

History of Photography

It is not our aim to describe here the complex development of the science of photography in its entirety, there are a great number of books available on that subject. It is necessary however, to have some understanding of the basic developments in the field of photography, if we are to understand the circumstances under which historic photographs were made. This brief outline will give the general background, rather than minute details, of the chemical/mechanical aspects of picture taking.

The camera existed long before the first photograph. The Camera- obscura was a device that captured light and produced a focused image. Initially working on the "pinhole" principal, and later incorporating lenses, these early box cameras were used by artists, who could trace the images to create drawings with accurate perspective.

The first commercially successful photographic processes were based on an amazing property of silver nitrate, a chemical that turns from a light silvery gray to black when exposed to light. This strange property was observed long before the first photographs were made. Some experimenters reasoned that a sheet of paper, glass, or other material, coated with silver nitrate and exposed to light and shadow would develop an image as the parts of the silver nitrate exposed to light turned black. The only problem was, when such an image was brought out into the light to look at it, the parts of the silver nitrate that had not been exposed to light soon turned black, eradicating the image.

There have been arguments among photography historians as to who first discovered how to fix the image, to keep it from fading, but there is no argument that it was Louis J. M. Daguerre who first made public such discoveries, in 1839 in France. William H. F. Talbot almost immediately announced his own, quite different process, in England. Both had discovered ways to wash away the unexposed silver nitrate, leaving only the dark, exposed image.

In **Daguerre's** process, the product of which soon came to be called a daguerreotype, a silver plated copper plate was polished to a mirror sheen. After being treated with chemicals to produce a light sensitive surface, the plate was exposed in a camera, then further treated to fix the image. Thus, a one of a kind image was created directly in the camera. Although it is actually a negative image (and hence laterally reversed), the daguerreotype appears positive when held at the proper angle, so that the mirror-like background reflects a dark surface, leaving the silver nitrate image relatively lighter. These images are the sharpest and clearest of any old photographic method. The French government purchased the rights to this process from Daguerre, and gave it freely to the world.

Talbot's process, called the talbotype or later refined as the calotype, was much more like the process we would recognize today. Talbot used silver nitrate salts in a solution. A sheet of paper was soaked in the solution, then exposed in the camera and treated to fix the image. This produced a negative image, which could then be reproduced indefinitely by placing the negative on top of another sensitized sheet, and shining light through the negative. The dark portions, where light had turned the silver nitrate black, blocked the light, and the lighter portions transmitted the light, creating a positive image on the copy. Talbot patented his process, and sold the rights to others wishing to make pictures. Because of the paper base used in the negative, the image produced by this process was much less sharp than the daguerreotype, and due to that fact, together with the additional expense created by the licensing process, this method was much less popular than the daguerreotype, especially outside of England.

The next major development was the introduction of the glass plate negative, which used a coating of colloidian to hold the silver nitrate on the surface of a glass plate. The clear glass overcame the fuzziness of the calotype, and still allowed multiple copies of each picture, using the glass plate

negative to make paper prints. Introduced in 1847, by 1860 this was the dominant method of photography in use. The plate had to be used immediately after the colloidion was applied, before it dried, so this process was known as wet plate photography.

In 1854, an offspring of the wet plate method was introduced to compete with the daguerreotype, the new form being called an ambrotype. In this process, a glass plate was again used. By mounting the negative image in a case with a black backing, it could be viewed as a positive image. This form was quite popular from 1855 to about 1870.

The tintype was introduced in 1856. Here, the photographic emulsion - the material carrying the unexposed silver nitrate - was spread thinly over the face of a thin plate of tinned iron that was "japped" to blacken the surface before the emulsion was applied. The practical effect was similar to the ambrotype, the black background making the negative image appear positive. The tintype could be produced very inexpensively, and was much more sturdy than the ambrotype, so this method continued to be used until about 1900.

The next major development in photography was the "dry plate" negative, which made picture taking much less cumbersome. A colloidion dry plate was invented in 1855 and used commercially between 1864 and 1880, but it never became very popular. The gelatin dry plate was invented in 1871, and by 1880 supplanted not only the colloidion dry plate, but the old colloidion wet plate as well. These convenient dry plates continued in use until about 1920 when they were replaced by the plastic based films.

