

# Ambrotypes: Positively Capturing the Past

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## Résumé

*Le positif au collodion sur plaque de verre, communément appelé « ambrotype », est dérivé de la « plaque humide » au collodion, un procédé dans lequel le négatif consiste en une émulsion photosensible à base de collodion appliquée sur une feuille de verre. Au lieu d'utiliser ce négatif pour produire de multiples images positives sur papier, on blanchit l'ambrotype même, puis on le monte devant une surface sombre pour produire une seule image en apparence positive. Cette méthode s'est révélée populaire de 1854 à la fin des années 1860. Cet article de fond passe spécifiquement en revue l'histoire de l'ambrotype, son évolution technique et sa diversité, pour mieux faire comprendre l'importance du procédé. L'auteur décrit les circonstances dans lesquelles l'ambrotype s'est imposé dans l'Ouest canadien. Il fait aussi état de considérations liées à la conservation.*

## Abstract

*The collodion positive on glass, commonly known as the ambrotype, is derived from the collodion "wet plate" – a process in which the negative consists of a collodion-based, light-sensitive emulsion coated on a sheet of glass. Rather than using this negative to produce multiple positive images on paper, the ambrotype itself was bleached, then mounted in front of a dark surface so as to produce a single, seemingly positive image. This method proved popular from 1854 until the late 1860s. This comprehensive paper specifically reviews the ambrotype's history, technical evolution and variety in an effort to give a better understanding of its significance. The author describes the circumstances of the ambrotype in Western Canada. Conservation concerns are also outlined.*

## Introduction

Few technical developments have had as pervasive an influence on society as that of photography since its inception in 1839. Daguerreotypy, named after its inventor, became the first practicable form of photography. The process produced a laterally reversed positive image directly onto a silver-coated copper plate. The mirror-like plate gave the image a luminous quality without graininess but could not be used to generate duplicates. Another process announced that same year, calotypy, allowed an unlimited number of positive prints to be produced from a single, paper negative. The factor of reproducibility gave the calotype a great advantage over its rival the daguerreotype and is the direct progenitor of modern photography. Nevertheless its paper support accounted for a graininess many nineteenth-

century photographers and critics found disturbing. Several efforts aimed at refining the image (some highly successful) did not prevent its slow demise. The introduction of glass-negative processes (the albumen-on-glass and especially the collodion-based processes commonly known as "wet plate" photography) supplanted all earlier photographic processes.<sup>1</sup>

The first decade of the wet collodion period witnessed numerous innovations. Among these was the introduction of the ambrotype. (Appendix A reviews the variety of ambrotypes.) The term is primarily a North American commercial term, patented in the United States but also used in England. Technically the process is correctly known by the specific British term "collodion positive on glass." This term also prevailed in Europe, although French literature referred to "daguerreotype sans miroitage"

(daguerreotype without reflection).<sup>2</sup> Early period literature also promoted "daguerreotypes on glass" to give a semblance of credibility to the photographer's gallery or studio. More often than not this also reflected the portraitist's misconception of the process.<sup>3</sup> Other colourful terms included "verrotype"<sup>4</sup> and "Archerotype."<sup>5</sup> For clarity the author uses "ambrotype" so as not to confuse it with other collodion positive processes (e.g., ferrotype, pannotype, see Appendix B).

Many daguerreotypists ignored the new techniques, arguing that the new processes were uncertain while the old process was well understood and could be reliably employed. Those who refused to change eventually left the business, but the majority joined the growing ranks of "photographers" and "ambrotypists." The popular use of ambrotypes in North America flourished from 1854 until after the Civil War, but isolated use persisted until 1880. A more or less parallel evolution happened in Great Britain but only until the mid-1860s. The Continent showed mixed interest from short-lived influence in France and German-speaking countries to popular use in Scandinavia. The wet collodion process, with all its drawbacks, travelled to the four points of the compass, and in turn brought the four corners of the world to the family circle; but the ambrotype derivative saw limited (though on occasion, exotic) use. As a general rule ambrotypes were no longer promoted by 1869 and there are few examples to follow after that. The photographic world had been caught up in yet another process.

### **Photographers: Professionals vs. Amateurs**

In general, the change to the collodion technology did not strongly influence the structure of the photograph production sector of the industry (the photographers); it simply presented new possibilities. (Within the manufacturing and jobbing sectors, the change had a more profound influence; however this is beyond the scope of the present article. Readers interested in this topic can read William Welling's *Photography in America: The Formative Years 1839-1900* cited in Note 1.) A quick survey of any photo-history book will indicate that conventional "wet plate" photography permeated through art and architecture while ambrotypes were generally relegated to portraiture. A common but wrong assertion

is that ambrotypes, by their inexpensive nature, proved popular only with cheaper portrait galleries and were "never made by some of the more fashionable establishments."<sup>6</sup> Certainly the collodion's lack of light sensitivity may have deterred its use in the early years. In later years the reasonably fast exposure times spurred studios to promote "good expressions" and encouraged patrons to "bring their children and babies" to be photographed.<sup>7</sup> The small print often required that sittings be done in mid-morning when natural lighting was at its best.<sup>8</sup> In 1858, the New York City Police Department, following the lead of the Criminal Investigation Department in Glasgow, Scotland, adopted the process to establish the first North American "rogues' gallery" containing filed images of wanted criminals and arrested persons.<sup>9</sup> During the American Civil War portraiture was important as never before in family life, and itinerant photographers in particular were enjoying a boom equal to that when photography was first introduced in 1839.<sup>10</sup>

Commercialization of photography in Britain, compared to this continent, was slow to come. The number of commercial photographers, most of them daguerreotypists, had increased only very gradually since the 1840s. There were no major entrepreneurs until the mid-1850s when patent restrictions were finally lifted and the wet collodion process all but replaced daguerreotypy.<sup>11</sup> "In the early 1850s the prestige of the amateurs, especially in contrast to that of the hack commercial portraitist who turned out collodion positives, remained high."<sup>12</sup> The upper- and upper-middle-class character of early photography changed as the field expanded. Class issues were at least implied in the decision by a number of people to withdraw from active involvement with the medium. Amateurs of the early 1850s had taken pains to distinguish themselves from operators who took ambrotype portraits.<sup>13</sup> Amateurs in Britain's Canadian colony seemed to follow the same attitude.<sup>14</sup> During the 1850s there was some feeling that those who worked with paper negatives were engaged in an artistic enterprise, whereas those working with collodion were not.<sup>15</sup> As for those who produced ambrotypes "these cheap inartistic images were anathema to sophisticated amateurs who felt that they gave photography a bad name."<sup>16</sup> A letter to the editor of the *Journal of the Photographic Society*, on 21 August 1855, called ambrotypes "photographic abominations."<sup>17</sup>

