

An Introduction to Photographic Processes and Formats



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Front cover illustrations (left to right)

Frank Mottershaw, founder of Sheffield Photo Company (*Picture Sheffield: y2357*)

Advertisement from White's 1860 Sheffield Directory (*Sheffield Local Studies Library*)

Advertisement for Ensign camera film, 1960s (*Sheffield Archives: SY132/F8*)

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Introduction

This booklet lists sources available within Sheffield Libraries Archives and Information for the study of the history of photography.

It is not a detailed history of photographic processes and techniques; it merely points the reader who wishes to carry out their own research to what is available within Sheffield Libraries and Archives.

Sheffield Libraries has a vast image collection which dates from the earliest photographic work in the 1850s and continues right through to digital images of the 21st century. Using examples from this collection we have described below the many different methods that have been used over the past 160 years to capture and view photographic images.

In addition to the photograph collections themselves Sheffield Local Studies and Archives have trade directories from the 19th and 20th centuries which list photographers and often include advertisements. Nineteenth and 20th century census returns (available free at all Sheffield Libraries via Ancestry.com) will also list photographers. There are also catalogues, correspondence and other papers from individual photographers and photographic societies available.



The earliest photograph in the Sheffield collections - Arthur Hayball and family, 1850s

(Sheffield Local Studies Library: picture Sheffield: y00523)

Timeline showing key dates

1839	Louis Daguerre develops the first practical photographic process.
1841	The Calotype process was developed by Henry Fox Talbot.
1850	Albumen printing paper introduced.
1851	Frederick Scott Archer developed a new process known as wet collodion negatives.
1852	Scott Archer's collodion positive or Ambrotype process developed.
1854	The carte de visite system was introduced.
c. 1855	Another cheap and popular process - Ferrotype - was introduced.
1866	Cabinet photographs became popular.
1878	Dry plate photography introduced.
1888	First box camera introduced by George Eastman.
1889	First celluloid roll film produced.
1900	Kodak brownie camera introduced.
1902	Postcard format first used, becoming popular in the 1920s and 1930s.
1930s	Colour and roll film become popular.
1972	The compact 110 film format introduced.
1990 - 1991	First black and white digital camera available.
1994	Kodak's Apple Quick Take 100 colour digital camera introduced.
1997	First digital camera printer available; first 1 megapixel camera.
1999	Roll film sales peaked. From this point they dropped by 25% each year as digital cameras became more popular.
2004	Flickr, the photograph sharing website established.
2007	Last Polaroid camera made.
2009	Eastman Kodak Co announced the stopping of production of its famous Kodachrome brand of film; Polaroid film production also ended.
2010	5 billion photographs available on Flickr.

Daguerreotype

The world's first practical photographic process was announced by Frenchman Louis Daguerre in 1839.

The Daguerreotype image was formed directly onto a silvered copper plate. There was no negative and duplicates could not be made directly. The plate was polished and sensitised with iodine and bromine before being exposed in the camera, the image developed in a mercury vapour and fixed to make the process permanent. It became common to gild the processed image in a solution of gold chloride.

A tinted daguerreotype
c. 1850

(Sheffield Archives:
SY284/B17/1)



The result was a high quality positive image on a mirror like surface. The viewing angle was critical as at some angles the picture could appear negative. The image was also laterally inverted, as in a mirror, although mirrors or prisms could be used to correct this. They were generally fairly small, 2 inches x 2 inches being a typical size.

The surface of the plate was very delicate and could easily be damaged by touch or by exposure to damp. It was therefore sealed behind glass, often with a gilt mount placed between the two to enhance its appearance, placed in a narrow metal frame and usually fitted into a case. The most common cases were leather covered and plush lined but from 1854 a new case, the Union Case, became available. These originated in America and were made from an early form of plastic material. It was moulded in a steel die and when hard retained the finely detailed designs of the die.

