

WERGE JOHN

THE

EVOLUTION OF

PHOTOGRAPHY

John Werge

The Evolution of Photography

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Werge J.

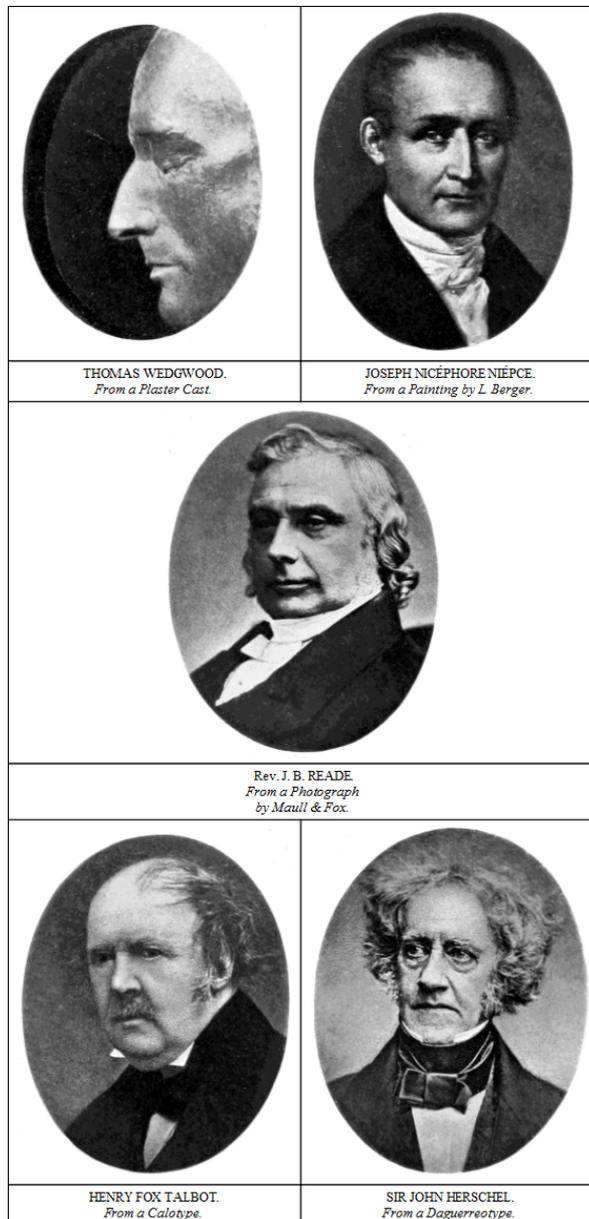
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active 1854-1890 John Werge
The Evolution of Photography / With
a Chronological Record of Discoveries,
Inventions, Etc., Contributions to
Photographic Literature, and Personal
Reminiscences Extending over Forty Years

FIRST PERIOD. PAPER, ASPHALTUM, &c



PREFACE



No previous history of photography, that I am aware of, has ever assumed the form of a reminiscence, nor have I met with a photographic work, of any description, that is so strictly built upon a chronological foundation as the one now placed in the hands of the reader. I therefore think, and trust, that it will prove to be an acceptable and readable addition to photographic literature.

It was never intended that this volume should be a text-book, so I have not entered into elaborate descriptions of the manipulations of this or that process, but have endeavoured to make it a comprehensive and agreeable summary of all that has been done in the past, and yet convey a perfect knowledge of all the processes as they have appeared and effected radical changes in the practice of photography.

The chronological record of discoveries, inventions, appliances, and publications connected with the art will, it is hoped, be received and considered as a useful and interesting table of reference; while the reminiscences, extending over forty years of unbroken contact with every phase of photography, and some of its pioneers, will form a vital link between the long past and immediate present, which may awaken pleasing recollections in some, and give encouragement to others to enter the field of experiment, and endeavour to continue the work of evolution.

At page 10 it is stated, on the authority of the late Robert Hunt, that some of Niépce's early pictures may be seen at the British Museum. That was so, but unfortunately it is not so now. On making application, very recently, to examine these pictures, I ascertained that they were never placed in the care of the curator of the British Museum, but were the private property of the late Dr. Robert Brown, who left them to his colleague, John Joseph Bennett, and that at the latter's death they passed into the possession of his widow. I wrote to the lady making enquiries about them, but have not been able to trace them further; there are, however, two very interesting examples of Niépce's heliographs, and one photo-etched plate and print, lent by Mr. H. P. Robinson, on view at South Kensington, in the Western Gallery of the Science Collection.

For the portrait of Thomas Wedgwood, I am indebted to Mr. Godfrey Wedgwood; for that of Joseph Nicéphore Niépce, to the Mayor of Chalons-sur-Saône; for the Rev. J. B. Reade's, to Mr. Fox; for Sir John Herschel's, to Mr. H. H. Cameron; for John Frederick Goddard's, to Dr. Jabez Hogg; and for Frederick Scott Archer's, to Mr. Alfred Cade; and to all those gentlemen I tender my most grateful acknowledgments. Also to the Autotype Company, for their care and attention in carrying out my wishes in the reproduction of all the illustrations by their beautiful Collotype Process.

JOHN WERGE.

London, June, 1890.

INTRODUCTION

Photography, though young in years, is sufficiently aged to be in danger of having much of its early history, its infantile gambols, and vigorous growth, obscured or lost sight of in the glitter and reflection of the brilliant success which surrounds its maturity. Scarcely has the period of an average life passed away since the labours of the successful experimentalists began; yet, how few of the present generation of workers can lay their fingers on the dates of the birth, christening, and phases of the delightful vocation they pursue. Many know little or nothing of the long and weary travail the minds of the discoverers suffered before their ingenuity gave birth to the beautiful art-science by which they live. What form the infant art assumed in the earlier stages of its life; or when, where, and how, it passed from one phase to another until it arrived at its present state of mature and profitable perfection. Born with the art, as I may say, and having graduated in it, I could, if I felt so disposed, give an interesting, if not amusing, description of its rise and progress, and the many difficulties and disappointments that some of the early practitioners experienced at a time when photographic A B C's were not printed; its "principles and practice" anything but familiarly explained; and when the "dark room" was as dark as the grave, and as poisonous as a charnel-house, and only occasionally illumined by the glare of a "bull's-eye." But it is not my intention to enter the domain of romance, and give highly coloured or extravagant accounts of the growth of so beautiful and fascinating an art-science. Photography is sufficiently facetious in itself, and too versatile in its powers of delineation of scenes and character, to require any verbose effort of mine to make it attractive. A record of bare facts is all I aim at. Whatever is doubtful I shall leave to the imagination of the reader, or the invention of the romance writer. To arrange in chronological order the various discoveries, inventions, and improvements that have made photography what it is; to do honour to those who have toiled and given, or sold, the fruits of their labour for the advancement of the art; to set at rest, as far as dates can succeed in doing so, any questionable point or order of precedence of merit in invention, application, or modification of a process, and to enable the photographic student to make himself acquainted with the epochs of the art, is the extent of my ambition in compiling these records.

With the hope of rendering this work readily referable and most comprehensive, I shall divide it into four periods. The first will deal broadly and briefly with such facts as can be ascertained that in any way bear on the accidental discovery, early researches, and ultimate success of the pioneers of photography.

The second will embrace a fuller description of their successes and results. The third will be devoted to a consideration of patents and impediments; and the fourth to the rise and development of photographic literature and art. A strict chronological arrangement of each period will be maintained, and it is hoped that the advantages to be derived from travelling some of the same ground over again in the various divisions of the subject will fully compensate the reader, and be accepted as sufficient excuse for any unavoidable repetition that may appear in the work. With these few remarks I shall at once enter upon the task of placing before the reader in chronological order the origin, rise, progress, and development of the science and art of photography.

FIRST PERIOD

THE DARK AGES

More than three hundred years have elapsed since the influence and actinism of light on chloride of silver was observed by the alchemists of the sixteenth century. This discovery was unquestionably the first thing that suggested to the minds of succeeding chemists and men of science the possibility of obtaining pictures of solid bodies on a plane surface previously coated with a silver salt by means of the sun's rays; but the alchemists were too much absorbed in their vain endeavours to convert the base metals into royal ones to seize the hint, and they lost the opportunity of turning the silver compounds with which they were acquainted into the mine of wealth it eventually became in the nineteenth century. Curiously enough, a mechanical invention of the same period was afterwards employed, with a very trifling modification, for the production of the earliest sun-pictures. This was the camera-obscura invented by Roger Bacon in 1297, and improved by a physician in Padua, Giovanni Baptista Porta, about 1500, and afterwards remodelled by Sir Isaac Newton.