Whether in North America or in Europe there is no doubt that ambrotypes became a less expensive substitute for daguerreotypes. Photographic historians often relegate the use of ambrotypy to only “cheap” studios – no doubt prevalent – but research indicates many galleries made honest efforts and indeed produced excellent results. There is nothing cheap about the ambrotype of John A. MacDonald, ca 1857, who was then Attorney-General for Canada West,<sup>18</sup> nor the thoughtful pose of the woman seated obliquely to the camera (Fig. 1). Ambrotypes do indeed have a beauty of their own. They ushered in a new appreciation for photography based on the inexpensive availability of a quality portrait to the public.

### Development of the Collodion Positive on Glass (Ambrotype)

In 1847, the pioneering French photographer Claude Félix Abel Niépce de Saint-Victor, using the albumen of eggs mixed with silver salts, achieved a sensitized glass plate. His experimental albumen negatives, brilliant and rich in detail, permitted positive prints that far surpassed Talbot’s paper-negative calotypes.<sup>19</sup> While many photographers saw in calotypy’s lightweight paper negative the possibility of field trips without the problems caused by the weight and fragility of glass, many more were impressed by the clarity of detail possible with an on-glass negative. The albumen-on-glass negatives eliminated the visible texture and loss of detail caused by printing through paper-based negatives, but required anywhere from 5- to 15-minute exposures.<sup>20</sup>

By 1847, the medical world had learned about a tough, transparent membrane of fast-drying chemicals, which could be used as a means of covering and drawing together wounds and surgical incisions. Collodion was manufactured from nitrocellulose or cotton treated with nitric acid. Ironically, in the form of guncotton it was the precursor of dynamite. A simple mixture of guncotton soaked in alcohol with sulfuric ether found an even greater potential in photography.

In England, the sculptor Frederick Scott Archer took up calotypy as an aid to his work.<sup>21</sup> In an effort to improve the paper’s surface, he spread a solution of collodion on the paper; the collodion film did not properly adhere to it. Archer then decided to use the collodion as a substitute for the paper, and eventually to use it to bind photosensitive materials on glass –

thus inventing a collodion-based, light-sensitive emulsion coated on a sheet of glass. In Archer’s process, collodion containing potassium iodide was poured onto a glass plate, which was carefully tilted until an even coating was formed all over it. Sensitizing followed immediately by dipping the plate in a bath of silver nitrate solution. It then had to be exposed while still tacky (hence the common term “wet plate”)



**Fig. 1**  
*Portrait of woman facing obliquely to camera, ca 1855; in uncommon thermoplastic frame.*

because the sensitivity deteriorated rapidly as the collodion dried. (This is a function of the evaporation rate of the collodion’s ether.) Both development – with pyrogalllic acid or iron sulphate – and fixing had to be carried out immediately after exposure.<sup>22</sup>

Readily and inexpensively manufactured, collodion had proven itself a superb emulsion support. The problem lay in its practicability on glass.<sup>23</sup> The manipulation was reasonably complicated and since all operations had to be

done on the spot, the outdoor photographer was particularly burdened with a complete portable darkroom. Exposure, a function of the lens's rapidity as well as the size of the collodion plate, compounded the problem. Nevertheless in 1851, this new development so revolutionized glass-plate photography that it won over even the remaining enthusiasts of the on-paper system.



**Fig. 2**  
Ambrotype displaying  
the negative quality;  
backing partly removed.

Following the publication of *The Collodion Process on Glass* in 1851, Archer, in collaboration with fellow Englishman Peter Wickens Fry, worked out the direct positive on glass variation (i.e., ambrotype). Underexposed collodion negatives were bleached during the developer stage with mercuric bichloride or nitric acid. This produced a seemingly positive picture when viewed by reflected light against a black background<sup>24</sup> (Fig. 2).

Using Archer's published accounts photographer-experimenter Dr. Giles Landell of Boston procured "good collodion portraits on (black) paper" and called these "melanographs."<sup>25</sup> They are technically a collodion positive on paper. Archer's invention, given freely to the scientific world,<sup>26</sup> was patented in 1854 in the United States as the "Ambrotype" process by a Philadelphia daguerreotypist named James Ambrose Cutting. Cutting's patent protected the mechanical technique of sealing the image between two sheets of glass with Canada balsam. (It is therefore ironic that we identify the collodion positive process with the patentee rather than with the inventor who showed how collodion could be the carrier of light-sensitive chemicals.) The term "ambrotype" comes from the Greek word *ambrotos* meaning immortal or imperishable. It was proposed by Isaac Rehn, a painter-turned-daguerreotypist, who promoted Cutting's variant of the collodion-on-glass to Marcus Aurelius Root, who then suggested the term "ambrotype."<sup>27</sup> It is only coincidence that Cutting's middle name was Ambrose. The first mention of the ambrotype by name occurs in *Humphrey's Journal* for 1 February 1855, as part of the description of Rehn's work at the fair of the Franklin Institute in Philadelphia.<sup>28</sup> Cutting received one British and three American patents.<sup>29</sup> His British patent covered the term "ambrotype" and the use of Canada balsam. Ironically there are no confirmed British ambrotypes sealed with the Cutting method.<sup>30</sup>

### Ambrotypes in Canada's West

The introduction of photography into Canada's West is the result of a two-prong advance: eastern, government-led expeditions and independent photographers travelling westward; and migrant gold seekers heading eastward from the Pacific Northwest and neighbouring interior.