'The ... Daguerrotype is altered, contrasts are made to blend, black and white to harmonise.'

(Testimonial for Brownes photographs, Sheffield, trade directory, 1849 *Sheffield Local Studies Library*)

An advertisement from
White's 1849 Sheffield
Directory

(Sheffield Local Studies
Library)

**PHOTOGRAPHIC
LIKENESSES OR PICTURES,**
EXECUTED BY THE ACTION OF LIGHT.

MR. BROWN
BEGS respectfully to inform the Public, that the
PHOTOGRAPHIC ROOMS,
27, JOHNSON-ST., SHEFFIELD,

Are at present OPEN for the Production of these **LIFE-LIKE**
and **BEAUTIFUL PICTURES**, as PERFECTED by
the RECENT IMPROVEMENTS, at the following Moderate
Charges:—

	£.	s.	d.
For a Miniature, coloured and mounted in Morocco } 0 12 0			
Pocket Case } 0 12 0			
Do. do. extra size, $\frac{1}{2}$ length 1 0 0			
Do. do. largest size, $\frac{3}{4}$ or full length 1 5 0			

For Two Figures on the same Plate, an addition of one-half the price
of each, for either of the above sizes.

DUPLICATE PICTURES AT A CONSIDERABLE REDUCTION.

From the recent Improvements, these Pictures can be taken with
equal facility in the most clouded atmosphere,—LIGHT, and not the
Direct Rays of the Sun, being alone necessary.

SPECIMENS may be INSPECTED at Messrs. CHADBOURN'S, NURSEY,
AND AT THE ROOMS.

Daguerreotypes became very popular and as improved chemical processing and lenses brought exposure times down to under a minute they were widely used for portraits. England was the only country where the process was patented and its use was strictly controlled by Richard Beard who held the licence. He opened the first British commercial photographic studio in London in March 1841. His charge was 2 guineas for a portrait but in less fashionable studios a small Daguerreotype may have cost 1 guinea or less. The process remained in general use until the mid 1850s.

*'Improvements
constitute a perfect
triumph - the flesh tints
are clear, warm and
natural.'*

(Testimonial for Brownes photographs,
Sheffield trade directory, 1849 *Sheffield
Local Studies Library*)

*'Photographic pictures,
have a lifelike appearance,'*

(Testimonial for Brownes photographs, Sheffield
trade directory, 1849 *Sheffield Local Studies
Library*)

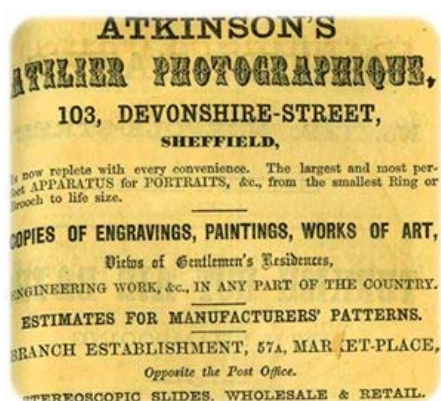
Calotype

The Daguerreotype's chief rival was the Calotype invented by Henry Fox Talbot. This produced a much cruder image but as the process involved a paper negative from which prints could be made it formed the basis from which modern photographic techniques developed.

Because of patent restrictions and technical limitations the Calotype never seriously competed with the Daguerreotype for portrait work. However, Talbot allowed amateurs free use of the method and the simpler and cheaper process had great advantage for them.

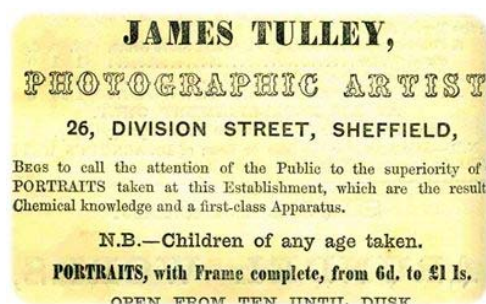
Wet Collodion Negatives

In 1851 Frederick Scott Archer described a new photographic process using collodion (gun-cotton dissolved in ether) and potassium iodide to coat a glass plate. A second coating of silver nitrate sensitized the plate which was then exposed in the camera while still wet and developed, fixed and washed. This was the wet collodion negative which was much more sensitive than the Daguerreotype or Calotype and could record fine detail and tones.