Two more centuries passed away before another step was taken towards the revelation of the marvellous fact that Nature possessed within herself the power to delineate her own beauties, and, as has recently been proved, that the sun could depict his own terrible majesty with a rapidity and fidelity the hand of man could never attain. The second step towards this grand achievement of science was the construction of the double achromatic combination of lenses by J. Dolland. With single combinations of lenses, such pictures as we see of ourselves to-day, and such portraits of the sun as the astronomers obtained during the late total eclipse, could never have been produced. J. Dolland, the eminent optician, was born in London 1706, and died 1762; and had he not made that important improvement in the construction of lenses, the eminent photographic opticians of the present day might have lived and died unknown to wealth and fame.

The observations of the celebrated Swedish chemist, Scheele, formed the next interesting link between the simple and general blackening of a lump of chloride of silver, and the gradations of blackening which ultimately produced the photographic picture on a piece of paper possessing a prepared surface of nitrate of silver and chloride of sodium in combination. Scheele discovered in 1777 that the blackening of the silver compound was due to the reducing power of light, and that the black deposit was *reduced silver*; and it is precisely the same effect of the action of light upon chloride of silver passing through the various densities of the negative that produces the beautiful photographic prints with which we are all familiar at the present time. Scheele was also the first to discover and make known the fact that chloride of silver was blackened or reduced to various depths by the varying action of the prismatic colours. He fixed a glass prism in a window, allowed the refracted sunbeams to fall on a piece of paper strewn with *luna cornua*—fused chloride of silver—and saw that the violet ray was more active than any of the other colours. Anyone, with a piece of sensitised paper and a prism, or piece of a broken lustre, can repeat and see for themselves Scheele's interesting discovery; and anyone that can draw a head or a flower may catch a sunbeam in a small magnifying glass, and make a drawing on sensitised paper with a pencil, as long as the sun is distant from the earth. It is the old story of Columbus and the egg—easy to do when you are shown or told how.

Charles William Scheele was born at Stralsund, Sweden, December 19th, 1742, and died at Koepping, on lake Moeler, May 21st, 1786. He was the real father of photography, for he produced the first photographic picture on record without camera and without lens, with the same chemical compound and the same beautiful and wonderful combination of natural colours which we now

employ. Little did he dream what was to follow. But photography, like everything else in this world, is a process of evolution.

Senebier followed up Scheele's experiments with the solar spectrum, and ascertained that chloride of silver was darkened by the violet ray in fifteen minutes, while the red rays were sluggish, and required twenty minutes to produce the same result.

John Wm. Ritter, born at Samitz, in Silesia, corroborated the experiments of Scheele, and discovered that chloride of silver was blackened beyond the spectrum on the violet side. He died in 1810; but he had observed what is now called the fluorescent rays of the spectrum—invisible rays which unquestionably exert themselves in the interests and practice of photography.

Many other experiments were made by other chemists and philosophers on the influence of light on various substances, but none of them had any direct bearing on the subject under consideration until Count Rumford, in 1798, communicated to the Royal Society his experiments with chloride of gold. Count Rumford wetted a piece of taffeta ribbon with a solution of chloride of gold, held it horizontally over the clear flame of a wax candle, and saw that the heat decomposed the gold solution, and stained the ribbon a beautiful purple. Though no revived gold was visible, the ribbon appeared to be coated with a rich purple enamel, which showed a metallic lustre of great brilliancy when viewed in the sunlight; but its photographic value lay in the circumstance of the hint it afterwards afforded M. Fizeau in applying a solution of chloride of gold, and, by means of heat, depositing a fine film of metallic gold on the surface of the Daguerreotype image, thereby increasing the brilliancy and permanency of that form of photographic picture. A modification of M. Fizeau's chloride of gold "fixing process" is still used to tone, and imparts a rich purple colour to photographic prints on plain and albumenized papers.

In 1800, Dr. Herschel's "Memoirs on the Heating Power of the Solar Spectrum" were published, and out of his observations on the various effects of differently coloured darkening glasses arose the idea that the chemical properties of the prismatic colours, and coloured glass, might be as different as those which related to heat and light. His suspicions were ultimately verified, and hence the use of yellow or ruby glass in the windows of the "dark room," as either of those coloured glasses admit the luminous ray and restrain the violet or active photographic ray, and allow all the operations that would otherwise have to be performed in the dark, to be seen and done in comfort, and without injury to the sensitive film.

The researches of Dr. Wollaston, in 1802, had very little reference to photography beyond his examination of the chemical action of the rays of the spectrum, and his observation that the yellow stain of gum guaiacum was converted to a green colour in the violet rays, and that the red rays rapidly destroyed the green tint the violet rays had generated.

1802 is, however, a memorable year in the dark ages of photography, and the disappointment of those enthusiastic and indefatigable pursuers of the sunbeam must have been grievous indeed, when, after years of labour, they found the means of catching shadows as they fell, and discovered that they could not keep them.

Thomas Wedgwood, son of the celebrated potter, was not only the first that obtained photographic impressions of objects, but the first to make the attempt to obtain sun-pictures in the true sense of the word. Scheele had obtained the first photographic picture of the solar spectrum, but it was by accident, and while pursuing other chemical experiments; whereas Wedgwood went to work avowedly to make the sunbeam his slave, to enlist the sun into the service of art, and to compel the sun to illustrate art, and to depict nature more faithfully than art had ever imitated anything illumined by the sun before. How far he succeeded everyone should know, and no student of photography should ever tire of reading the first published account of his fascinating pastime or delightful vocation, if it were but to remind him of the treasures that surround him, and the value of hyposulphite of soda. What would Thomas Wedgwood not have given for a handful of that now common commodity? There is a mournfulness in the sentence relative to the evanescence of those sun-pictures in the Memoir

by Wedgwood and Davy that is peculiarly impressive and desponding contrasted with our present notions of instability. We know that sun-pictures will, at the least, last for years, while they knew that at the most they would endure but for a few hours. The following extracts from the Memoir published in June, 1802, will, it is hoped, be found sufficiently interesting and in place here to justify their insertion.

“White paper, or white leather moistened with solution of nitrate of silver, undergoes no change when kept in a dark place, but on being exposed to the daylight it speedily changes colour, and after passing through different shades of grey and brown becomes at length nearly black.... In the direct beams of the sun, two or three minutes are sufficient to produce the full effect, in the shade several hours are required, and light transmitted through different coloured glasses acts upon it with different degrees of intensity. Thus it is found that red rays, or the common sunbeams passed through red glass, have very little action upon it; yellow and green are more efficacious, but blue and violet light produce the most decided and powerful effects.... When the shadow of any figure is thrown upon the prepared surface, the part concealed by it remains white, and the other parts speedily become dark. For copying paintings on glass, the solution should be applied on leather, and in this case it is more readily acted on than when paper is used. After the colour has been once fixed on the leather or paper, it cannot be removed by the application of water, or water and soap, and it is in a high degree permanent. The copy of a painting or the profile, immediately after being taken, must be kept in an obscure place; it may indeed be examined in the shade, but in this case the exposure should be only for a few minutes; by the light of candles or lamps as commonly employed it is not sensibly affected.

“No attempts that have been made to prevent the uncoloured parts of the copy or profile from being acted upon by the light have as yet been successful. They have been covered by a thin coating of fine varnish, but this has not destroyed their susceptibility of becoming coloured, and even after repeated washings, sufficient of the active part of the saline matter will adhere to the white parts of leather or paper to cause them to become dark when exposed to the rays of the sun....

“The images formed by means of a camera-obscura have been found to be too faint to produce, in any moderate time, an effect upon the nitrate of silver. To copy these images was the first object of Mr. Wedgwood, in his researches on the subject, and for this purpose he first used the nitrate of silver, which was mentioned to him by a friend, as a substance very sensible to the influence of light; but all his numerous experiments as to their primary end proved unsuccessful.”