In the 1850s there was an increasing Canadian interest in the West. The Hudson's Bay Company's jurisdiction was coming to an end; American settlement was advancing westward. In 1857, the Province of Canada sent survey expeditions to establish an immigrant route between Lake Superior and the Red River Settlement. The following year government expeditions extended the survey further west to the foot of the Rockies to confirm Canada's expanding national border. Among the survey team leaving Fort Garry in 1858 was the young photographer Humphrey Lloyd Hime, who is

credited with producing the first successful expedition photographs in the West.<sup>31</sup> Undoubtedly cumbersome, the wet collodion process necessitated not only camera, tripod and glass plates, but also chemicals, a portable dark tent practical enough to travel by canoe, dog cariole or Red River cart! On location it was necessary to have at least a barrel of "clean" water, as almost invisible amounts of foreign matter in the silver nitrate bath would invariably result in a blank plate. The very lack of clean water ruined many of Hime's photos. The 1858 expedition supply records indicate a copy of T. Frederick Hardwich's indispensable *A Manual of Photographic Chemistry Including the Practice of the Collodion Processes*.<sup>32</sup> There was no intent to produce ambrotypes during these early government-sponsored expeditions. Hime's work, as well as other, later, expedition photographic results, clearly served to produce prints for a variety of publications.<sup>33</sup> It was not until the 1870s that various expeditions photographed the West again, but in the meantime other independent photographers travelled outwardly from the Red River Settlement.

The 1858 California gold rush and the 1861 Fraser River, British Columbia gold rush increased the demand for pictures as adventurers left for these distant Eldorados. Photographers were close behind. Stephen Allen Spencer, for example, arrived at Fort Victoria in 1858 and advertised as a "Daguerreian Artist" in 1859, but soon after called himself an "Ambrotypist and Photographer."<sup>34</sup> Advertisements offered patrons the opportunity to procure ambrotypes of sick and deceased friends<sup>35</sup> – an interesting social practice carried out on this continent. On 14 February 1860, *The Nor'Wester* (the first newspaper of the Canadian prairies, published 28 December 1859 until seized by Louis Riel in 1869)<sup>36</sup> had an advertisement for "The Red River Portrait Gallery." The "likenesses" that the photographer, A. Barnard, was willing to barter for wheat, flour or wood,<sup>37</sup> were probably ambrotypes. By winter the same gallery "had been refitted and offering ambrotypes, photographs, and melainotypes."<sup>38</sup> Another (itinerant) photographer, D. R. Stiles, offered similar selections in St. Boniface, while staying at the American House owned by Mr. Charles Cavilier.<sup>39</sup> In 1849, Joseph Langevin left Quebec to seek adventure and fortune. When the U.S. Civil War broke out, he served as an intelligence officer supplying information about Indian activities in the American Northeast. Somewhere along the way he apparently learned photography and by 1864

Langevin had set up his studio in the Red River Settlement "next door to Messrs. Higgins and Lyons."<sup>40</sup> *The Nor'Wester* appeared to have reviewed favourably his photographs (cartes de visite) and ambrotypes. Post-mortem images ca 1864–66 were also taken.<sup>41</sup> He expanded both to Fort Pembina and into the Minnesota Territory.<sup>42</sup> Several photographers worked in the



**Fig. 3**  
"Grandmother  
Rowland," n.d.,  
Provincial Archives of  
Alberta. 74.397/1.

Canadian West<sup>43</sup> during the "ambrotype era" and we know they used the wet-plate process. Hudson's Bay Company records indicate that some employees "adopted photography as a pastime" during this era.<sup>44</sup> We can only surmise as to who took the ambrotype of "Grandmother Rowland" in the late 1850s or early 1860s (Fig. 3).<sup>45</sup>

Whether established gallery owners or itinerants, few Canadian photographers used the wet collodion process other than for ambrotype

portraits before 1860. Paper photographs were taken in the 1850s: large prints or stereographs are indeed rare.<sup>46</sup> In established eastern centres the market for, and competition between, the daguerreotype and ambrotype was apparently fierce. Practitioners promoted the rapidity of their crafts, with daguerreotypists having a temporary edge.<sup>47</sup> Wet collodion photographers reported that it took 20 seconds of exposure time in a gallery under ideal conditions whereas (by mid-1850s) the daguerreotypist ordinarily required just 2 seconds.<sup>48</sup> Fresh emulsion provided speeds equal or close to that of daguerreotypy; however, with posing and other delays the wet plate dried, becoming slower in its response to light and even completely insensitive. In either practice there are few "candid" or "instantaneous" photographs<sup>49</sup> (Fig. 4). As a general rule, the larger the "plate" size, the longer the exposure – a function of the existing optical properties of the cameras.<sup>50</sup> The slow exposure precluded the need for a shutter mechanism. Photographers simply uncapped their lenses to expose the plate.

By the latter 1850s the ambrotype had superseded the daguerreotype in Canada both in popularity and convenience.<sup>51</sup> Canadian examples are unfortunately very hard to confirm as many were encased in either American-made papier-mâché, thermoplastic "Union" cases or frames, or European-supplied papier-mâché or leather cases.<sup>52</sup> The more important Canadian galleries occasionally stamped, or had their cases stamped with, the studio name but the author is unaware of this practice out West. Trade (business) cards, occasionally sandwiched inside the case, were often misplaced or lost. (These must not be confused with the case manufacturers' advert and patent notices.) Some studios pasted a small label directly on either the mat or preserver (Fig. 5) or a larger patch on the felt. The problem is compounded by itinerant photographers who chose not to protect their work in such cases. Understandably, unprotected (i.e., uncased) ambrotypes have a greater chance of being damaged or destroyed. It has been suggested that during the early years daguerreotype cases were used, but as ambrotypes became popular, cases were specifically made to accommodate the deeper, double-thickness glass (i.e., Cutting process).<sup>53</sup> The circumventing of the unpopular patent makes this doubtful (see Appendix A). Inspection of cases also does not confirm this nor has the author come across supporting period

literature. The author is aware of "Brady two-way open cases" manufactured to demonstrate the negative-positive (transmitted light-reflected light) nature of ambrotypes not coated with an opaque backing (see Appendix A, "aesthetic variations"). Insect infestation has always been a problem and a common reason for transferring images from one holder case to another, in several instances resulting in some damage.