Advertisements from
White's 1860 Sheffield
Directory

(*Sheffield Local Studies
Library*)



At the same time a new type of photographic paper was introduced which could record the detail of the collodion negative. This albumen printing paper remained in use until the 1890s.

Collodion Positive or Ambrotype

In 1852 Scott Archer published a variation of the collodion process in which the negative was whitened with a solution of mercuric bichloride. When backed with black paper or velvet or coated with black varnish the negative image then appeared positive. This was the collodion positive or Ambrotype which became popular for portrait work.

Like the Daguerreotype this required the protection of a glass cover and case but the quality was generally poorer. The process required little skill, modest equipment and no license and led to a great expansion of photographic studios offering cheap portraits. It remained popular into the 1880s.



Photographers, 1890

(Sheffield Local Studies
Library: Picture Sheffield
Y637)

Ferrotypes or Tintypes

The ferrotypes or tintypes was a variation on the collodion positive process using black enamelled tinplate instead of glass. It became popular in the 1860s particularly with beach, fairground and street photographs who could prepare, expose and finish a picture on the black or brown tinplate in a few minutes. Specially designed cameras allowed all the chemical processes to be carried out inside the camera.

Ferrotypes were rarely of good quality but were the cheapest form of photograph which may have attracted people who would not have gone to a proper studio. They remained in use until after the Second World War.

Carte de Visite

The cost of photographs was considerably reduced by Andre Disderi who in 1854 patented a method by which several portraits could be photographed on a single plate using a multi-lensed camera. 8 portraits were usually taken on one plate and the resulting 2 ¼ inch x 3 ½ inch prints were mounted on cards 2 ½ x 4 inches. This was the usual size for visiting cards and the photographs became known as cartes de visite.

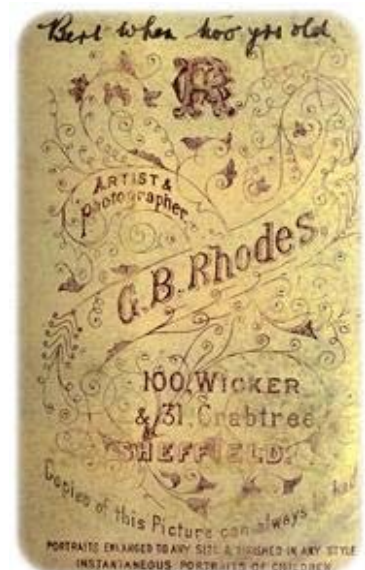
The rear of the card carried increasingly elaborate details of the photographer concerned and this can prove a useful way of dating the photograph. The photograph itself can also be helpful in this respect as the poses are often stereotyped and, like the clothing worn by the subjects, gradually evolved over the period.



© Sheffield City Council, 2010

A carte de visite by G B Rhodes, Artist and Photographer of 100 Wicker and 31 Crabtree, Sheffield, c. 1898

(Sheffield Archives:
SY284/B17/22)



The carte de visite became very popular from about 1860 and a craze developed for collecting photographs of royalty and other celebrities as well as those of friends and relatives. The move from cased photographs to prints also created a demand for albums. The thick board pages usually had apertures cut to hold the cartes and the covers of the albums often had elaborate designs.

Cartes remained popular until the turn of the century and at a price of perhaps half a guinea per dozen brought photography within the means of many more people.