From the foregoing extracts from the first lecture on photography that ever was delivered or published, it will be seen that those two eminent philosophers and experimentalists despaired of obtaining pictures in the camera-obscura, and of rendering the pictures obtained by superposition, or cast shadows, in any degree permanent, and that they were utterly ignorant and destitute of any fixing agents. No wonder, then, that all further attempts to pursue these experiments should, for a time, be abandoned in England. Although Thomas Wedgwood's discoveries were not published until 1802, he obtained his first results in 1791, and does not appear to have made any appreciable advance during the remainder of his life. He was born in 1771, and died in 1805. Sir Humphry Davy was born at Penzance 1778, and died at Geneva in 1828, so that neither of them lived to see the realization of their hopes.

From the time that Wedgwood and Davy relinquished their investigation, the subject appears to have lain dormant until 1814, when Joseph Nicéphore Niépce, of Chalons-sur-Saône, commenced a series of experiments with various resins, with the object of securing or retaining in a permanent state the pictures produced in the camera-obscura, and in 1824, L. J. M. Daguerre turned his attention to the same subject. These two investigators appear to have carried on their experiments in different ways, and in total ignorance of the existence and pursuits of the other, until the year 1826, when they accidentally became acquainted with each other and the nature of their investigations. Their introduction and reciprocal admiration did not, however, induce them to exchange their ideas, or reveal the extent of their success in the researches on which they were occupied, and which both

were pursuing so secretly and guardedly. They each preserved a marked reticence on the subject for a considerable time, and it was not until a deed of partnership was executed between them that they confided their hopes and fears, their failures with this substance, and their prospects of success with that; and even after the execution of the deed of partnership they seem to have jealously withheld as much of their knowledge as they decently could under the circumstances.

Towards the close of 1827 M. Niépce visited England, and we receive the first intimation of his success in the production of light-drawn pictures from a note addressed to Mr. Bauer, of Kew. It is rather curious and flattering to find that the earliest intimation of the Frenchman's success is given in England. The note which M. Niépce wrote to Mr. Bauer is in French, but the following is a translation of the interesting announcement:—"Kew, 19th November, 1827. Sir,—When I left France to reside here, I was engaged in researches on the way to retain the image of objects by the action of light. I have obtained some results which make me eager to proceed.... Nicéphore Niépce." This is the first recorded announcement of his partial success.

In the following December he communicated with the Royal Society of London, and showed several pictures on metal plates. Most of these pictures were specimens of his successful experiments with various resins, and the subjects were rendered visible to the extent which the light had assisted in hardening portions of the resin-covered plates. Some were etchings, and had been subjected to the action of acid after the design had been impressed by the action of light. Several of these specimens, I believe, are still extant, and may be seen on application to the proper official at the British Museum. M. Niépce named these results of his researches Heliography, and Mr. Robert Hunt gives their number, and a description of each subject, in his work entitled, "Researches on Light." M. Niépce met with some disappointment in England on account of the Royal Society refusing to receive his communication as a secret, and he returned to France rather hurriedly. In a letter dated "Chalons-sur-Saône, 1st March, 1828," he says, "We arrived here 26th February"; and, in a letter written by Daguerre, February 3rd, 1828, we find that savant consoling his brother experimentalist for his lack of encouragement in England.

In December, 1829, the two French investigators joined issue by executing a deed of co-partnery, in which they agreed to prosecute their researches in future in mutual confidence and for their joint advantage; but their interchange of thought and experience does not appear to have been of much value or advantage to the other; for an examination of the correspondence between MM. Niépce and Daguerre tends to show that the one somewhat annoyed the other by sticking to his resins, and the other one by recommending the use of iodine. M. Niépce somewhat ungraciously expresses regret at having wasted so much time in experimenting with iodine at M. Daguerre's suggestion, but ultimate results fully justified Daguerre's recommendation, and proved that he was then on the right track, while M. Niépce's experiments with resins, asphaltum, and other substances terminated in nothing but tedious manipulations, lengthy exposures, and unsatisfactory results. To M. Niépce, most unquestionably, is due the honour of having produced the first permanent sun-pictures, for we have seen that those obtained by Wedgwood and Davy were as fleeting as a shadow, while those exhibited by M. Niépce in 1827 are still in their original condition, and, imperfect as they are, they are likely to retain their permanency for ever. Their fault lay in neither possessing beauty nor commercial applicability.

As M. Niépce died at Chalons-sur-Saône in 1833, and does not appear to have improved his process much, if any, after entering into partnership with M. Daguerre, and as I may not have occasion to allude to him or his researches again, I think this will be the most fitting place to give a brief description of his process, and his share in the labours of bringing up the wonderful baby of science, afterwards named Photography, to a safe and ineffaceable period of its existence.

The Heliographic process of M. Niépce consists of a solution of asphaltum, bitumen of Judea, being spread on metal or glass plates, submitted to the action of light either by superposition or in the camera, and the unaffected parts dissolved away afterwards by means of a suitable solvent. But,

in case any student of photography should like to produce one of the first form of permanent sun-pictures, I shall give here the details of M. Niépce's own *modus operandi* for preparing the solution of bitumen and coating the plate:—

“I about half fill a wine-glass with this pulverised bitumen; I pour upon it, drop by drop, the essential oil of lavender until the bitumen is completely saturated. I afterwards add as much more of the essential oil as causes the whole to stand about three lines above the mixture, which is then covered and submitted to a gentle heat until the essential oil is fully impregnated with the colouring matter of the bitumen. If this varnish is not of the required consistency, it is to be allowed to evaporate slowly, without heat, in a shallow dish, care being taken to protect it from moisture, by which it is injured and at last decomposed. In winter, or in rainy weather, the precaution is doubly necessary. A tablet of plated silver, or well cleaned and warm glass, is to be highly polished, on which a thin coating of the varnish is to be applied cold, with a light roll of very soft skin; this will impart to it a fine vermilion colour, and cover it with a very thin and equal coating. The plate is then placed upon heated iron, which is wrapped round with several folds of paper, from which, by this method, all moisture had been previously expelled. When the varnish has ceased to simmer, the plate is withdrawn from the heat, and left to cool and dry in a gentle temperature, and protected from a damp atmosphere. In this part of the operation a light disc of metal, with a handle in the centre, should be held before the mouth, in order to condense the moisture of the breath.”

In the foregoing description it will be observed how much importance M. Niépce attached to the necessity of protecting the solution and prepared plate from moisture, and that no precautions are given concerning the effect of white light. It must be remembered, however, that the material employed was very insensitive, requiring many hours of exposure either in the camera or under a print or drawing placed in contact with the prepared surface, and consequently such precaution might not have been deemed necessary. Probably M. Niépce worked in a subdued light, but there can be no doubt about the necessity of conducting both the foregoing operations in yellow light. Had M. Niépce performed his operations in a non-actinic light, the plates would certainly have been more sensitive, and the unacted-on parts would have been more soluble; thus rendering both the time of exposure and development more rapid.

After the plate was prepared and dried, it was exposed in the camera, or by superposition, under a print, or other suitable subject, that would lie flat. For the latter, an exposure of two or three hours in bright sunshine was necessary, and the former required six or eight hours in a strong light. Even those prolonged exposures did not produce a visible image, and the resultant picture was not revealed to view until after a tedious process of dissolving, for it could scarcely be called development. M. Niépce himself says, “The next operation then is to disengage the *shrouded* imagery, and this is accomplished by a solvent.” The solvent consisted of one measure of the essential oil of lavender and ten of oil of white petroleum or benzole. On removing the tablet from the camera or other object, it was plunged into a bath of the above solvent, and left there until the parts not hardened by light were dissolved. When the picture was fully revealed, it was placed at an angle to drain, and finished by washing it in water.

Except for the purpose of after-etching, M. Niépce's process was of little commercial value then, but it has since been of some service in the practice of photo-lithography. That, I think, is the fullest extent of the commercial or artistic advantages derived from the utmost success of M. Niépce's discoveries; but what he considered his failures, the fact that he employed copper plates coated with silver for his heliographic tablets, and endeavoured to darken the clean or clear parts of the silvered plates with the fumes of iodine for the sake of contrast only, may be safely accepted as the foundation of Daguerre's ultimate success in discovering the extremely beautiful and workable process known as the Daguerreotype.

