

Photography is an art that took many years, and the efforts of many individuals to perfect. Many different people in many different fields contributed to this "light writing." Chemists, artists, inventors, and engineers all lending a crafting hand to the art.

Photography was eerily predicted in the mid-1700's by la Roche in his work Giphantie. In this tale, it was possible to record images from nature on a canvas coated with a sticky substance. Unfortunately the author died before he could see his fiction become real.

Two different scientific processes had to combine in the 1830s to make photography possible. Its surprising that photography did not come around sooner due to the fact that the two processes were around for a long time before they were put together to form photography.

The first process was optical. The camera obscura was the first known camera. The principle was known to the Arabs before 1038 and had been drawn by Leonardo da Vinci in 1519. The camera obscura was a dark chamber or room in which there was a small hole in the wall. The picture would be formed on the opposite wall, however, it would not be sharp due to the lack of a lens. Giovanni Battista della Porta was the first to suggest the camera as a guide for drawing in 1558. As the interest in the camera obscura grew its size diminished, until it became a portable device. The artist could just put a piece of tracing paper on top of the viewing screen and trace the picture. Hence, the camera became one of the artists' tools.

The second process was chemical. For hundreds of years chemists knew that some colors are bleached in the sun but had made no distinction between heat, air, and light. In the seventeenth century, Robert Boyle had reported that silver chloride turned dark after exposure, but believed this was due to air and not light. Angelo Sela, around the same time period, noticed that powdered nitrate of silver is blackened by the sun. In the 1720s, Johann Schulze discovered that exposing saturated chalk with nitric acid that contained some silver to the sun made it change color. He realized that it was the silver and nitric acid that caused the solution to change and was able to stencil out letters on bottles. Since there was no way to make these stencils permanent they soon faded away. In the early 1800s, Thomas Wedgwood had successfully captured images, but had no way to keep them permanent. Swedish chemist Carl Scheele confirmed that the blackening effect of the silver salts was due to light and not heat. He proved this by pouring ammonia on the powder. He discovered the blackened silver was insoluble in ammonia. Thus, he discovered a fixer. He did not recognize the importance of his discovery to make a photograph permanent.

The first successful permanent camera image was done by Joseph Nicéphore Niépce, a Frenchman. His son would etch drawings on the lithographer's stone and Niépce would do the chemicals. When his son went into the army he had to find a way to make the action of light etch the picture into the pewter plate. He succeeded in making one in 1822 using a camera obscura. This process was called heliography (sunwriting), and it took eight hours for the image to be recorded on the pewter plate. In 1833 Niépce, the inventor of photography, died.

Daguerre had made a partnership with Niépce in 1829, and learned his methods. Daguerre set out to make the process practical. He made photographic plates which reduced the exposure time to thirty minutes. He improved the product and named it the "Daguerreotype." The Daguerreotype was greeted with enormous interest and became a craze overnight. The images were extremely sharp, and is better than a modern day print. Artists even saw the daguerreotype as a threat to themselves, and that possibly painting might go extinct all together. There were downsides to the Daguerreotype however. The photo could not be duplicated and was expensive. The image could only be seen at a certain angle and could rub off very easily.

During the same time William Henry Fox Talbot was working on his own method the "Calotype." His first successful images were made in 1835, were photograms. The earliest paper print by this method was done in August 1835 of a window in Lacock Abbey. The negative is small (1 inch square) and of poor quality compared to the Daguerreotype process. By 1840, Talbot had made some significant improvements, and by 1844 he came out with a photographically illustrated book *The Pencil of Nature*. He also discovered hyposulfite of soda from John Frederick William Herschel, a chemist. He immediately put Herschel's fixer to use. Herschel also coined the term photography, which means in Greek "light writing." The Calotype could not compete with the Daguerreotype and in 1847 Talbot and Daguerre made public their discoveries. In 1848 a cousin of Nicéphore Niépce, Abel Niépce de Saint-Victor, perfected a process of coating a glass plate with white of egg sensitized with potassium iodide, and washed with an acid solution of silver nitrate. This new process made for very fine detail and much higher quality. However, it was very slow, hence the fact that photographs produced on this substance were architecture and landscapes; portraiture was simply not possible.

In 1851, a new era in photography was introduced by Frederick Scott Archer, who introduced the Collodion process. This process was much faster than conventional methods, reducing exposure times to two or three seconds, thus opening up new horizons in photography. The Collodion process was also much cheaper than the Daguerreotype. The collodion process required that the coating, exposure and development of the image should be done whilst the plate was still wet. Another process developed by Archer was named the Ambrotype, which was a direct positive. The wet collodion process, though in its time a great step forward, required a considerable amount of equipment on location. There were various attempts to preserve exposed plates in wet collodion, for development at a more convenient time and place, but these preservatives lessened the sensitivity of the material. It was clear, then, that a dry method was required.

In 1871, Dr. Richard Maddox discovered that gelatin could be used instead of glass for the base of the photographic plate. This led to a dry process method. At first it was very insensitive compared to the existing process, but was much quicker in development than any previous technique. With some refinements it was possible to make photographic material in factories. The introduction of the dry-plate process marked a turning point. No longer did one need the cumbersome wet-plates, no longer was a darkroom tent needed. One was very

near the day that pictures could be taken without the photographer needing any specialized knowledge.

Celluloid had been invented in the early eighteen-sixties, and John Carbutt persuaded a manufacturer to produce very thin celluloid as a backing for sensitive material. George Eastman is particularly remembered for introducing flexible film in 1884. Four years later he introduced the box camera, and photography could now reach a much greater number of people. He patented a camera that was loaded with 100 exposures of film. The camera was sold for \$25 and was named Kodak. When the pictures were taken you simply sent it in and the film was removed and processed, then a new 100 exposures were returned to the sender with the finished prints. Other names of significance include Herman Vogel, who developed a means whereby film could become sensitive to green light, and Eadweard Muybridge who paved the way for motion picture photography. Popular in the Victorian times was stereoscopic photography, which reproduced images in three dimensions. It is a process whose popularity waxed and waned - as it does now - reaching its heights in the mid-Victorian era. Technology caught on and eventually brought us to the cameras we have today. Many different movements caught on to the world of photography such as, travel, motion, time, and perception. The idea that photographs cannot lie adds to the drama and the intensity of pictures. Photographs can be used for journalism, documents, and art. Photography was just a puzzle waiting to be put together.