The reverse of a carte de visite advertising T S Hicks' studio at Cemetery Road, Sheffield "*Nether Edge cars pass the door*", 1890s

(Sheffield Archives: SY284/B17/8)

Cabinet Photographs

From 1866 the carte de visite was to some extent replaced by the cabinet photograph, similar in appearance but measuring 5 inches x 4 inches. The cabinet photograph was more suitable for quality portraiture.

Dry plate Photography

Photographers were still inconvenienced by the need to prepare and expose the wet collodion negative on the spot which necessitated bulky equipment and a portable darkroom. However, plates with a new gelatin emulsion were introduced in 1878. These retained their sensitivity for long periods and could be bought from a manufacturer as required.

The new plates were also very sensitive which in turn reduced the exposure time needed. For the first time 'instantaneous' photographs of fractions of a second were possible while in the studio the availability of electric lighting together with the short exposure time led to an increase in the number of photographs of 'difficult' subjects such as pets and children.

Popular photography

Despite improvements in equipment, photography still required a darkroom for loading and unloading the sensitive plates and for the developing and printing processes. While the informal snapshot photograph was technically feasible in the 1880s it still required the skills and resources of a professional or enthusiastic amateur.

The first steps towards bringing photography within range of everyone were made by George Eastman and after various unsuccessful designs the first Kodak camera was introduced in 1888. This simple box camera was sold ready-loaded with a roll of negative stripping paper sufficient for 100 circular pictures 2 ½ inches in diameter. There was no focusing; the camera was simply pointed at the subject and the shutter fired by pulling a string. The details could be recorded in the memorandum book provided and the film was wound on with a key. When the film was completed the camera was returned to the factory for unloading and processing. Eastman devised the slogan 'You press the button, we do the rest' for the most revolutionary part of the system was the separation of picture taking from developing and printing.

Various other technical developments were made the first celluloid roll film in 1889, a film which could be loaded in daylight in 1891 and the Pocket Kodak camera with a 12-exposure roll film for pictures 1 ½ x 2 inches in 1895 which sold for 1 guinea. However the real breakthrough in cost came in 1900 with the Kodak Brownie camera which sold in England for 5 shillings and brought photography to the masses.

Stereoscopic photographs

In the 19th century stereoscopic photographs became popular. The concept was invented in the 1830s and became popular in the mid - latter half of the century. By viewing two images of the same subject side by side, with a little variation in perspective it was possible to create the illusion of depth or 3D. Stereoscopic viewers were used to create the illusion.



A stereoscopic photograph of Barker's Pool, Sheffield during the visit of Queen Victoria, 1897

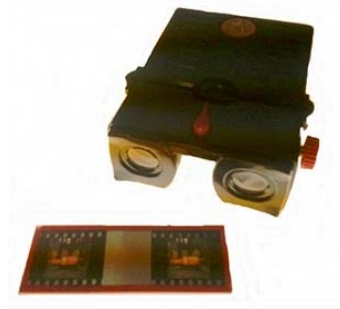
(Sheffield Archives: SY132/F6/5)



(left) a Victorian stereoscope

(right) a battery powered stereoscope from the 1960s with stereo glass image

(Sheffield Local Studies Library)



Postcards

The rise in popularity of the picture postcard led to the appearance from about 1902 of sensitized cards about 3 ¼ x 5 ½ inches with gelatin silver emulsion on one side and the other side printed for the address and message. The postcard was the most popular professional format in the 1920s and 1930s and often carry the photographer's name and address.

Negatives

Early photographic work involved 'wet collodion' glass negatives - a glass plate immersed in chemicals and then placed at the back of the camera. By the 1870s gelatine dry plates were introduced. This meant that the negative could be stored and used to make countless prints. This convenient dry process really helped open up photography to the masses. Later still, in the 1880s, roll film was introduced, making photography even easier. At the end of the film, it was removed from the camera, and often taken to a chemist (or photographic studio) to be developed.



Left: a box of 3 ¼ inch glass plate negatives, c. 1900.