There were through these years a number of developments in the types and characteristics of papers used to print photographs from glass plates. The salted paper, in which regular paper was impregnated with sodium nitrate and silver salts to form silver nitrate, was used from 1839 (this was the kind of paper Talbot used) into the 1860's, though with diminishing popularity. It was replaced by coated papers, where the paper served as a backing for a sensitive emulsion, much as glass served to hold similar emulsions for negatives. In albumen Paper, the emulsion was made from egg whites, which were found to be a suitable medium in that it held the silver nitrate evenly dispersed, adhered to the paper well, and dried clear. Invented in 1850, the albumen paper soon replaced salted paper and continued in use until about the turn of the century, when it in turn was replaced, this time by bromide paper.

Other papers were tried and enjoyed some limited success, but because of greater expense or difficulty of use, they were never widely used. Carbon prints were developed as early as 1855, and continued in sporadic use until modern times. Because of the difficulties involved in their use they are more often found among "art" photographs than in general use. Instead of relying on the photosensitive characteristics of silver nitrate, carbon prints used a gelatin emulsion that hardened slightly when exposed to light. After exposure the paper is washed in running water to remove the softer gelatin, leaving the image. The gelatin was usually colored with lamp black (carbon) which gave rise to the name. Platinum paper is similar to silver nitrate papers, except platinum replaces the silver, creating a different tone in the image and increasing greatly the expense of the paper.

Prior to the turn of the century the papers used in photography were generally very thin. These pictures were usually pasted onto cardboard mounts to make them more durable and to prevent curling. The size and character of these mounts offer some clues to the age of a photograph. They are important too because many photographers printed the name and address of their business on the backs, providing more clues to the provenience of the pictures attached. Occasionally, thoughtful owners even wrote identifying information on the back of these.

Stereo photographs were introduced in 1849 and became popular in Europe by 1854 and the U.S. by 1858. These consist of two photographs mounted side by side, showing the same subject from just slightly different perspectives, so that when viewed through a "stereoscope" the image appears three dimensional. There were stereo daguerreotypes, ambrotypes, etc., but these are rare, the vast majority of surviving stereoviews being card mounted prints. Stereo photographs continued to be popular well into this century.

The hyalotype, a glass plate positive, was developed in the 1850's, but it was not until the mid 1870's that they became widely available as "magic lantern slides." These were capable of being projected onto a screen or wall from a machine called a magic lantern or stereopticon, which passed a bright beam of light through the slide and an enlarging lens. The name stereopticon is a confusing misnomer, since these had nothing to do with stereo photography, but were an early form of the slide projector, which in time was developed into the motion picture projector as well.

Developing mechanical means for printing photographs with a printing press or lithograph was a major concern of 19th century inventors. Finally, about 1870 a practical means of photomechanical reproduction became available, but it was not very good at reproducing the gray shades. Then, about 1880, the halftone method was perfected, allowing accurate reproduction of photographs at reasonable cost and giving rise to many illustrated magazines and newspapers.

Initially, photographs were limited in size by the size of the camera and photographic plate. One of a kind photos like daguerreotypes were of course the size of the plate used to make them. With glass plates, the print was produced by placing the plate against a sheet a paper and letting light pass through the negative, producing a photo exactly the same size as the negative. A process for enlarging prints was invented in the late 1850's but it was not until almost 1880 that it became widely available.

The magic of photography caught the popular imagination as soon as it became known and available. By 1853 there were 86 photographic studios in New York City each churning out hundreds of portraits every sunny day. There were over 400,000 daguerreotype plates produced in Massachusetts alone in 1855. By 1873 there were an estimated 5,250 photographers in the U.S. But it was not until the introduction of the Kodak camera in 1888 that the practice of taking pictures began to reach the masses. The Eastman Kodak company introduced an innovation that made photography accessible to the average person-they did the developing and printing, all the user had to do was take the picture! Prior to that time, all photographs were taken either by professional photographers or very dedicated amateurs who were willing to go through the entire tedious and difficult process. After 1888 almost every aspect of everyday life became subject to photographic recordation, and a boom that goes on even today was born.