By the early 1870s more light-sensitive gelatin dry plates travelled into Canada's West.<sup>54</sup> Most studio and itinerant photographers ceased to work with the old wet-plate technology. The pre-sensitized dry plates eliminated the need for awkward chemical procedures and the new sensitized papers all but ended the old chemical technology. The ambrotype had become outdated.

### Applied Colours – Rosy Cheeks and Healthy Appearances

From the moment the first image appeared the marvel of the new technology was tempered with the disappointment that nature's colours were not recorded. Almost immediately various methods were developed to mimic real colour.

Collodion-on-glass images were considerably easier to hand colour than were the daguerreotypes.<sup>55</sup> The ambrotype's collodion accepted a variety of dry and wet materials. For a fee, the ambrotype could be coloured by an artist or the photographer himself, who would apply either dry powdered pigments, or oil- or water-based paints, to the underlying monochromatic image.

Very few present-day photography books discuss these application techniques. One must rely on period literature for details; among them *The Photograph and Ambrotype Manual* (1858) by N.G. Burgess of New York<sup>56</sup> or *Harmonious Colouring as Applied to Photography* (1859) by James Newman of England.<sup>57</sup> Dry pigments were carefully applied onto the collodion. The excess was gently blown away with a fine rubber air bulb and a suitable transparent varnish was applied. Once the varnish was dry, extra colour could again be applied.<sup>58</sup> "Wet" colours, that is, oil- and water-based paints, required some knowledge in colour. Simply mixing the colours to the desired hue and then washing them onto the collodion rarely ended in success. The photographer had to remember that in some instances the collodion gave a "base" colour (e.g., apply pink to a grey base and you get purple). The end result



**Fig. 4**  
*The Card Players,*  
*J. Turner's Cheap Gallery,*  
*Toronto, Canada.*  
*Example of staged,*  
*studio portrait. (Courtesy*  
*Sam Smith, Calgary*  
*Photographic Historical*  
*Society)*

was strictly a function of the artisan's expertise and hand. Jewellery (loketts, necklaces, brooches, etc.) were invariably painted over with gilt. In several examples jewellery is painted in where none existed! Both "dry" and "wet" paints were available in a variety of kits.

To protect this handiwork, many photographers chose to apply clear varnishes over the hand-coloured collodion. Clear varnishes were based on natural gums such as copal, demmar and amber, which did not require plasticiz-

ers.<sup>59</sup> For the itinerant photographer such varnishes became economical substitutes for the protective holders and frames.

To bring out the "positive" aspect, the photographer gave the glass plate a final dark lacquer or inserted dark paper, metal or fabric directly to the collodion surface or directly to the reverse side. On occasion one notices the use of the "relievo process" (Fig. 6) (see Appendix A for explanation and variants).<sup>60</sup> A vast majority of ambrotypes are found encased.

With few exceptions excellent results came from established studios while the itinerant ambrotypist rarely coloured the image or produced garish results. Ambrotypes on ruby glass have occasionally faint colouring – mostly on facial features – but with mixed results. On rare occasions ambrotypes are found with applied colours to the reverse (non-collodion) surface of the glass, and care must be taken not to accidentally remove them. If painted on the backdrop, these colours produce interesting pseudo-stereoscopic effects. If the colours are painted on subjects, particularly the facial features, the results are awkward.<sup>61</sup>

### A Brief Comment About Care and Preservation

It is not the purpose of this paper to discuss conservation, however readers should be made aware of some concerns.<sup>62</sup> Preservation of any item is essential for future generations to enjoy. The pros and cons of any type of treatment should always be considered beforehand. Traditional conservation standards mandate that nothing be done to a piece that might damage

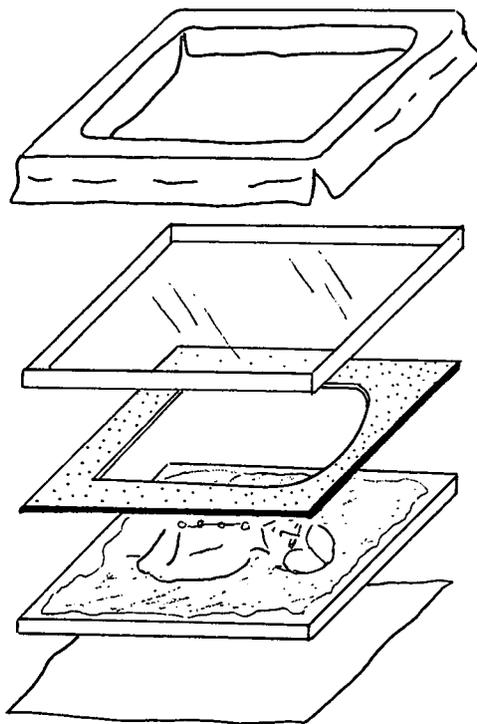
or alter it. Ideally, a treatment should be reversible, that is, you should be able to undo it without damaging the image. This begins with the very act of removing the image from its casing. Readers of care and restoration literature should remember that while much research has been carried out, particularly this past decade, some practices described in even recent publications are outmoded or questionable. “Revarnishing” the back of ambrotypes with black lacquer is a perfect example of an ethical problem. “Rewaxing” a protective case is another. When trying to come to a qualitative judgement about ambrotypes, it is important to examine as many as possible. If in doubt, contact an experienced conservator.

The emphasis should be on the identification of problems, common-sense care and basic preservation techniques, including documentation – a topic often neglected or ignored entirely. Cleaning and restoration require a hands-on approach under controlled supervision and all artifacts should be handled with lint-free, non-slip gloves. The author suggests that a photographic copy of the original be made as early as possible. Surrogate images are the safest materials. They can be handled with less concern, and if destroyed a new copy can be made from the stored negative.

### Conclusion

Until recently, nineteenth-century photographs mostly mouldered away in attics and antique shops. Today collecting old pictures is as popular with museums as with private collectors—and with good reason. Old photographs provide rare visual documentation of a country growing up. There is great satisfaction in discovering or identifying important material relating to western Canada. The interest in old photographic techniques has in the past 15 years created a “modern” revival in their processes. Daguerreotypes, ambrotypes and “tin-types” have all been produced. These create fascinating results with a contemporary view of photography. Some images are surfacing, however, with a clear intent to deceive the public and unknowledgeable collectors. It is almost impossible to “fake” sites in Alberta (in part due to relatively recent exploration and the total absence of the early forts and other structures), but the eastern half of North America has fallen prey to unscrupulous dealers. Caution is advised, particularly where provenance is sketchy about images “too good to be true.”

