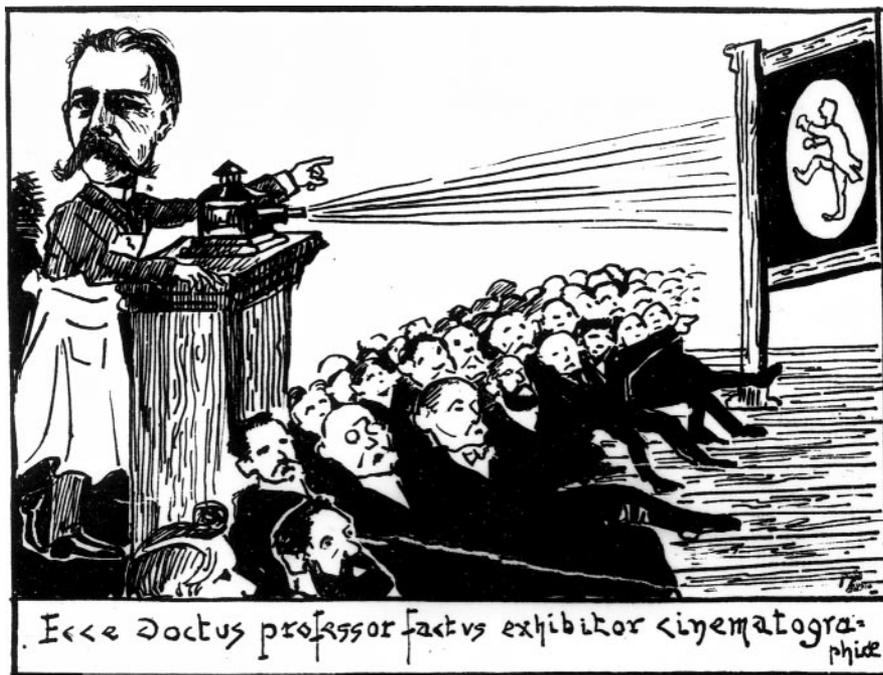


Figure 4. Caricature of Arthur Van Gehuchten. From *Ons Leven*, a student journal of Louvain. Courtesy of Universiteitsarchief, Katholieke Universiteit Leuven, Belgium.

preservation by one of the best film archives in the world is also notable.

Van Gehuchten's collection now appears unique in its size and diversity. These films are both real cinematographic incunabula and exceptional medical documents. Aside from their didactic worth, as fresh today as one century ago, they have acquired a historical value. They disclose the neurologic practice of a physician treating patients from all social backgrounds at the beginning of the 20th century.

Gathering such a collection of motion pictures was a demanding venture, especially as it was the work of a single person, in turn physician, cameraman, director, editor, and lecturer. The difficulties and cost of film making have been emphasized by several authors.^{7,30,35} Van Gehuchten's manual skills, developed in preparing microscope slides, anatomic preparations, and photographic plates, were an asset.¹⁰ The unprecedented academic support he received not only alleviated the expense but also gave his undertaking a guarantee of seriousness. It probably also explains why the films have survived. After the war and the death of Van Gehuchten, the films became part of the visual aids used by Van Gehuchten's successors to the Chair of Neurology in Louvain.

The interface between scientific study and entertainment, between innovation and scandal, has haunted medical cinematography since its early years. The integration of photography in clinical practice, particularly in neurology, had been straightforward. By contrast, cinematography faced unexpected social and psychological barriers. The pioneers had to show a great independence of spirit to take a cinematograph into the hospital ward or to scientific meetings. Even decades later, when motion pictures were accepted as a standard visual aid in neurology, cinematographic activity was not considered worth

mentioning. The biographical notes on Marinesco and Van Gehuchten in Haymaker's *Founders of Neurology*^{9,33} ignored their involvement in cinematography. In 1957, Arthur Van Gehuchten's memory was honored during the International Congress held in Brussels, which marked the foundation of the World Federation of Neurology. But it was as a brilliant neuroanatomist that he was remembered. Not a single word on the subject of his cinematographic activity was uttered.⁴² This long eclipse is all the more surprising because in his own time, this achievement had had a fair degree of publicity and his obituaries in international journals reported it with admiration.^{41,43} Not a single article, chapter, or book devoted to medical cinematography mentioned his name up to the end of the 20th century.⁵⁻⁷

Future perspectives. Motion pictures constitute a hitherto-neglected cultural heritage.^{2,3} The majority of all films ever made no longer exist.³ On both parts of the Atlantic, through organizations such as the International Federation of Film Archives, a few scholars and archivists struggle to ensure the survival and revival of images, following the *Recommendations for the Safeguarding and Preservation of Moving Images* adopted by the UNESCO in 1980.

The situation is even more dramatic for medical films,^{7,44} and particularly for those produced by the pioneers in neurology. Indeed, most were isolated amateurs working outside commercial circuits. Archival films seminars such as those organized by the American Academy of Neurology certainly will give this young field of research a boost. Important documents might still be lying in forgotten cans, silent witnesses of another neurologic era. The films that survive should receive attention and care before the

flickering images of our neurologic past irremediably disappear.

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