With the coming of the 20th century photography has advanced by leaps and bounds. The first film was developed late in the 19th century, made of a dried gelatin. This film was very fragile and did not gain widespread popularity. Then in 1889 a nitrate based, plastic roll film was developed. Due to a tendency to curl, this film also lacked popularity, but in 1903 a non-curling variety was developed, and began to be widely used, and in 1913 the film became available in sheet form and began to compete with the glass plate negative, which it eventually supplanted. Even the new moving pictures were filmed on nitrate film. The only problem was, the nitrate film was very flammable, and when burned gave off a poisonous gas. Safety film, a non flammable plastic based film was developed in 1939 and soon replaced sheet and roll nitrate film for still photographs, and in another ten years in movie film as well.

The photographic papers in use in this century tend to be sturdier than those of earlier years, so the practice of pasting them to cardboard mounts was mostly dropped. Professional photographers still used cardboard backings, sometimes folding cards that covered the front of the photo as well and could serve as a stand, but the picture was just slipped into slots in the mount, or tacked lightly in one spot to hold it in place.

Other twentieth century developments have been color film, plastic transparencies (such as slides), and instant photography - film that develops itself just moments after the picture is taken. Now moving pictures are being digitized and recorded on tape (VCR's) and almost every home has at least one camera. Satellites take pictures of earth from far out in space, and every doctor's office is equipped with x-ray equipment to take pictures of inner space. Photography has advanced so far that we often take it for granted, and find it hard to imagine the wonder with which the invention was greeted 150 years ago. Photographs have become so ubiquitous and little valued that they are often disposed of out of hand. We forget that these images of the past are irreplaceable- that moment is gone forever, only its image remains. Let's see if we can't manage to preserve some of those captured moments for the future.

This brief overview of the history of photography touches only on the mainstream trends and important contributions. Photographs have been made on ivory and leather, and by methods and means not mentioned here, but this is not intended as an exhaustive compilation of every path photographic science has followed, but as a general introduction to the broad overview of photographic history. An understanding of this history can help one date and identify old pictures, and better appreciate their irreplaceable nature.

For a more detailed history of photography, you should see the absolute classic work on the subject History of Photography by Beaumont Newhall. And for an entertaining look at the world's greatest photographic museum, along with a comprehensive view of the history of photography from daguerreotype to modern digital technology, take a look at Photography from 1839 to Today: George Eastman House, Rochester NY edited by William S. Johnson, Mark Rice, Carla Williams, and Therese Mulligan. And finally, for a comprehensive and up-to-date guide to pretty much all that is known about the historical development of photography, see the hefty book A World History of Photography by Naomi Rosenblum. Almost 700 pages of information, this book places photography in its historical context.

Andrew J. Morris,

Listed here are the main types of historic photographs one is likely to encounter. Probably 80% of the 19th century portrait photos the genealogist or local historian finds will be card mounted, particularly CDV's and Cabinet Cards; and another 10 to 15% will be tintypes. Scenic photos from that period are mostly found as Stereo Cards, though there are many in the large sized card mounted formats as well.

AMBROTYPE

Figure 1 AMBROTYPE



The Ambrotype is essentially a glass negative with a black background that makes the image appear positive. It is a cased photo. Invented about 1854, the form lost popularity in the early 1860's when tintypes and CDV's replaced them. SAMPLE. There are some wonderful ambrotype portraits still in existence, yet the process is much neglected by authors. The only book I know on the process is out of print, but worth searching for if you can find a used copy: Ambrotype, Old and New by Thomas P. Feldvebel.



CALOTYPE

Figure 2 CALOTYPE

The Calotype, sometimes called the Talbotype after its inventor, William H. F. Talbot, is a paper print made from a paper negative. Never widely popular in the U.S., this format was more common in England in the 1840's. The image produced lacks sharp detail, the soft focus being due to use of a paper negative. If you would like to learn more about the process, or even try it yourself, see the book Primitive Photography: A Guide to Making Cameras, Lenses, and Calotypes by Alan Greene.



