

# P03: A Picture as Good as I Could Wish

## Heliography and the First Photograph

WC 3449

It was just over twenty years after the death of the young Tom Wedgwood in England that photography was born in France near the Burgundian town called Saint-Loup-de-Varennes. In 1826, a gentleman experimenter called Joseph Nicéphore Niépce succeeded in making the world's first permanent image using a *camera obscura* which, because we are now truly in the age of photography, from now on I will call simply a *camera*.

*Joseph Nicéphore Niépce,  
circa 1795*

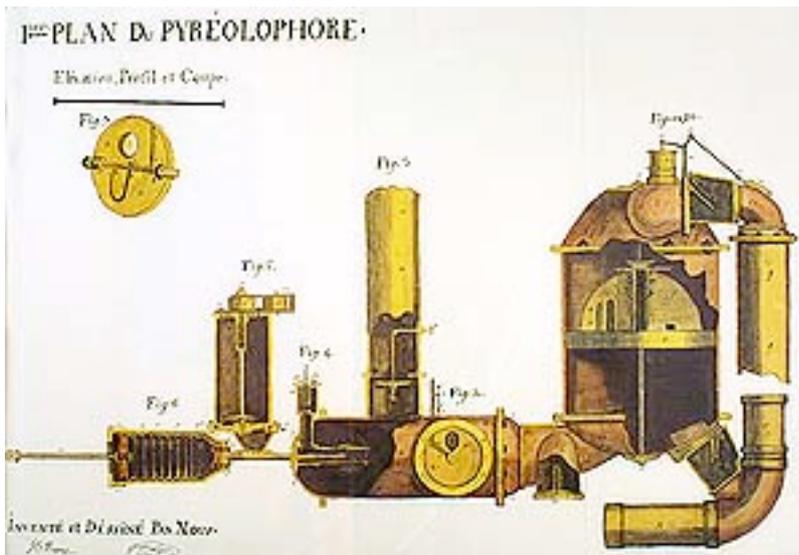
But first, a little aside: there seems to be some dispute how the father of photography might have pronounced his surname. The accent suggests it should be said in two syllables but generally, at least in English histories, it seems to be commonly pronounced as though it were [ni:ps], ie, in one syllable.



Niépce was born in 1765 in Chalon-sur-Saône into a middle-class family which was still comfortably off even after the Revolution of 1789 robbed them of some of their wealth. His early career included time as a teacher and in the army but in 1801 he returned to the family estate, called "Le Gras", where he joined with his brother Claude not only in running the estate but also in refining and promoting an invention which was in the end to eat up most of the family fortune. This invention they patented under the name of *Pyreolophore*<sup>1</sup>. In 1806, a commission of the National Institute (or Sciences Academy) tested and reported on the Niépce brothers' invention:

---

<sup>1</sup> From Pyr=fire, eolo=wind and phore=I carry or I produce. For a detailed description of this machine see <http://www.maison.niepce.museum/pagus/pireus1.html>



*First plan of the pyreolophore, drawn by the Niépce brothers*

*The fuel ordinarily used by M.M. Niépce is made of lycopodium spores, the combustion of which being the most intense and the easiest one; however this material being costly, they replaced it with pulverized*

*coal and mixed it if necessary with a small portion of resin, which works very well, as was proved by many experiments. In M.M. Niépces' machine no portion of heat is dispersed in advance; the moving force is an instantaneous result, and all the fuel effect is used to produce the dilatation that causes the moving force.*

*In another experiment, the machine installed on a boat with a prow about two feet wide by three feet high, reduced in the underwater part and weighing about 2,000 pounds, went up the Saone river with just the engine power, with a speed greater than the river's in the opposite direction; the amount of fuel burnt was around one hundred and twenty-five grains per minute, and the number of pulsations was twelve to thirteen in the same amount of time. The Commissioners then conclude that the machine proposed under the name Pyreolophore by M.M. Niépce is ingenious, that it may become very interesting by its physical and economical results, and deserves the approbation of the Commission.*

*— Report by Lazare Carnot and C.L. Berthollet on December 15th 1806.*

The following year, the brothers received a 10-year patent, signed by the Emperor Napoleon. Although by the time the Commissioners tested the Pyreolophore they had already started using a mixture of one part resin with nine parts fine coal dust, which was cheaper and performed better than the fern spores used originally, they later introduced a further improvement in which they injected what was called "white oil of petroleum"<sup>2</sup> into the motor. This in fact amounted to the invention of fuel-injection, a practise used widely today, with which the Niépce brothers are credited as indeed they are also with the invention of the internal combustion engine. The bicentennial of their patent was celebrated in France in 2007.