**Fig. 5**  
Exploded view of an ambrotype assemblage. Top to bottom: “pinch beck,” cover glass, mat, ambrotype (collodion facing viewer), paper backing. Protective case not shown.





Ambrotypes are clearly underrated and those with occupational or thematic subject matter should be avidly sought. Those proven to represent early prairie work must be located. The question is, where have they gone? The ambrotype of "Grandmother Rowland" taken at Fort Edmonton is presently the only confirmed prairie example (Alberta region) to the author's knowledge. Considering the large numbers of ambrotypes extant in western Canada, greater research must be carried out to check for clues attesting to their provenance. There has been extensive research on a photographic predecessor, the daguerreotype, and on the dry plate, which followed wet collodion imagery. It is time we paid attention to the use of ambrotypy on the Canadian plains.

### Acknowledgement

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**Fig. 6**  
Example of relievo process, front and back view of plate. Only the figure is outlined and backed to bring out the positive aspect. Note crazing of varnish.

## Appendix A Varieties of Collodion Positives on Glass (Ambrotypes)

### a) Ambrotypes on plain glass, with "backing" on emulsion (collodion) side

Backing can be any of the following: 1) black varnish; painted directly on emulsion; or on a second pane of glass (Rehn); 2) velvet (dark colours, mainly black, though mauve and blue have been observed); 3) black paper or cardboard; 4) metal sheet or foil, painted black.

No specific dates (1854 to ca 1870). Comprises the majority of ambrotypes found. The process existed in several variants. Depending on the chemical treatment, the image colour can range from the normal creamy colour to a silvery white or even to a snow-white – a result known as alabastrine. Conventional gradations of the collodion include white to silver to light grey to dark grey to "pale" black. The collodion itself may or may not be protected with a transparent lacquer. (N.B., if backing is on collodion side then the image is laterally corrected for viewing. However, to improve "viewing" and to bring out detail, many photographers preferred to reverse the image and varnished the non-collodion side.)

Other "aesthetic" variations include the following: 1) relievó process, ca 1854, by Urie, British; revived by T. C. Lawrence in 1857; due in part to the popularity of stereo pictures. Only the subject matter, collodion side, is varnished black; the rest of the emulsion may or may not be scraped off; 2) white (see "white ambrotype" below), coloured or painted backing papers are set behind the plate; on rare occasions a domed cover glass is substituted to further enhance the relief aspect (compounded by the collodion's shadow casting to the backing, if collodion nearest to viewer); 3) lampratype, by S. A. Holmes, American; "strategic" buffing of collodion surface with an oiled/greased buckskin or similar material imparted a sheen and contrast to the pale and dark tones—the transparent areas became clearer, the highlights denser. A fine brush or camel's hair pencil was used to accentuate details. The collodion may or may not be shellacked with textile material adhered to it.

To demonstrate the negative-positive (transmitted light-reflected light) appearance the image is sometimes found in "double-case" or "Brady two-way open case." This will only apply to images without the varnished backing.

### b) Ambrotypes on plain glass but collodion sandwiched by second clear glass permanently secured to collodion with balsam of fir (Canada balsam) (better known as Cutting process)

Based on American patent obtained in 1854 (shortlived, until 1858, circumvented by several patent objectors); derivatives include "improved ambrotypes"; varnish applied to collodion side, backing on same side; also "Simmons variation" whereby any varnish other than balsam of fir is used.

All "Cutting" ambrotypes and variants are prone to air bubble inclusions when the two glass plates are cemented together. (Careful not to confuse with gas inclusions on glass plate proper.) Unless chemical tests are carried out it is impossible to determine which variant is present.

### c) Ambrotypes on ruby or coral glass (term used interchangeably for either deep red, mauve or burgundy glass; on rare occasions "bottle" brown; beginning ca 1857, used sporadically until 1870); also on blue "Bristol" glass (England only, rare)

These ambrotypes required no backing as the glass was already very dark; sometimes found in "double case" or "Brady two-way open case," the viewer would point the case toward any light source and see (usually) deep red background with a "negative" image. A variant: background is scraped away leaving only the subject (but is not relievó).

### d) Ambrotypes on plain glass, with a "white" (painted or paper) backing

Known commercially as "white ambrotype," only the shadow areas (i.e., portrait or subject matter) of the collodion are saved; the rest of the collodion (i.e., the backdrop) is scraped away; a full white backing is used, providing the effect of a photograph on milk glass; this is a variation of relievó process.

*The author advises against the use of "single-glass" and "double-glass" terminology. It conveys an inaccurate description. For example, a Cutting-process ambrotype protected by a cover glass would incorrectly be called "double-glassed" but "single-glassed" if missing a possible cover glass. A Rehn-process ambrotype having lost its glass backing but still with a cover glass would be termed "double-glassed" whereas it is a "single-glassed" ambrotype. There is no consistency.*

## Appendix B Other Wet Collodion Positive Derivatives

**Ferrotypes:** wet collodion (and later, gelatin emulsion) coated on a sheet of black-japanned iron; popularly known as "tintype"; other names include melainotype, ferrograph, lettertype, lettergraph; introduced ca 1854, its greatest popularity was in isolated spurts (1856–75, 1890–1900, 1920–30s, still produced today in various parts of the world, more as a curiosity); cheap, sturdy and quick to produce; pre-1870 "grey" tones (those stamped with patentees' names and dates are early plates), post-1870 "chocolate" tones; came in a variety of sizes from "Gem" to "full" plate; most in a variety of "Potter" patent cards (generally Civil War era) or similar, later paper and cardboard holders; has often been called the "poor man's daguerreotype" and occasionally encased in the various papier-mâché, leatherette or even thermoplastic cases; commonly found in cartes de visite albums.