M. Niépce appears to have done very little more towards perfecting the heliographic process after joining Daguerre; but the latter effected some improvements, and substituted for the bitumen

of Judea the residuum obtained by evaporating the essential oil of lavender, without, however, attaining any important advance in that direction. After the death of M. Nicéphore Niépce, a new agreement was entered into by his son, M. Isidore Niépce, and M. Daguerre, and we must leave those two experimentalists pursuing their discoveries in France while we return to England to pick up the chronological links that unite the history of this wonderful discovery with the time that it was abandoned by Wedgwood and Davy, and the period of its startling and brilliant realization.

In 1834, Mr. Henry Fox Talbot, of Lacock Abbey, Wilts, “began to put in practice,” as he informs us in his memoir read before the Royal Society, a method which *he* “had *devised* some time previously, for employing to purposes of utility the very curious property which has been long known to chemists to be possessed by the nitrate of silver—namely, to discolouration when exposed to the violet rays of light.” The statement just quoted places us at once on the debateable ground of our subject, and compels us to pause and consider to what extent photography is indebted to Mr. Talbot for its further development at this period and five years subsequently. In the first place, it is not to be supposed for a moment that a man of Mr. Talbot’s position and education could possibly be ignorant of what had been done by Mr. Thomas Wedgwood and Sir Humphry Davy. Their experiments were published in the *Journal of the Royal Institution of Great Britain* in June, 1802, and Mr. Talbot or some of his friends could not have failed to have seen or heard of those published details; and, in the second place, a comparison between the last records of Wedgwood and Davy’s experiments, and the first published details of Mr. Talbot’s process, shows not only that the two processes are identically the same, but that Mr. Talbot published his process before he had made a single step in advance of Wedgwood and Davy’s discoveries; and that his fixing solution was not a fixer at all, but simply a retardant that delayed the gradual disappearance of the picture only a short time longer. Mr. Talbot has generally been credited with the honour of producing the first permanent sun-pictures on paper; but there are grave reasons for doubting the justice of that honour being entirely, if at all, due to him, and the following facts and extracts will probably tend to set that question at rest, and transfer the laurel to another brow.

To the late Rev. J. B. Reade is incontestably due the honour of having first applied tannin as an accelerator, and hyposulphite of soda as a fixing agent, to the production and retention of light-produced pictures; and having first obtained an ineffaceable photograph upon paper. Mr. Talbot’s gallate of silver process was not patented or published till 1841; whereas the Rev. J. B. Reade produced paper negatives by means of gallic acid and nitrate of silver in 1837. It will be remembered that Mr. Wedgwood had discovered and stated that the chloride of silver was more sensitive when applied to white leather, and Mr. Reade, by inductive reasoning, came to the conclusion that tanned paper and silver would be more sensitive to light than ordinary paper coated with nitrate of silver could possibly be. As the reverend philosopher’s ideas on that subject are probably the first that ever impregnated the mind of man, and as his experiments and observations are the very earliest in the pursuit of a gallic acid accelerator and developer, I will give them in his own words.—“No one can dispute my claim to be the first to suggest the use of gallic acid as a sensitiser for prepared paper, and hyposulphite of soda as a fixer. These are the keystones of the arch at which Davy and Young had laboured—or, as I may say in the language of another science, we may vary the tones as we please, but here is the fundamental base. My use of gallate of silver was the result of an inference from Wedgwood’s experiments with leather, ‘which is more readily acted upon than paper’ (*Journal of the Royal Institution*, vol. i., p. 171). Mrs. Reade was so good as to give me a pair of light-coloured leather gloves, that I might repeat Wedgwood’s experiment, and, as my friend Mr. Ackerman reminds me, her little objection to let me have a second pair led me to say, ‘Then I will tan paper.’ Accordingly I used an infusion of galls in the first instance in the early part of the year 1837, when I was engaged in taking photographs of microscopic objects. By a new arrangement of lenses in the solar microscope, I produced a convergence of the rays of light, while the rays of heat, owing to their different refractions, were parallel or divergent. This fortunate dispersion of the calorific rays enabled me to use objects

mounted in balsam, as well as cemented achromatic object glasses; and, indeed, such was the coolness of the illumination, that even *infusoria* in single drops of water were perfectly happy and playful (*vide* abstracts of the ‘Philosophical Transactions,’ December 22nd, 1836). The continued expense of an artist—though, at first, I employed my friend, Lens Aldons—to copy the pictures on the screen was out of the question. I therefore fell back, but without any sanguine expectations as to the result, upon the photographic process adopted by Wedgwood, with which I happened to be well acquainted. It was a *weary while*, however, before any satisfactory impression was made, either on chloride or nitrate paper. I succeeded better with the leather; but my fortunate inability to replenish the little stock of this latter article induced me to apply the tannin solution to paper, and thus I was at once placed, by a very decided step, in advance of earlier experimenters, and I had the pleasure of succeeding where Talbot acknowledges that he failed.

“Naturally enough, the solution which I used at first was too strong, but, if you have ever been in what I may call *the agony of a find*, you can conceive my sensations on witnessing the unwilling paper become in a few seconds almost as black as my hat. There was just a passing glimpse of outline, ‘and in a moment all was dark.’ It was evident, however, that I was in possession of all, and more than all, I wanted, and that the dilution of so powerful an accelerator would probably give successful results. The large amount of dilution greatly surprised me; and, indeed, before I obtained a satisfactory picture, the quantity of gallic acid in the infusion must have been quite homœopathic; but this is in exact accordance with modern practice and known laws. In reference to this point, Sir John Herschel, writing from Slough, in April, 1840, says to Mr. Redman, then of Peckham (where I had resided), ‘I am surprised at the weak solution employed, and how, with such, you have been able to get a depth of shadow sufficient for so very sharp a re-transfer is to me marvellous.’ I may speak of Mr. Redmond as a photographic pupil of mine, and at my request, he communicated the process to Sir John, which, ‘on account of the extreme clearness and sharpness of the results,’ to use Sir John’s words, much interested him.

“Dr. Diamond also, whose labours are universally appreciated, first saw my early attempts at Peckham in 1837, and heard of my use of gallate of silver, and was thus led to adopt what Admiral Smyth then called ‘a quick mode of taking bad pictures’; but, as I told the Admiral in reply, he was born a *baby*. Whether our philosophical baby is ‘out of its teens’ may be a question; at all events, it is a very fine child, and handles the pencil of nature with consummate skill.

“But of all the persons who heard of my new accelerator, it is most important to state that my old and valued friend, the late Andrew Ross, told Mr. Talbot how first of all, by means of the solar microscope, I threw the image of the object on prepared paper, and then, while the paper was yet wet, washed it over with the infusion of galls, when a sufficiently dense negative was quickly obtained. In the celebrated trial, “Talbot *versus* Laroche,” Mr. Talbot, in his cross-examination, and in an almost breathless court, acknowledged that he had received this information from Ross, and from that moment it became the unavoidable impression that he was scarcely justified in taking out a patent for applying my accelerator to any known photogenic paper.

“The three known papers were those impregnated with the nitrate, chloride, and the iodide of silver—the two former used by Wedgwood and Young, and the latter by Davy. It is true that Talbot says of the iodide of silver that it is quite insensitive to light, and so it is as he makes it; but when he reduces it to the condition described by Davy—viz., affected by the presence of a little free nitrate of silver—then he must acknowledge, with Davy, that ‘it is far more sensitive to the action of light than either the nitrate or the muriate, and is evidently a distinct compound.’ In this state, also, the infusion of galls or gallic acid is, as we all know, most decided and instantaneous, and so I found it to be in my early experiments. Of course I tried the effects of my accelerator on many salts of silver, but especially upon the iodide, in consequence of my knowledge of Davy’s papers on iodine in the ‘Philosophical Transactions.’ These I had previously studied, in conjunction with my chemical friend, Mr. Hodgson, then of Apothecaries’ Hall. I did not, however, use iodised paper, which is well

described by Talbot in the *Philosophical Magazine* for March, 1838, as a *substitute* for other sensitive papers, but only as one among many experiments alluded to in my letter to Mr. Brayley.