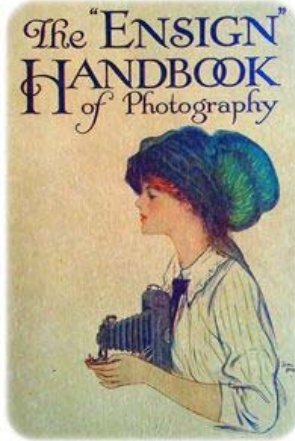
(Sheffield Archives: MD7105/18)

Right: a camera film and strip of 35mm negatives, 1980s



The 20th century

During the 20th century photography became ever more popular. As living standards rose and the cost of cameras, film and processing declined more people took up the hobby. Chemists often diversified to include photographic services - selling cameras and films and offering developing services.



Advertisements
for photographic
products, early
20th cent

(Sheffield Archives:
SY284)



In the 1930s colour film became more widely available. In the same decade 35mm roll film was introduced. Its popularity was to last for the rest of the 20th century. In 1972 a new film format was introduced - the 110. This was smaller than 35mm film.

The 1950s saw the introduction of the Polaroid camera. This new development allowed the photographer to (literally) pull the film from the camera after taking a picture. As the film was pulled out it passed between rollers which forced chemicals to be released onto the combined film/negative and a picture appeared within a matter of seconds. Instant photography had finally arrived.



A Polaroid photograph,
popular in the 1970s
and 1980s

It was in the late 20th century that digital photography began to replace traditional roll film cameras. The advent of digital cameras meant that many more photographs could be taken, seen immediately and deleted if not required. There was far less cost involved in printing hard copy images. Digital images also meant they could be manipulated (colour tones, brightness, contrast, cropped, etc) with relative ease. They could also easily be shared via email and websites.

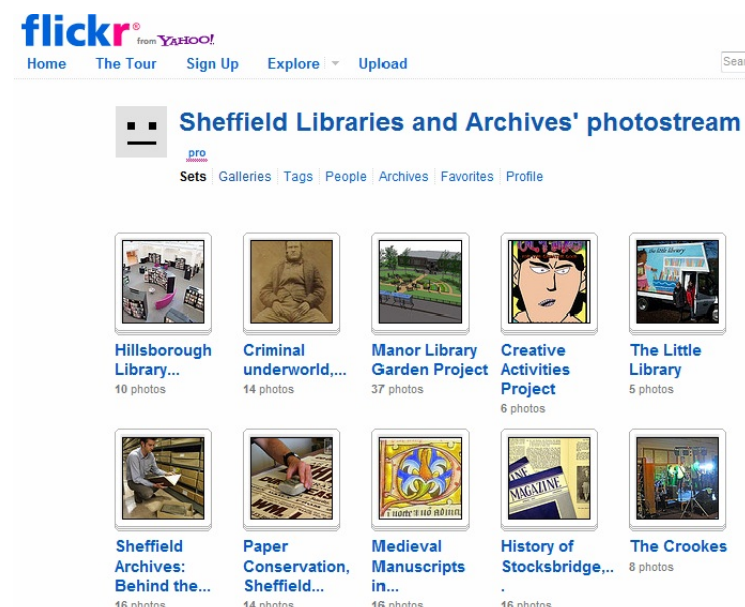
In 1990 - 1991 the first commercial digital camera was introduced. Only able to take black and white images, it was to be three years (in 1994) before the first colour digital camera arrived (the Kodak Apple Quick Take 100). It could store just 8 images and a computer on which to view them was also required. Three years later the first printer was developed for use with a digital camera - the HP Photosmart. Also in 1997 the first 1 megapixel camera was introduced.

The 21st century

As the 21st century dawned the first commercial mobile phone complete with a built in camera was developed. It was from this point that photography really did become easy, instant and ubiquitous.