**Pannotype:** wet collodion on dark leathers; sometimes known as "patent leather process"; primarily experimental processes used by French tanneries but never picked up by the European photographic community; ca mid-1850s; isolated attempts with use in the postal system "less likely to be damaged in the mail"; the leather was usually held in place by a piece of tin; leather-collodion inconsistency reaction often cracked; very rare; other variants included the use of oil cloth, and black waxed cloth – the latter used almost exclusively by lower class or itinerant French photographers before 1859; H. L. Smith, American promoter of the "melanotype," 1856, also discussed collodion on leather and other fibrous materials but did not apply for patent rights to the latter two.

**Melanograph:** wet collodion on black or blackened paper ca 1854, experimental use; some literature mentions "black waterproofing coating on paper"; no apparent commercial use until the mid-1900s "tintypes on paper" factory-coated emulsion on black paper (by then a gelatin emulsion); resurgence mid- or late-1930s dry collodion monobath process then known as "atrographs" (England); often in framed cards; visually similar to ferrotypes but are lightweight and non-magnetic since paper-based.

**Hallotype:** magic lantern pictures on glass and glass positives.

**Amphitype:** paper process announced in 1844 by Sir John Herschel; this process could produce either negative or positive pictures according to manipulation. Exposure varied from a half-hour to six hours (not to be confused with similarly named but different process ca 1851 by Talbot). Rare, and unknown in North America.

**Atrephograph:** a silver nitrate negative image formed on a skin of collodion on glass that had first been coated with India rubber dissolved in chloroform. After fixing and washing, the image-bearing transparent skin was rolled off the glass support and then adhered to thin cards or polished, japanned leather. The image was viewed as a positive "unreversed" image (i.e., laterally incorrect).

*A variety of collodion positive images have been produced either directly or by transfer from their glass base onto other materials including enamel, porcelain, artificial ivory (1855–90). The methodology is mostly unrecorded in western Canada; however such artifacts have been introduced through family belongings.*

## NOTES

1. Readers must not confuse the albumen negative process with the highly pervasive albumenized paper positive print. Neither is it uncommon to confuse daguerreotypes and ambrotypes. Recommended reading includes Gordon Baldwin, *Looking at Photographs. A Guide to Technical Terms* (Malibu and London: The J. Paul Getty Museum in assoc. with British Museum Press, 1991); Brian Coe and Mark Haworth-Booth, *A Guide to Early Photographic Processes* (England: Victoria & Albert Museum/Hurtwood Press, 1983) and William Welling, *Photography in America. The Formative Years 1839-1900* (Albuquerque: University of New Mexico Press, 1978, reprinted 1987). Readers interested in the technical aspects of the cameras should consult Brian Coe, *From Daguerreotype to Instant Pictures* (Gothenburg: Crown Publishers, Inc., 1987).
2. Thomas Feldevel, *The Ambrotype, Old and New* (Rochester: Graphic Arts Research Center, Rochester Institute of Technology, 1980), 7; no doubt in part to "remind" England that Daguerre had "invented photography."
3. *Ibid.*, 6; this is no surprise, as many studios combined photography, phrenology, dentistry, blacksmithing or other styles of business.
4. O. H. Mace, *Collector's Guide to Early Photographs* (Radnor: Wallace-Homestead Books Co., 1990), 30; trade name coined by Lanes Photographic Gallery, Brighton, England.
5. *The Silver Image*, exhibition booklet (Saskatoon: Mendel Art Gallery, 1979), 29.
6. William Welling, *Collector's Guide to Nineteenth-Century Photographs* (New York: Macmillan, 1976), 5. Particularly unusual applications are the Victorian perfume bottle with an image of a man on one face, and the brooch with "ambrotype of grinning boy with dog" mentioned in *Schroeder's Antique Price Guide* (Paducah: Schroeder Publishing Co. Inc., 4th ed., 1986), 422. More common are copies of miniatures and of paintings (author's private collection).
7. Peter E. Palmquist, "Carleton E. Watkins: A Biography - Chapter 4 - From Babies to Landscapes 1856-1858," 227-246, in *The Daguerreian Annual 1991* (Eureka: Eureka Printing Co., 1991), 229; advertisement in the San Jose Tribune, 5 March 1856; also Michel Lessard, *The Livernois Photographers* (Quebec: Musée du Québec/Crown Corp., 1987), 82, Fig. 52.
8. E. M. Estabrooke, "The Glass Room," chapter IV, *The Ferrotypes and How To Make It* (Hudson: Morgan & Morgan Inc., 1872, 1972 facsimile), 38-61, reviews exposure, lighting, and floor plan suggestions. Albeit re: ferrotypes the information applies equally well to ambrotypes.
9. Robert Taft, *Photography and the American Scene. A Social History 1839-1889* (Mineola, N.Y.: Dover Publications, Inc., 1938, reprinted 1989), 127; also, Charles R. Gibson, *The Marvels of Photography* (London: Seeley, Service & Co., 1919), 58, plate "Early Photograph of Criminals, positive on glass, [Frederick] Scott Archer." The particular ambrotype must predate Archer's untimely death in 1857.
10. George Gilbert, *Photography: The Early Years* (New York: Harper & Row, 1980), 52; Ralph Greenhill, *Early Photography in Canada* (Toronto: Oxford University Press, 1965), 33. Canada was no exception, the Civil War brought untold boom to Canadian photographers Greenhill, 42. Ironically Quebec City lost importance after 1865 when it no longer was the seat of government for the Province of Canada.
11. H. J. P. Arnold, *W.H.F. Talbot. Pioneer of Photography and Man of Science* (London: Hutchinson Benham Ltd., 1977), 195; in part from the British industrial expansion, portrait studios rose from 12 to 66 (1851-55), and 66 to 200 (1856-61).
12. Grace Seiberling and Carolyn Bloore, *Amateurs, Photography and the Mid Victorian Imagination* (London: University of Chicago Press, 1986), 75. By 1860 calotype negatives were still used by amateurs, in contrast to collodion negatives, which were used by the ever-growing number of professional and commercial photographers.
13. *Ibid.*, 99.
14. Lilly Koltun, ed., *Private Realms of Light. Amateur Photography in Canada 1839-1940* (Markham: Fitzhenry & Whiteside Limited, 1984); in fact ambrotypes are never even discussed as a process used by the amateurs.
15. Seiberling and Bloore, *Amateurs*, 30-31.
16. *Ibid.*
17. *Ibid.*
18. Greenhill, *Early Photography in Canada*, plate number 6, unpagged (76).
19. Gilbert, *Photography: The Early Years*, 39.
20. Welling, *Photography in America*, 68.
21. Arnold, *W.H.F. Talbot. Pioneer of Photography*, 195; one of the many examples of interdisciplinary uses of photography.
22. B. Newhall, *The History of Photography from 1839 to the Present Day* (New York: Museum of Modern Art, revised and enl. ed. 1964), 47-48; the various steps, from the cleaning and polishing of the glass plate to its development and drying, are capsulized. Richard Huyda, *Camera in the Interior: 1858, H.L. Hime Photographer, The Assiniboine and Saskatchewan Exploration* (Toronto: Coach House Press, 1975), 37-45; gives detailed procedures endured by the field wet plate photographer. Readers should also consult Ian Moor, "The Ambrotype-Research into Its Restoration and Conservation," *The Paper Conservator*, vol. 2 (1977): 38-40, and