“My pictures were exhibited at the Royal Society, and also at Lord Northampton’s, at his lordship’s request, in April, 1839, when Mr. Talbot also exhibited his. In my letter to Mr. Brayley, I did not describe iodised pictures, and, therefore, it was held that exhibition in the absence of description left the process legally unknown. Mr. Talbot consequently felt justified in taking out a patent for uniting my *known* accelerator with Davy’s *known* sensitive silver compound, adopting my method (already communicated to him) with reference to Wedgwood’s papers, and adding specific improvements in manipulation. Whatever varied opinion may consequently be formed as to the defence of the patent in court, there can be but one as to the skill of the patentee.

“It is obvious that, in the process so conducted by me with the solar microscope, I was virtually *within* my camera, standing between the object and the prepared paper. Hence the exciting and developing processes were conducted under *one operation* (subsequently patented by Talbot), and the fact of a latent image being brought out was not forced upon my attention. I did, however, perceive this phenomenon upon one occasion, after I had been suddenly called away, when taking an impression of the *Trientalis Europaea*—and surprised enough I was, and stood in astonishment to look at it. But with all this, I was only, as the judge said, “*very hot.*” I did not realize the *master fact* that the latent image which had been developed was the basis of photographic manipulation. The merit of this discovery is Talbot’s, and his only, and I honour him greatly for his skill and earlier discernment. I was, indeed, myself fully aware that the image darkened under the influence of my sensitiser, while I placed my hand before the lens of the instrument to stop out the light; and my solar mezzotint, as I then termed it, was, in fact, brought out and perfected under my own eye by the agency of gallic acid in the infusion, rather than by the influence of direct solar action. But the notion of developing a latent image in these microscopic photographs never crossed my mind, even after I had witnessed such development in the *Trientalis Europaea*. My original notion was that the infusion of galls, added to the wet chloride or nitrate paper while the picture was thrown upon it, produced only a new and highly sensitive compound; whereas, by its peculiar and continuous action after the first impact of light on the now sensitive paper, I was also, as Talbot has shown, employing its property of development as well as excitement. My ignorance of its properties was no bar to its action. However, I threw the *ball*, and Talbot caught it, and no man can be more willing than myself to acknowledge our obligations to this distinguished photographer. He compelled the world to listen to him, and he had something worth hearing to communicate; and it is a sufficient return to me that he publicly acknowledged his obligation to me, with reference to what Sir David Brewster calls ‘an essential part of his patent’ (*vide North British Review*, No. 14 article—‘Photography’).

“Talbot did not patent my valuable fixer. Here I had the advantage of having published my use of hyposulphite of soda, which Mr. Hodgson made for me in 1837, when London did not contain an ounce of it for sale. The early operators had no fixer; that was *their fix*; and, so far as any record exists, they got no further in this direction than ‘imagining some experiments on the subject!’ I tried ammonia, but it acted too energetically on the picture itself to be available for the purpose. It led me, however, to the ammonia nitrate process of printing positives, a description of which process (though patented by Talbot in 1843) I sent to a photographic brother in 1839, and a quotation from my letter of that date has already appeared in one of my communications to *Notes and Queries*. On examining Brande’s Chemistry, under the hope of still finding the desired solvent which should have a greater affinity for the simple silver compound on the uncoloured part of the picture than for the portion blackened by light, I happened to see it stated, on Sir John Herschel’s authority, that hyposulphite of soda dissolves chloride of silver. I need not now say that I used this fixer with success. The world, however, would not have been long without it, for, when Sir John himself became a photographer in the following year, he first of all used hyposulphite of ammonia, and then permanently fell back upon the properties of his other compound. Two of my solar microscope negatives, taken in 1837,

and exhibited with several others by Mr. Brayley in 1839 as illustrations of my letter and of his lecture at the London Institution, are now in the possession of the London Photographic Society. They are, no doubt, the earliest examples of the agency of two chemical compounds which will be co-existent with photography itself, viz., gallate of silver and hyposulphite of soda, and my use of them, as above described, will sanction my claim to be the first to take paper pictures rapidly, and to fix them permanently.

“Such is a short account of my contribution to this interesting branch of science, and, in the pleasure of the discovery, I have a sufficient reward.”

These lengthy extracts from the Rev. Mr. Reade’s published letter render further comment all but superfluous, but I cannot resist taking advantage of the opportunity here afforded of pointing out to all lovers of photography and natural justice that the progress of the discovery has advanced to a far greater extent by Mr. Reade’s reasoning and experiments than it was by Mr. Talbot’s ingenuity. The latter, as Mr. Reade observes, only “caught the ball” and threw it into the Patent Office, with some improvements in the manipulations. Mr. Reade generously ascribes all honour and glory to Mr. Talbot for his shrewdness in seizing what he had overlooked, viz., the development of the latent image; but there is a quiet current of rebuke running all through Mr. Reade’s letter about the justice of patenting a known sensitiser and a known accelerator, which he alone had combined and applied to the successful production of a negative on paper. Mr. Talbot’s patent process was nothing more, yet he endeavoured to secure a monopoly of what was in substance the discovery and invention of another. Mr. Talbot was either very precipitate, or ill-advised, to rush to the Patent Office with his modification, and even at this distant date it is much to be regretted that he did so, for his rash act has, unhappily for photography, proved a pernicious precedent. Mr. Reade gave his discoveries to the world freely, and the “pleasure of the discovery” was “a sufficient reward.” All honour to such discoverers. They, and they only, are the true lovers of science and art, who take up the torch where another laid it down, or lost it, and carry it forward another stage towards perfection, without sullyng its brightness or dimming the flame with sordid motives.

The Rev. J. B. Reade lived to see the process *he* discovered and watched over in its embryo state, developed with wondrous rapidity into one of the most extensively applied arts of this marvellous age, and died, regretted and esteemed by all who knew him, December 12th, 1870. Photographers, your occupations are his monument, but let his name be a tablet on your hearts, and his unselfishness your emulation!

The year 1838 gave birth to another photographic discovery, little thought of and of small promise at the time, but out of which have flowed all the various modifications of solar and mechanical carbon printing. This was the discovery of Mr. Mungo Ponton, who first observed and announced the effects of the sun’s rays upon bichromate of potash. But that gentleman was unwise in his generation, and did not patent his discovery, so a whole host of patent locusts fell upon the field of research in after years, and quickly seized the manna he had left, to spread on their own bread. Mr. Mungo Ponton spread a solution of bichromate of potash upon paper, submitted it under a suitable object to the sun’s rays, and told all the world, without charge, that the light hardened the bichromate to the extent of its action, and that the unacted-upon portions could be dissolved away, leaving the object *white* upon a yellow or orange ground. Other experimenters played variations on Mr. Ponton’s bichromate scale, and amongst the performers were M. E. Becquerel, of France, and our own distinguished countryman, Mr. Robert Hunt.

During the years that elapsed between the death of M. Niépce and the period to which I have brought these records, little was heard or known of the researches of M. Daguerre, but he was not idle, nor had he abandoned his iodine ideas. He steadily pursued his subject, and worked with a continuity that gained him the unenviable reputation of a lunatic. His persistency created doubts of his sanity, but he toiled on *solus*, confident that he was not in pursuit of an impossibility, and sanguine of success. That success came, hastened by lucky chance, and early in January, 1839, M. Daguerre announced

the interesting and important fact that the problem was solved. Pictures in the camera-obscura could be, not only seen, but caught and retained. M. Daguerre had laboured, sought, and found, and the bare announcement of his wonderful discovery electrified the world of science.

The electric telegraph could not then flash the fascinating intelligence from Paris to London, but the news travelled fast, nevertheless, and the unexpected report of M. Daguerre's triumph hurried Mr. Talbot forward with a similar statement of success. Mr. Talbot declared his triumph on the 31st of January, 1839, and published in the following month the details of a process which was little, if any, in advance of that already known.