CABINET CARD

Figure 3 CABINET CARD

Cabinet Cards are a card mounted photograph introduced in 1866, and tremendously popular, especially in the U.S., from its introduction until just after the turn of the century. The Cabinet Card is easily distinguished from other card mounted photos by its size, typically 4.25 x 6.5 inches (108 x 164 mm). Like the CDV, the vast majority are portraits, and most of them are not identified with the subjects name. Many do have a photographers imprint. SAMPLE

CARD MOUNTED

In addition to the Carte-de-Visite, Cabinet Card, and Stereotype, which are described individually, there were a variety of other card mounted photos, in more-or-less standardized sizes, some of the most common being called Victoria, Imperial, Promenade, Panel, and Boudoir. Panoramic photos were also often card mounted, though the size was not standardized. None of these other sizes are as common as the CDV, Cabinet Card and Stereotype. SAMPLE



CARTE-De-VISITE

Figure 4 CARTE-De-VISITE

Carte-de-Visite's, or CDV's, are a type of card mounted photograph introduced in the mid 1850's and tremendously popular especially in America and Europe from 1860 until almost the turn of the century. The CDV is easily distinguished from other card mounted photos by its size, typically 2.5 x 4 inches (63 x 100 mm) or slightly less. The various characteristics of card mount, image and photographer's imprint often allows these images to be correctly dated to within a few years of their origin. The vast majority are portraits; unfortunately most of them are not identified with the subject's name. Even this is not always an insurmountable problem however, if a collection of photos from one photographer are compared to images in county histories or previously identified images from the same area, it is sometimes possible to match them up. SAMPLE



CASE MOUNTED

Figure 5 CASE MOUNTED

Daguerreotypes and Ambrotypes, and occasionally the earliest tintypes, were sold in cases, usually made of leather over a wood and cardboard framework. In 1854 the "Union" case was introduced, sometimes described as being made of gutta-percha, this hard black material can be viewed as one of the first commercial uses of plastic. The Union case was molded with various designs, and have unfortunately become so popular with collectors that the photographs are often removed, leaving them susceptible to damage. SAMPLE of outside of Union Case and SAMPLE of inside of Union case. If you want to learn more about Union cases see the book Union Cases : A Collector's Guide to the Art of America's First Plastics by Clifford Krainik and Carl Walvoord.



DAGUERREOTYPE

Figure 6 DAGUERREOTYPE

Many believe the daguerreotype to be the most beautiful of photographic processes. Introduced in 1839, it was the first widely used means of photography. The daguerreotype uses a polished, silver plated sheet of metal, and once seen is easily recognized by its mirror-like surface. The plate has to be held at the correct angle to the light for the image to be visible. That image is extremely sharp and detailed. Daguerreotypes fell out of favour after 1860 as less expensive techniques supplanted it. SAMPLE For a detailed look at this process with an emphasis on the science and chemistry, see the book The Daguerreotype: Nineteenth-Century Technology and Modern Science by M. Susan Barger and William B. White.

FILM

In the late 1800's, gelatin, and later plastic films gradually began to replace glass plate negatives. Gelatin sheet film was introduced in 1884, roll film in 1889. Geletin was found to be too fragile, and was supplanted by Nitrate based films, which are highly flammable. In 1939 "Safety" film was introduced, a non- flammable plastic based material.



GLASS PLATE NEGATIVES

Figure 7 GLASS PLATE NEGATIVES

Most 19th century photographs were made on glass plate negatives, excepting of course the Calotype, which used a paper negative, and the Daguerreotype and Tintype, neither of which required negatives. Early glass plate negatives used a process that required them to be coated just before use, and hence were known as "wet-plate" negatives. Although dry plate negatives were introduced as early as 1864, they were not very sensitive, and it was not until after improvements were made that dry plates began to be widely used in the early 1880's. Both wet and dry plates may be further classified according to the emulsions used, usually albumen, gelatin or Collodian.

SAMPLE



HYALOTYPE

Figure 8 HYALOTYPE

The Hyalotype was a positive image on a glass plate. Used in "Magic Lanterns" the image was projected onto a screen, the precursor of modern slides. Invented in the 1850's, this format did not become popular until after 1875 when they began to be widely used. SAMPLE