- Feldvebel, *The Ambrotype, Old and New*, 11–23. Both discuss the chemistry, making, preparation and modern photography with wet collodion.
23. Archer had also suggested an alternative procedure, one in which the collodion skin would carry the exposed and developed image and could be peeled away from the glass plate (thereby enabling a single plate of glass to be used repeatedly in the field). Few photographers were interested in the idea; most were content to enjoy the benefits of a negative on glass based on a collodion emulsion and a follow-up albumenized paper print.
  24. Helmut Gernsheim, *The Rise of Photography 1850–1880. The Age of Collodion* (New York: Thames and Hudson, Inc., 3rd rev. ed., 1988), 26. Any thin negative on glass [or film] will exhibit this phenomenon even without a special bleaching process – something Sir John Herschel had already demonstrated in 1840. Slightly underexposed or underdeveloped negatives gave best results, as a film of greater density tended to detract from the positive effect.
  25. *Ibid.*, 28.
  26. Arnold, *W.H.F. Talbot. Pioneer of Photography*, 195. Archer lived and died a poor man. The 13 June 1857 issue of *Punch* summoned “the Sons of the Sun [photographers] ... to be almost as sensitive as the collodion, ... not be negative” in an effort to raise money for his widow and children.
  27. Taft, *Photography and the American Scene*, 125.
  28. *Humphrey's Journal of the Daguerreotype and Photographic Arts*, vol. 6 (1855): 312.
  29. Feldvebel, *The Ambrotype, Old and New*, 49; U.S. patent no. 11,213, July 4, 1854, covered the use of camphor in collodion; no. 11,266, July 11, 1854, the use of bromides (accelerator) in collodion; no. 11,267, July 11, 1854, the “Ambrotype Patent” covered the use of Canada balsam. Taft, *Photography and the American Scene*, 124; English patent (number not listed), 26 July 1854, concentrated on the sealing method (using Canada balsam).
  30. Gernsheim, *The Rise of Photography*, 26.
  31. Greenhill, *Early Photography in Canada*, 50; Christopher Jackson, *With Lens and Brush. Images of the Western Canadian Landscape 1845–1890* (Calgary: Glenbow-Alberta Institute, 1989); provides concise information on the early and subsequent exploration of the Prairies. Early expedition accounts into western Canada include the following: Henry Youle Hind, *Narrative of the Canadian Red River Exploring Expedition of 1857 and of the Assiniboine and Saskatchewan Exploring Expedition of 1858* (two volumes in one) (Edmonton: M.G. Hurtig Ltd., 1971 facsimile of 1860 copies); Henry Youle Hind, *North-West Territory. Report on the Assiniboine and Saskatchewan Exploring Expedition* (Reports of Progress; Together with a Preliminary and General Report on the ...) (Toronto: John Lovell [printer], 1859); Richard Huyda, *Camera in the Interior: 1858*. It is sometimes confusing to read the literature on the boundary surveys conducted in 1858–62 and 1872–75, since both involved the Corps of Royal Engineers. The first was known as the British-United States Boundary Commission (1858–62) and the second, which involved the British, Canadian, and American governments, as the North American Boundary Commission (1872–75).
  32. Richard Huyda, *Camera in the Interior: 1858* (unpublished docent notes, n.d., Glenbow Museum), 3–4.
  33. Reproducible, multiple, salted paper and albumen prints were made from the conventional glass negatives; Christopher Jackson, *With Lens and Brush*, 77: results from the Canadian expeditions included publications with chromoxylographs and watercolours based on photographs or actual separate photographic portfolios. The ambrotype was nevertheless used consistently to obtain source material for influential publications, among them *Frank Leslie's Illustrated Newspaper*. Taft, *Photography and the American Scene*, 126, notes that in 1856 the same newspaper based 81 per cent of its illustrations on ambrotypes. Jackson, *With Lens and Brush*, 79, points out that it and other publications served both the American and Canadian markets, carrying reports and images from the Canadian West.
  34. Greenhill, *Early Photography in Canada*, 53; *The Canada Directory of 1857–58* listed “ambrotypists and photographer” though it also pointed out their other professions, including “civil engineers” and “draughtsmen.”
  35. *The Canada Directory 1857–1858*, advertisement, 1485; occasionally the deceased were physically transported to the studio! Most photographers, though, went to the home.
  36. *The Nor'Wester* (Winnipeg: Man. Dept. of Cult. Affairs and Historic Resources, 1981), pamphlet, 13.
  37. Ralph Greenhill and Andrew Birrell, *Canadian Photography 1839–1920* (Toronto: Coach House Press, 1979), 85. A “paperless” image offered less problems of manipulation and extra supplies to the “itinerants.”
  38. *Ibid.*, 85. The reader must be careful to understand that “photographs” refers to “wet plate” collodion results on paper; “melainotypes” refers to the “tintypes.” See Appendix A, this article. A reference in Hugh Dempsey's *Nineteenth Century Photographers in the Canadian Prairies*, draft 1978, Glenbow-Alberta Institute, is intriguing: “*Nor'Wester*, September 28, 1860. A traveller on the steamboat Anson Northrup met Barnard and commented ‘I was glad to find that the latter had with him his *ambrotype*