Daguerre delayed the publication of his process until a pension of six thousand francs per annum had been secured to himself, and four thousand francs per annum to M. Isidore Niépce for life, with a reversion of one-half to their widows. In the midst of political and social struggles France was proud of the glory of such a marvellous discovery, and liberally rewarded her fortunate sons of science with honourable distinction and substantial emolument. She was proud and generous to a chivalrous extent, for she pensioned her sons that she might have the "glory of endowing the world of science and of art with one of the most surprising discoveries" that had been made on her soil; and, because she considered that "the invention did not admit of being secured by patent;" but avarice and cupidity frustrated her noble and generous intentions in this country, and England alone was harassed with injunctions and prosecutions, while all the rest of the world participated in the pleasure and profits of the noble gift of France.

In July, 1839, M. Daguerre divulged his secret at the request and expense of the French Government, and the process which bore his name was found to be totally different, both in manipulation and effect, from any sun-pictures that had been obtained in England. The Daguerreotype was a latent image produced by light on an iodised silver plate, and developed, or made visible, by the fumes of mercury; but the resultant picture was one of the most shimmering and vapoury imaginable, wanting in solidity, colour, and firmness. In fact, photography as introduced by M. Daguerre was in every sense a wonderfully shadowy and all but invisible thing, and not many removes from the dark ages of its creation. The process was extremely delicate and difficult, slow and tedious to manipulate, and too insensitive to be applied to portraiture with any prospect of success, from fifteen to twenty minutes' exposure in bright sunshine being necessary to obtain a picture. The mode of proceeding was as follows:—A copper plate with a coating of silver was carefully cleaned and polished on the silvered side, that was placed, silver side downwards, over a vessel containing iodine in crystals, until the silvered surface assumed a golden-yellow colour. The plate was then transferred to the camera-obscura, and submitted to the action of light. After the plate had received the requisite amount of exposure, it was placed over a box containing mercury, the fumes of which, on the application of a gentle heat, developed the latent image. The picture was then washed in salt and water, or a solution of hyposulphite of soda, to remove the iodide of silver, washed in clean water afterwards, and dried, and the Daguerreotype was finished according to Daguerre's first published process.

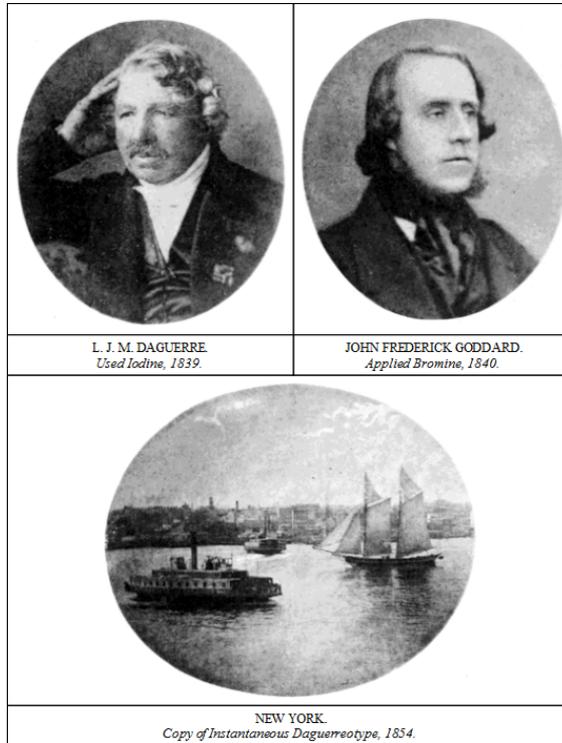
The development of the latent image by mercury subliming was the most marvellous and unlooked-for part of the process, and it was for that all-important thing that Daguerre was entirely indebted to chance. Having put one of his apparently useless iodized and exposed silver plates into a cupboard containing a pot of mercury, Daguerre was greatly surprised, on visiting the cupboard some time afterwards, to find the blank looking plate converted into a visible picture. Other plates were iodized and exposed and placed in the cupboard, and the same mysterious process of development was repeated, and it was not until this thing and the other thing had been removed and replaced over and over again, that Daguerre became aware that quicksilver, an article that had been used for making mirrors and reflecting images for years, was the developer of the invisible image. It was indeed a most marvellous and unexpected result. Daguerre had devoted years of labour and made numberless experiments to obtain a transcript of nature drawn by her own hand, but all his studied efforts and

weary hours of labour had only resulted in repeated failures and disappointments, and it appeared that Nature herself had grown weary of his bungling, and resolved to show him the way.

The realization of his hopes was more accidental than inferential. The compounds with which he worked, neither produced a visible nor a latent image capable of being developed with any of the chemicals with which he was experimenting. At last accident rendered him more service than reasoning, and occult properties produced the effect his mental and inductive faculties failed to accomplish; and here we observe the great difference between the two successful discoverers, Reade and Daguerre. At this stage of the discovery I ignore Talbot's claim in *toto*. Reade arrived at his results by reasoning, experiment, observation, and judiciously weakening and controlling the re-agent he commenced his researches with. He had the infinite pleasure and disappointment of seeing his first picture flash into existence, and disappear again almost instantly, but in that instant he saw the cause of his success and failure, and his inductive reasoning reduced his failure to success; whereas Daguerre *found* his result, was puzzled, and utterly at a loss to account for it, and it was only by a process of blind-man's bluff in his chemical cupboard that he laid his hands on the precious pot of mercury that produced the visible image.

That was a discovery, it is true; but a bungling one, at best. Daguerre only worked intelligently with one-half of the elements of success; the other was thrust in his way, and the most essential part of his achievement was a triumphant accident. Daguerre did half the work—or, rather, one-third—light did the second part, and chance performed the rest, so that Daguerre's share of the honour was only one-third. Reade did two-thirds of the process, the first and third, intelligently; therefore to him alone is due the honour of discovering practical photography. His was a successful application of known properties, equal to an invention; Daguerre's was an accidental result arising from unknown causes and effects, and consequently a discovery of the lowest order. To England, then, and not to France, is the world indebted for the discovery of photography, and in the order of its earliest, greatest, and most successful discoverers and advancers, I place the Rev. J. B. Reade first and highest.

SECOND PERIOD. DAGUERRETYPE



SECOND PERIOD

PUBLICITY AND PROGRESS

1839 has generally been accepted as the year of the birth of Practical Photography, but that may now be considered an error. It was, however, the Year of Publicity, and the progress that followed with such marvellous rapidity may be freely received as an adversely eloquent comment on the principles of secrecy and restriction, in any art or science, like photography, which requires the varied suggestions of numerous minds and many years of experiment in different directions before it can be brought to a state of workable certainty and artistic and commercial applicability. Had Reade concealed his success and the nature of his accelerator, Talbot might have been bungling on with modifications of the experiments of Wedgwood and Davy to this day; and had Daguerre not sold the secret of his iodine vapour as a sensitiser, and his accidentally discovered property of mercury as a developer, he might never have got beyond the vapoury images he produced. As it was, Daguerre did little or nothing to improve his process and make it yield the extremely vigorous and beautiful results it did in after years. As in Mr. Reade's case with the Calotype process, Daguerre threw the ball and others caught it. Daguerre's advertised improvements of his process were lamentable failures and roundabout ways to obtain sensitive amalgams—exceedingly ingenious, but excessively bungling and impractical. To make the plates more sensitive to light, and, as Daguerre said, obtain pictures of objects in motion and animated scenes, he suggested that the silver plate should first be cleaned and polished in the usual way, then to deposit successively layers of mercury, and gold, and platinum. But the process was so tedious, unworkable, and unsatisfactory, no one ever attempted to employ it either commercially or scientifically. In publishing his first process, with its working details, Daguerre appears to have surrendered all that he knew, and to have been incapable of carrying his discovery to a higher degree of advancement. Without Mr. Goddard's bromine accelerator and M. Fizeau's chloride of gold fixer and invigorator, the Daguerreotype would never have been either a commercial success or a permanent production.