The decline in the use of roll film which had led to the first explosion in popular photography was accelerated by the fact that almost everyone with a mobile phone could take a photograph with hardly more than a few seconds preparation. In 2007 the last Polaroid camera was produced and two years later the production of Polaroid film was ended. In 2009 Kodak stopped production of its popular Kodachrome brand of film. Film cameras do remain in use to this day and high street photographer stores still supply roll film, though often only to professionals or dedicated amateurs.

In the first decade of the 21st century a website for sharing photographs was developed called Flickr which rapidly became popular. Within 6 years over 5 billion photographs had been uploaded, most freely available to anyone anywhere in the world.



Sheffield Libraries and Archives Flickr page, 2010

Further Reading

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(Sheffield Local Studies Library: B.TALB S; also available at Sheffield Reference and Information Library: B.TALB and Sheffield Conservation Unit)

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Pols, Robert, *Family Photographs 1860 - 1945* (Public Record Office, 2002)
(Sheffield Archives: POL/FAM TREE; also available at a number of community libraries: 929.1072)

Rees, Rosemary, *Sources for History 1700 - 1900: Pictures and Photographs* (1982)
(Sheffield Archives: REE/GEN SOURCE)

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(Sheffield Conservation Unit)

Rempel, Siegfried, *The Care of Photographs* (Nick Lyons Books, 1987)
(Sheffield Conservation Unit)

Taylor, Maureen A., *Preserving your family photographs: how to organize, present and restore your precious family images*
(Sheffield Local Studies Library: 779 SQ; also available at a number of community libraries: 771.46 Q)

Wall, J., *Directory of British Photographic Collections* (National Photographic Record, 1977)
(Sheffield Archives: WALL/ART)

A Guide to Early Conservation of Photographs (Eastman Kodak Co., 1985)
(Sheffield Conservation Unit)

Websites

Sheffield's principal photographic collection: www.picturesheffield.com

Fox Talbot Museum: www.nationaltrust.org.uk/main/w-vh/w-visits/w-findaplace/w-lacockabbeyvillage/w-lacockabbeyvillage-talbotmuseum.htm

Victorian and Albert Museum: www.vam.ac.uk/collections/photography/index.html

British Library: www.bl.uk/catalogues/photographs/

Camera Museum: <http://thecameramuseum.com/>

National Media Museum Kodak gallery:
www.nationalmediamuseum.org.uk/PlanAVisit/ExploreOurGalleries/Kodak.aspx

Sheffield Archives and Local Studies services collect and preserve original records and printed material relating to Sheffield and the surrounding area.

The information dates from the 12th century to the present and relates to Sheffield, South Yorkshire and north Derbyshire.

Included are extensive collections of books • pamphlets • photographs • church registers • newspapers • census records • minutes • diaries • films • maps • deeds • records from schools • hospitals • businesses and charities • family estates • personal papers etc.

Our facilities include:

Study areas • expert staff on hand to help you make the most of your visit • a library of reference books • photocopying and photography services • free Internet access • microform machines and printers • catalogues and indexes • a range of useful publications for sale • CD-Rom library • on-line image library.

Adding to our collections

Sheffield Libraries and Archives seeks to preserve information about events in our city's history. If you have photographs or personal papers that may be worth preserving please consider safeguarding them for current and future generations by placing them in the care of Sheffield Libraries and Archives. It is only through the generosity of individuals and organisations that we are able to have a complete record of important events in the history of Sheffield and the nation. We are interested in photographs, flyers and posters, minutes of meetings etc. For advice on record keeping and the facilities we offer please contact Peter Evans, Archives & Local Studies Manager (pete.evans@sheffield.gov.uk or 0114 203 9397).

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archives@sheffield.gov.uk

General details:

www.sheffield.gov.uk/libraries

For over 40,000 images of Sheffield:

www.picturesheffield.com

Local Studies catalogues (since 1997):

<http://library.sheffield.gov.uk/uhtbin/webcat>

(Selected) Archives catalogues:

www.a2a.org.uk