<sup>2</sup> Kerosene would be the closest modern equivalent.

Even this innovation however, did not improve the performance of the Pyreolophore, which was intended to power small boats, to the point where it became commercially viable. Claude took their invention to England where the brothers hoped for greater success, leaving Nicéphore to run the family estate and, as it happened, to begin his studies in what he later called *heliography*, writing by the sun.



#### *Niépce in later years*

However, despite discussing the possibility of using light to produce permanent images as far back as 1793, Nicéphore Niépce did not start his latest round of experiments from a concern to produce an image in a camera but from an interest in the newly-invented and very fashionable *lithography*, a craze for which had been sweeping France from about 1813. He started out by coating the specially prepared lithographic stones with a light-sensitive varnish he had invented using *bitumen of Judea*, not one of the salts of silver. This naturally-occurring substance was commonly used as a resist in engraving and had two

properties which made it of interest to Niépce: first, it loses its black colour on exposure to sunlight and turns grey; second, it also hardens on exposure to light. This meant that the exposed part of the image would remain untouched when the unexposed bitumen was washed off with turpentine or oil of lavender. They were therefore the highlights although they appeared grey rather than bright; after washing, the unexposed areas became the shadow areas of the image and could be made to appear dark either by viewing in such a way they reflected a dark background or, more practicably, by using a dark metal for the plate.

Because his interest lay in lithography, Niépce first experiment with stone — those specially prepared stones used by lithographers — and prematurely as it turned out, reported to his brother in a letter dated 16 September 1824 that he had

*...succeeded in obtaining a picture which is as good as I could wish... It was taken from your room at Gras with my biggest camera and my largest stone...<sup>3</sup>*

---

<sup>3</sup> Quoted in Gernsheim, H: *The Origins of Photography*, Thames and Hudson, 1982, p33.

Despite Niépce's initial enthusiasm, by the time the stone had dried and he was prepared to attempt a first print from it, it was obvious the image was in fact too faint to be of use in lithography. Disappointed in the use of stone, Niépce then transferred his experiments to pewter, and it was on pewter that the first true photograph was produced in 1826.



*Joseph Nicéphore Niépce – View from the bedroom window at Le Gras, 1826.*

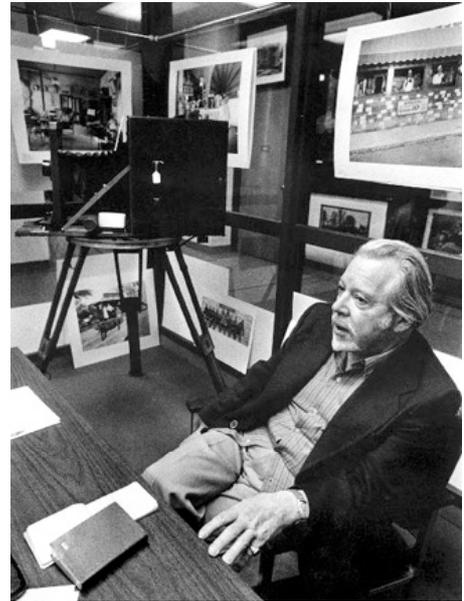
This, the First Photograph, was re-discovered by Helmut Gersheim in February 1952 after a long search. It was found in a trunk which had been in a London depository since 1917<sup>4</sup>. Gersheim, whose book *The Origins of Photography* has provided the backbone of what I have been saying so far, later donated this *First Photo* and several others and sold his huge collection of early photographic memorabilia to the University of Texas. However, let Gersheim tell how the *View at Gras* was made and later, re-discovered:

---

<sup>4</sup> Gersheim, H: *The Origins of Photography*, Thames and Hudson, 1982

## The Making and Re-Discovery of the First Photo<sup>5</sup>

*One hundred and fifty years ago [Summer 1826] Joseph Nicéphore Niépce succeeded in obtaining a camera picture on a polished pewter plate, sensitized with bitumen of Judea. This material has the unusual property of hardening in light (not blackening like silver salts) but its light sensitivity is small. Niépce needed 8-10 hours exposure in sunshine. He named his invention "heliography." After dissolving the unexposed parts of the picture in oil of turpentine and rinsing the plate, there remained, without the need for any other fixing, a permanent bitumen image of the light drawing, the shadows being indicated by the bare pewter plate. ....*



*Helmut Gernsheim, FRPS*

*The 16 x 20 cm view...shows the courtyard of his country estate Le Gras in the village of St. Loup-de-Varennes, and was taken from an upper window... My rediscovery...in February 1952 proved Niépce's invention of photography beyond any shadow of a doubt, eleven years before the first daguerreotype, and nine years before [William Henry Fox] Talbot's first camera image. Previously, the year 1839 had been arbitrarily selected as the birthday of photography, on account of the publication in that year of both photogenic drawing and the daguerreotype process. Henceforth 1826 was considered as the correct date...*



*Cardinal Georges D'Amboise in profile — Joseph Nicéphore Niépce. (Photoetching from an engraving)*

*In three years of research my wife and I traced all the five heliographs Niépce had brought to England in 1827, their presentation to [Francis] Bauer, their sale at his death in 1841 (for £14.4s.0d.) to Dr. Robert Brown FRS, and finally to J.J.*

<sup>5</sup> Quoted from Helmut Gernsheim's article, "The 150th Anniversary of Photography," in *History of Photography*, Vol. I, No. 1, January 1977:

*Bennett FRS. At Bennett's sale in 1884 the relics were split between H.P. Robinson and H. Baden Pritchard, editor of the Photographic News. In 1924, Robinson's acquisitions, three heliographic reproductions and one print of the Cardinal were presented to the Royal Photographic Society by his son. The Society, in turn, lent them to the Science Museum, South Kensington, for exhibition. Pritchard had bought the camera picture, the second print of the Cardinal, and Niépce's manuscript memoir Notice sur L'Heliographie. They were the far more important relics, but the new owner was to enjoy his treasure only briefly, for a fortnight after the auction he died of a heart attack...Both Mr. Pritchard's widow and Mr. Robinson exhibited their treasures at the International Inventions Exhibition in London in 1885 and at the great retrospective Crystal Palace Photographic Exhibition in London in 1898.*

*..... we could find no further trace of the Pritchard items after 1898. In the hope of obtaining information from a descendant, or anyone else who might have acquired the treasure meanwhile, I sent a letter to The Times in April 1948, giving a brief history of the sequence we had established. Unfortunately, my appeal was ignored, as was a more urgent request in January 1950. Not long afterwards the art editor of The Observer made contact with me over my rediscovery of Lewis Carroll's hobby<sup>6</sup>, which caused a sensation in art and literary circles. He immediately agreed to support my appeal concerning the lost Niépce treasure. Its publication in April 1950 brought an immediate reply from Mr. Pritchard's son, a piece of luck, considering that no less than four Sunday papers are published in London. Mr. Pritchard remembered the Niépce relics, but asserted they had not been returned to his mother after the exhibition in 1898. Whether they had got lost or had been stolen he was unable to say, but he remembered how upset his mother had been. ...*

*A year and a half passed. We were in the middle of preparations for the historical section of the World Exhibition of Photography in Lucerne, Switzerland, when one day my wife came running to me in great excitement, holding a piece of paper in the air, like Chamberlain in 1938, and shouted in triumph: "'The Niépce's photographs have been found,' writes Mrs. Pritchard." Dumbfounded I read that her husband had died some months before. Going through his estate, a big trunk that had been in a London depository since 1917 had to be opened. Among old clothes, books and other family relics belonging to his mother (who had died in 1917) Mrs. Pritchard had found the Niépce items I had been searching for. She regretted to have to tell me that the picture had completely faded. There was nothing to be seen.*

---

<sup>6</sup> Lewis Carroll (Rev. Charles Lutwidge Dodgson) was one of the leading amateur photographers in the middle of the 19<sup>th</sup> Century working in the wet collodion process. See <http://www.lewis Carroll.org/photo.html>