1840 was almost as important a period in the annals of photography as the year of its enunciation, and to the two valuable improvements and one interesting importation, the Daguerreotype process was indebted for its success all over the world; and photography, even as it is practised now, is probably indebted for its present state of advancement to Mr. John Frederick Goddard, who applied bromine, as an accelerator, to the Daguerreotype process this year. In the early part of the Daguerreotype period it was so insensitive there was very little prospect of being able to take portraits with it through a lens. To meet this difficulty Mr. Wolcott, an American optician, constructed a reflecting camera and brought it to London. It was an ingenious contrivance, but did not fully answer the expectations of the inventor. It certainly did not require such a long exposure with this camera as when the rays from the image or sitter passed through a lens; but, as the sensitised plate was placed *between* the sitter and the reflector, the picture was necessarily small, and neither very sharp nor satisfactory. This was a mechanical contrivance to shorten the time of exposure, which partially succeeded, but it was chemistry, and not mechanics, that effected the desirable result. Both Mr. Goddard and M. Antoine F. J. Claudet, of London, employed chlorine as a means of increasing the sensitiveness of the iodised silver plate, but it was not sufficiently accelerative to meet the requirements of the Daguerreotype process. Subsequently Mr. Goddard discovered that the vapour of bromine, added to that of iodine, imparted an extraordinary degree of sensitiveness to the prepared plate, and reduced the time of sitting from minutes to seconds. The addition of the fumes

of bromine to those of iodine formed a compound of bromo-iodide of silver on the surface of the Daguerreotype plate, and not only increased the sensitiveness, but added to the strength and beauty of the resulting picture, and M. Fizeau's method of precipitating a film of gold over the whole surface of the plate still further increased the brilliancy of the picture and ensured its permanency. I have many Daguerreotypes in my possession now that were made over forty years ago, and they are as brilliant and perfect as they were on the day they were taken. I fear no one can say the same for any of Fox Talbot's early prints, or even more recent examples of silver printing.

Another important event of this year was the importation of the first photographic lens, camera, &c., into England. These articles were brought from Paris by Sir Hussey Vivian, present M.P. for Glamorganshire (1839). It was the first lot of such articles that the Custom House officers had seen, and they were at a loss to know how to classify it. Finally they passed it under the general head of Optical Instruments. Sir Hussey told me this, himself, several years before he was made a baronet. What changes fifty years have wrought even in the duties of Custom House officers, for the imports and exports of photographic apparatus and materials must now amount to many thousands per annum!

Having described the conditions and state of progress photography had attained at the time of my first contact with it, I think I may now enter into greater details, and relate my own personal experiences from this period right up to the end of its jubilee celebration.

I was just fourteen years old when photography was made practicable by the publication of the two processes, one by Daguerre, and the other by Fox Talbot, and when I heard or read of the wonderful discovery I was fired with a desire to obtain a sight of these "sun-pictures," but the fire was kept smouldering for some time before my desire was gratified. Nothing travelled very fast in those days. Railroads had not long been started, and were not very extensively developed. Telegraphy, by electricity, was almost unknown, and I was a fixture, having just been apprenticed to an engraving firm hundreds of miles from London. But at last I caught sight of one of those marvellous drawings made by the sun in the window of the Post Office of my native town. It was a small Daguerreotype which had been sent there along with a notice that a licence to practise the "art" could be obtained of the patentee. I forget now what amount the patentee demanded for a licence, but I know that at the time referred to it was so far beyond my means and hopes that I never entertained the idea of becoming a licensee. I believe some one in the neighbourhood bought a licence, but either could not or did not make use of it commercially.

Some time after that, a Miss Wigley, from London, came to the town to practise Daguerreotyping, but she did not remain long, and could not, I think, have made a profitable visit. If so, it could scarcely be wondered at, for the sun-pictures of that period were such thin, shimmering reflections, and distortions of the human face divine, that very few people were impressed either by the process or the newest wonder of the world. At that early period of photography, the plates were so insensitive, the sittings so long, and the conditions so terrible, it was not easy to induce anyone either to undergo the ordeal of sitting, or to pay the sum of twenty-one shillings for a very small and unsatisfactory portrait. In the infancy of the Daguerreotype process, the sitters were all placed out-of-doors, in direct sunshine, which naturally made them screw up or shut their eyes, and every feature glistened, and was painfully revealed. Many amusing stories have been told about the trials, mishaps, and disappointments attending those long and painful sittings, but the best that ever came to my knowledge was the following. In the earliest of the forties, a young lady went a considerable distance, in Yorkshire, to sit to an itinerant Daguerreotypist for her portrait, and, being limited for time, could only give one sitting. She was placed before the camera, the slide drawn, lens uncapped, and requested to sit there until the Daguerreotypist returned. He went away, probably to put his "mercury box" in order, or to have a smoke, for it was irksome—both to sitter and operator—to sit or stand doing nothing during those necessarily long exposures. When the operator returned, after an absence of fifteen or twenty minutes, the lady was sitting where he left her, and appeared glad to be relieved from her constrained position. She departed, and he proceeded with the development of the picture.

The plate was examined from time to time, in the usual way, but there was no appearance of the lady. The ground, the wall, and the chair whereon she sat, were all visible, but the image of the lady was not; and the operator was completely puzzled, if not alarmed. He left the lady sitting, and found her sitting when he returned, so he was quite unable to account for her mysterious non-appearance in the picture. The mystery was, however, explained in a few days, when the lady called for her portrait, for she admitted that she got up and walked about as soon as he left her, and only sat down again when she heard him returning. The necessity of remaining before the camera was not recognised by that sitter. I afterwards reversed that result myself by focussing the chair, drawing the slide, uncapping the lens, sitting down, and rising leisurely to cap the lens again, and obtained a good portrait without showing a ghost of the chair or anything else. The foregoing is evidence of the insensitiveness of the plates at that early period of the practice of photography; but that state of inertion did not continue long, for as soon as the accelerating properties of bromine became generally known, the time of sitting was greatly reduced, and good Daguerreotype views were obtained by simply uncapping the lens as quickly as possible. I have taken excellent views in that manner myself in England, and, when in America, I obtained instantaneous views of Niagara Falls and other places quite as rapidly and as perfect as any instantaneous views made on gelatine dry plates, one of which I have copied and enlarged to 12 by 10 inches, and may possibly reproduce the small copy in these pages.

In 1845 I came into direct contact with photography for the first time. It was in that year that an Irishman named McGhee came into the neighbourhood to practise the Daguerreotype process. He was not a licensee, but no one appeared to interfere with him, nor serve him with an injunction, for he carried on his little portrait business for a considerable time without molestation. The patentee was either very indifferent to his vested interests, or did not consider these intruders worth going to law with, for there were many raids across the borders by camera men in those early days. Several circumstances combined to facilitate the inroads of Scotch operators into the northern counties of England. Firstly, the patent laws of England did not extend to Scotland at that time, so there was a far greater number of Daguerreotypists in Edinburgh and other Scotch towns in the early days of photography than in any part of England, and many of them made frequent incursions into the forbidden land without troubling themselves about obtaining a licence, but somehow they never remained long at a time; they were either afraid of consequences, or did not meet with patronage sufficient to induce them to continue their sojourns beyond a few of the summer weeks. For many years most of the early Daguerreotypists were birds of passage, frequently on the wing. Among the earliest settlers in London, were Mr. Beard (patentee), Mr. Claudet, and Mr. J. E. Mayall—the latter is still alive, 1889—and in Edinburgh, Messrs. Ross and Thompson, Mr. Howie, Mr. Poppawitz, and Mr. Tunny—the latter was a Calotypist—with most of whom it was my good fortune to become personally acquainted in after years.