- instrument for taking illustrations of Indian costumes and Indian Councils.'" There is no evidence Barnard eventually took such images and, if these are indeed ambrotypes, their present location is unknown.
39. Greenhill, *Early Photography in Canada*, 51.
  40. R. Huyda, "Joseph Langevin Photographed Louis Riel," *Canadian Photography* (June 1976): 29.
  41. *Ibid.*
  42. *Ibid.*
  43. Greenhill, Greenhill and Birrell, Jackson, and Koltun all discuss other wet plate photographers: e.g., H. L. Hime ca 1857, Sask.; G. R. Fardon ca 1858, Fort Victoria; R. Roche (an amateur) ca 1858, west coast and San Juan Island; F. G. Claudet ca 1860, Eskimault and New Westminster; F. Dally 1862, Caribou and Barkerville; Mrs. R. Maynard 1862, Victoria; C. Gentile ca 1863, Leech River and "upper country" (near Caribou); B. R. Ross ca 1863-64 Mackenzie River District; C. G. Horetzky 1864-69, Moose Factory.
  44. Koltun, *Private Realms of Light*, 10; sadly enough only five employees avidly applied their knowledge (technically as amateurs) to photograph forts, local natives and surroundings between 1860 and 1870.
  45. Brock Silversides, in personal communication to author, 12 March 1992.
  46. Greenhill and Birrell, *Canadian Photography*, 47. Itinerant photographers especially used the ambrotype, which prevented the delays and inconveniences of paper pictures. It was, however, not unusual for ambrotypes to be copied or enlarged on paper.
  47. Lessard, *The Livernois Photographers*, 58; well established daguerreotypists since the mid-1840s began making ambrotypes as early as 1854. No Canadian prairie photographer is known to have produced daguerreotypes, choosing the relative convenience of the "wet plate" technology.
  48. Taft, *Photography and the American Scene*, 127.
  49. *Ibid.*, 127-129. Previously used in daguerreotypy, the use of bromide (and other chemicals) greatly increased the sensitivity of the collodion, thereby reducing exposure time; also Welling, *Photography in America*, 197, reviews the U. S. Patent Office's error in allowing Cutting's patent. In later years the Patent Office refused to renew the patent in favour of his heirs since it should have never originally been granted.
  50. Rudimentary "washer" diaphragms (placed in front of the lens to control light and depth of field) increased the required exposure time. A smaller plate (in reality a smaller camera) generally required less exposure time because of the shorter distance between plate and lens. P. Maurice, "Sizes of Daguerreotypes and Ambrotype Plates" in *Photographic Canadiana*, vol. 14, no. 4 (1989): 15; dimensions of early photographs were referred to in terms of "plate" size rather than inches or millimetres. Half plates measure roughly 11 cm x 16.5 cm, full plates 16.5 cm x 21.5 cm.
  51. Greenhill and Birrell, *Canadian Photography*, 43.
  52. Often incorrectly labelled "gutta-percha cases" the "Union" case was made of heat-molded and press gums, fine sawdust and assorted dyes. These intricately designed protective cases sold briskly in studios and galleries throughout this continent. The pressed papier-mâché and more beautiful mother-of-pearl cases continued to sell because of their inexpensiveness. Frames (either "leatherette"-covered wood, or fine thermoplastic) are less common. See P. Maurice, "Thermoplastics: A Brief History of One Union Case Manufacturer," in *CPHS Newsletter*, vol. 2, no. 4 (1988): 9-11.
  53. Mace, *Collector's Guide to Early Photographs*, 30.
  54. Dry collodion plates, commercially introduced ca 1856 in Europe, were less light sensitive than the wet collodion and never became widely popular. "Dry" is a misnomer since the process involved the use of a hygroscopic ingredient (e.g., honey, grape sugar, albumen or gelatin) to keep the plate in a moist state. The author is unaware of their use in Canada. The factory-prepared gelatin dry plates (introduced ca 1871) produced excellent and consistent results. These were quickly brought into Canada.
  55. P. Maurice, "Daguerreotypy—A Concise History of Methodology," in *Calgary Photographic Historical Society Newsletter*, vol. 2, no. 2 (1989): 5-12.
  56. Taft, *Photography and the American Scene*, 474, note 145.
  57. Brian Coe, *Colour Photography. The First Hundred Years 1840-1940* (London: Ash & Grant Ltd., 1978), 8.
  58. Ian Moor, "The Ambrotype - Research into Its Restoration and Conservation," in *The Paper Conservator*, vol. 1 (1976): 22-25; vol. 2 (1977): 36-43. Moor discusses the application of applied powdered pigments in "Part 2," 38.
  59. Moor, *The Paper Conservator*, vol. 2, 38.
  60. Authors like L. E. Keefe and D. Inch, *The Life of a Photograph* (Boston: Focal Press, 2nd ed., 1990), 328, are wrong in affirming that any image found with its collodion surface facing the backing is improperly (re)mounted. The ambrotype image may have been purposely reversed to be viewed laterally correct. A plate with the collodion facing the viewer presents a laterally incorrect position but it allows for clarity and picture detail. It may, however, also emphasize excessive applied colouring, smudges, etc. Nevertheless many (but certainly not all) photographers chose to use this mounting position. Viewing any ambrotype through its glass support as well as any cover glass reduces brightness and picture detail. Though

it would be laterally correct, most photographers preferred to avoid this problem, so the image was reversed. Whether such inversion occurred or not depended on preference or the method of mounting. To identify correctly the collodionized plate from its sealed protective pane on ambrotypes based on the Cutting process (see Appendix A) look at the position buttons and shirt holes or any lettering, etc.

61. The concept of stereography predates photography but became such a pervasive part of it that one stereocard manufacturer boasted that "no home was without" its viewer and stereographs.

Relievo ambrotypes, introduced in the mid-1850s, gave the viewer a semblance of relief and depth. On rare occasion this was enhanced with a domed cover glass to accentuate the effect. See Appendix A. True stereoscopic ambrotypes were briefly produced between 1854-60. For a full history, read William C. Darrah, *The World of Stereographs* (Gettysburg: private printing, 1977).

62. Readers interested in conservation concerns can read Philippe Maurice, "Book Reviews: Preventive Care, Conservation," *Timexposures*, vol. 5, no. 2 (1992).