*The First Photograph, housed in its original presentational frame and sealed within an atmosphere of inert gas in an airtight steel and Plexiglas storage frame, must be viewed under controlled lighting in order for its image to be visible.*

*Impatient to see the treasure trove for myself, for I knew that a bitumen picture could not fade, I telephoned to inquire when I could come. A lady companion answered that Mrs. Pritchard was in bed with a cold, but would write to me as soon as she was well again. A month passed. At last came the day which I shall never forget: 14 February 1952...*

*During lunch I had to tell the ladies about my collection, how I found the [Lewis] Carroll albums, and what had given me the idea to search for the Niépce pictures.....*

After some more small-talk...

*Reading my thoughts Mrs. Pritchard got up, handed me a handsome mirror in a broad gold frame and said: "That's it. You will be disappointed, but I had warned you that there was nothing left of a picture."*

*I was startled. I had not expected a looking glass, nor an Empire frame in which the pewter plate lay like a painting. I went to the window, held the plate at an angle to the light, as one does with daguerreotypes. No image was to be seen. Then I increased the angle--and suddenly the entire courtyard scene unfolded itself in front of my eyes. The ladies were speechless. Was I practicing black magic on them? Then I turned the picture and read Francis Bauer's French and English inscription:*

*"Monsieur Niépce's first successful experiment of fixing permanently the image from Nature," and the date below, 1827. Only a historian can understand my feeling at that moment. I had reached the goal of my*



*research and held the foundation stone of photography in my hand. I felt myself in communication with Niépce. "Your nightmare existence in a trunk is over," I thought. "[George] Potonniée was right. At long last you will be recognized as the inventor of photography. This picture will prove it to all the world."*

*The reverse showing Bauer's label<sup>7</sup>*

Then Mrs Pritchard asked why Gernsheim said 1826 when the label on the back said 1827?

*" I explained that 1827 was the date of presentation to the Royal Society, and the handwriting that of Bauer, not Niépce. If the picture was taken on a pewter plate... the date is almost certainly 1826. For in that year Niépce had bought his first professional camera and pewter plates. He was anxious to try them out, and why should he have waited for a year before making an experiment? Moreover, we know that his best reproduction ever, the Cardinal, was taken in 1826 on a pewter plate, and so I see no reason to assume that this view was made later."*

---

<sup>7</sup> The inscription reads: *L'Héliographie. Les premiers resultants obtenus Spontanément par l'action de la lumière. Par Monsieur Niépce De Chalonsur Saone. 1827* Monsieur Niépce's first successful experiment of fixing permanently the Image from Nature.

To explain some of the above, in September 1827, Niépce went to London where his brother Claude was very ill and while there, met the famous botanist, Francis Bauer FRS. He showed the great man some of his "heliographs" and Bauer was so impressed, he advised Niépce to write a "memoir" and gave him letters of introduction to the Royal Society. However, the Royal Society returned his work, refusing to acknowledge processes the details of which were not disclosed. Before Niépce left England he gave Bauer his manuscript and some of his heliographs,



including the First Photograph. Bauer wrote the details of the gift on the back of the Photograph and dated it 1827, the year in which he received it.

*Un-retouched color reproduction of the First Photograph. Harry Ransom Center and J. Paul Getty Museum. Color digital print reproduction*

Another point of explanation: The First Photograph is not easy to view or, as all attempts have shown, to photograph. Now on exhibition in the University of Texas it is housed in its original presentational frame and sealed within an atmosphere of inert gas in an airtight steel and Plexiglas storage frame. Even so, it must be viewed under controlled lighting in order for its image to be visible. The reproduction we see is based on a photograph taken only with great difficulty and retouched in many places. The grainy appearance in the photographic reproduction is not visible in the original but is a product of the surface when photographed under directional lighting.

Finally, the heliograph of Cardinal d'Amboise was a photoengraving taken from a pewter plate which had been coated with the bitumen of Judea varnish; on this plate, Niépce had placed an engraving of the Cardinal, made translucent presumably by oiling it, and exposed for hours in direct sunlight. In this case, no camera was involved. In Niépce's eyes, this was his most successful attempt to produce a useful image.

## From Heliography to the Daguerrotype

Claude Niépce died in England two weeks after his brother arrived home in France. This threw all responsibility for running Le Gras as well as administering the Pyreolophore enterprise onto Nicéphore's shoulders. In fact, funds had long run out and it was obvious the fuel-injected internal combustion engine had to be abandoned. Putting his brother's affairs in order and doing the best he could with the estate, occupied the next two years for Niépce and he did not resume his experiments until 1828.

Niépce had earlier used home-made cameras for his experiments but in 1826, he ordered a professionally-made camera from the Paris optics firm, Chevaliers. The order was actually placed by Niépce's cousin, Colonel Niépce, who explained his cousin's interest and showed the Chevaliers examples of his heliographs. The Chevaliers were greatly impressed and later mentioned what they had seen to a Paris scene-painter and panoramist, Louis Jacques Mandé Daguerre.

Daguerre had himself been experimenting with *camera obscurae* using paper impregnated with silver chloride and with phosphorus, but was unable to fix the images he obtained. On the advice of the Chevaliers, Daguerre wrote to Niépce who seems to have been suspicious of him and, only after Daguerre had importuned him for 16 months, finally relented and sent him one of his heliographs in exchange for what Daguerre called a *dessin fumée*, a "smoked drawing". As it turned out, the *dessin fumée* was a fake, but broke and wanting to further his experiments — and to jump ahead of history for a moment — Niépce finally gave in and on 14 December 1829 signed a ten year partnership deal with Daguerre. This was a very one-sided deal: Daguerre scientifically had nothing of substance to offer, while Niépce generously handed over all his hard-won secrets.

After his brother Claude's death, Niépce had resumed his experiments in May 1828. He bought a new and improved achromatic lens, hoping it would reduce his exposure times. On 28 August of that year he wrote to Lemaître:

*I have now entirely given up copying engravings, and restrict myself to views taken with the perfected camera obscura of Wollaston. The periscopic lenses have given results much superior to those which I obtained with ordinary lenses, and even with the meniscus prism of V. Chevalier. My sole object having become to copy nature with the greatest fidelity, it is to that which I attach myself exclusively, for only when I have succeeded with this, can I seriously occupy myself with the different modes of application of which my discovery is capable<sup>8</sup>.*

---

<sup>8</sup> See Gernsheim, op. cit. p 37.

Using his improved lens and replacing the pewter plates he had used for the First Photograph with silver-plated copper plates, he began a new series of experiments. In 1829 he discovered if he fumed the silver-plated copper plate with iodine, it gave him much better contrast than did the bitumen of Judea on the bare metal. In this case, the bitumen which had been exposed to light hardened and was not washed off by the turpentine as was the unhardened bitumen representing the shadow areas. The remaining, hardened bitumen effectively masked the silver beneath it from the effects of the iodine vapour so that when the whole plate was washed in alcohol, all traces of the bitumen were removed, the shadows were shown by the blackened silver and the highlights by the shiny parts of the plate. A further advantage was that the copper beneath was hard enough to be used for etching if it was later desired.

Despite the advantages of this new process, exposure times were still far too long for practical use. Perhaps one of the reasons he was finally persuaded to enter into partnership with Daguerre was that his friend, Lemaître, had advised him the only way to improve exposure times was to get a better camera, such as the one used by M. Daguerre. As it turned out, Daguerre's camera was only the Wollaston model the same as the camera Niépce had been using for the past twelve months, although it did have a better lens, an achromatic one made for Daguerre by the Chevaliers. The partnership, called Niépce-Daguerre when the contract was signed, gradually shifted its emphasis until finally, it was Daguerrotypes which swept the world even though it was Niépce's discoveries which made it possible.

Joseph Nicéphore Niépce died in 1833 at the age of 68, before his process was brought to perfection. His widow and son had to sell Le Gras — as Gernsheim<sup>9</sup> says, *A life's work and a great deal of money had been lavished on an idea*, although the family fortune had actually been spent on two ideas, photography and the fuel-injected internal combustion engine. It was for others to reap Niépce's reward.

---

<sup>9</sup> Op cit, p. 38.