Secondly, a great deal of ill-feeling and annoyance were caused by the incomprehensible and somewhat underhanded way in which the English patent was obtained, and these feelings induced many to poach on photographic preserves, and even to defy injunctions; and, while lawsuits were pending, it was not uncommon for non-licensees to practise the new art with the impunity and feelings common to smugglers. Mr. Beard, the English patentee, brought many actions at law against infringers of his patent rights, the most memorable of which was that where Mr. Egerton, 1, Temple Street, Whitefriars, the first dealer in photographic materials, and agent for Voightlander's lenses in London, was the defendant. During that trial it came out in evidence that the patentee had earned as much as forty thousand pounds in one year by taking portraits and fees from licensees. Though the judgment of the Court was adverse to Mr. Egerton, it did not improve the patentee's moral right to his claim, for the trial only made it all the more public that the French Government had allowed M. Daguerre six thousand francs (£240), and M. Isidore Niépce four thousand francs (£160) per annum, on condition that their discoveries should be published, and *made free to all the world*. This trial did not in any way improve Mr. Beard's financial position, for eventually he became a bankrupt, and

his establishments in King William Street, London Bridge, and the Polytechnic Institute, in Regent Street, were extinguished. Mr. Beard, who was the first to practise Daguerreotyping commercially in this country, was originally a coal merchant. I think Mr. Claudet practised the process in London without becoming a licensee, either through previous knowledge, or some private arrangement made with Daguerre before the patent was granted to Mr. Beard. It was while photography was clouded with this atmosphere of dissatisfaction and litigation, that I made my first practical acquaintance with it in the following manner:—

Being anxious to obtain possession of one of those marvellous sun-pictures, and hoping to get an idea of the manner in which they were produced, I paid a visit, one sunny morning, to Mr. McGhee, the Daguerreotypist, dressed in my best, with clean shirt, and stiff stand-up collar, as worn in those days. I was a very young man then, and rather particular about the set of my shirt collar, so you may readily judge of my horror when, after making the financial arrangements to the satisfaction of Mr. McGhee, he requested me to put on a blue cotton *quasi* clean “dickey,” with a limp collar, that had evidently done similar duty many times before. You may be sure I protested, and inquired the reason why I should cover up my white shirt front with such an objectionable article. I was told if I did not put it on my shirt front would be *solarized*, and come out *blue* or dirty, whereas if I put on the blue “dickey” my shirt front would appear white and clean. What “solarized” meant, I did not know, nor was it further explained, but, as I very naturally wished to appear with a clean shirt front, I submitted to the indignity, and put on the limp and questionably clean “dickey.” While the Daguerreotypist was engaged with some mysterious manipulations in a cupboard or closet, I brushed my hair, and contemplated my singular appearance in the mirror somewhat ruefully. O, ye sitters and operators of to-day! congratulate yourselves on the changes and advantages that have been wrought in the practice of photography since then. When Mr. McGhee appeared again with something like two wooden books in his hand, he requested me to follow him into the garden; which was only a back yard. At the foot of the garden, and against a brick wall with a piece of grey cloth nailed over it, I was requested to sit down on an old chair; then he placed before me an instrument which looked like a very ugly theodolite on a tripod stand—that was my first sight of a camera—and, after putting his head under a black cloth, told me to look at a mark on the other side of the garden, without winking or moving till he said “done.” How long I sat I don’t know, but it seemed an awfully long time, and I have no doubt it was, for I know that I used to ask people to sit five and ten minutes, afterwards. The sittings over, I was requested to re-enter the house, and then I thought I would see something of the process; but no. Again Mr. McGhee went into the mysterious chamber, and shut the door quickly. In a little time he returned and told me that the sittings were satisfactory—he had taken two—and that he would finish and deliver them next day. Then I left without obtaining the ghost of an idea of the *modus operandi* of producing portraits by the sun, beyond the fact that a camera had been placed before me. Next day the portraits were delivered according to promise, but I confess I was somewhat disappointed at getting so little for my money. It was a very small picture that could not be seen in every light, and not particularly like myself, but a scowling-looking individual, with a limp collar, and rather dirty-looking face. Whatever would *mashers* have said or done, if they had gone to be photographed in those days of photographic darkness? I was, however, somewhat consoled by the thought that I, at last, possessed one of those wonderful sun-pictures, though I was ignorant of the means of production.

Soon after having my portrait taken, Mr. McGhee disappeared, and there was no one left in the neighbourhood who knew anything of the mysterious manipulations of Daguerreotyping. I had, nevertheless, resolved to possess an apparatus and obtain the necessary information, but there was no one to tell me what to buy, where to buy it, nor what to do with it. At last an old friend of mine who had been on a visit to Edinburgh, had purchased an apparatus and some materials with the view of taking Daguerreotypes himself, but finding that he could not, was willing to sell it to me, though he could not tell me how to use it, beyond showing me an image of the house opposite upon

the ground glass of the camera. I believe my friend let me have the apparatus for what it cost him, which was about £15, and it consisted of a quarter-plate portrait lens by Slater, mahogany camera, tripod stand, buff sticks, coating and mercury boxes of the roughest description, a few chemicals and silvered plates, and a rather singular but portable dark room. Of the uses of the chemicals I knew very little, and of their nature nothing which led to very serious consequences, which I shall relate in the proper place. Having obtained possession of this marvellous apparatus, my next ardent aspiration was to make a successful use of it. I distinctly remember, even at this distant date, with what nervous curiosity I examined all the articles when I unpacked them in my father's house, and with what wonder, not unmingled with apprehension, my father looked upon that display of unknown, and to him apparently nameless and useless toys. "More like a lot of conjuror's traps than anything else," he exclaimed, after I had set them all out. And a few days after he told one of my young friends that he thought I had gone out of my mind to take up with that "Daggertype" business; the name itself was a stumbling block in those days, for people called the process "dagtype, docktype, and daggertype" more frequently than by its proper name, Daguerreotype. What a contrast now-a-days, when almost every father is an amateur photographer, and encourages both his sons and daughters to become the same. My father was a very good parent, in his way, and encouraged me, to the fullest extent of his means, in the study of music and painting, and even sent me to the Government School of Design, where I studied drawing under W. B. Scott; but the new-fangled method of taking portraits did not harmonise with his conservative and practical notions. One cause of his disapprobation and dissatisfaction was, doubtless, my many failures; in fact, I may say, inability to show him any result. I had acquired an apparatus of the roughest and most primitive construction, but no knowledge of its use or the behaviour of the chemicals employed, beyond the bare numerical order in which they were to be used, and there was no one within a hundred miles of where I lived, that I knew of, who could give me lessons or the slightest hint respecting the process. I had worn out the patience of all my relations and friends in fruitless sittings. I had set fire to my singular dark room, and nearly set fire to the house, by attempting to refill the spirit lamp while alight, and I was ill and suffering from salivation through inhaling the fumes of mercury in my blind, anxious, and enthusiastic endeavours to obtain a sun-picture. It is not long since an eminent photographer told me that I was an enthusiast, but if he had seen me in those days he would, in all probability, have told me that I was mad. Though ill, I was not mad; I was only determined not to be beaten. I was resolved to keep pegging away until I obtained a satisfactory result. My friends laughed at me when I asked them to sit for a trial, and they either refused, or sat with a very bad grace, as if it really were a trial to them; but fancy, fair and kindly readers, what it must have been to me! Finding that my living models fought shy of me and my trials, I then thought of getting a lay figure, and borrowed a large doll—quite as big as a baby—of one of my lady friends. I stuck it up in a garden and pegged away at it for nearly six months. At the end of that time I was able to produce a portrait of the doll with tolerable certainty and success. Then I ventured to ask my friends to sit again, but my process was too slow for life studies, and my live sitters generally moved so much, their portraits were not recognisable. There were no head-rests in those days, at least I did not possess one, or it might have been pleasanter for my sitters and easier for myself. What surprised me very much—and I thought it a singular thing at the time—was my success in copying an engraving of Thorburn's Miniature of the Queen. I made several good and beautiful copies of that engraving, and sent one to an artist-friend, then in Devonshire, who wrote to say that it was beautiful, and that if he could get a Daguerreotype portrait with the eyes as clear as that, he would sit at once; but all the "Dagtypes" he had hitherto seen had only black holes where the eyes should be. Unfortunately, that was my own experience. I could copy from the flat well enough, but when I went to the round I went wrong. Ultimately I discovered the cause of all that, and found a remedy, but oh! the weary labour and mental worry I underwent before I mastered the difficulties of the most troublesome and uncertain, yet most beautiful and permanent of all the photographic processes that ever was discovered or invented; and now it is a lost art. No one practises it, and I don't

think that there are half-a-dozen men living—myself included—that could at this day go through all the manipulations necessary to produce a good Daguerreotype portrait or picture; yet, when the process was at the height of its popularity, a great number of people pursued it as a profession in all parts of the civilized world, and in the United States of America alone it was estimated in 1854 that there were not less than thirty thousand people making their living as Daguerreans. Few, if any, of the photographers of to-day—whether amateur or professional—know anything of the forms or uses of plates, buffs, lathes, sensitising or developing boxes, gilding stands, or other Daguerreotype appliances; and I am quite certain that there is not a dealer in all England that can furnish at this date a complete set of Daguerreotype apparatus.

It was in 1849 that I gilded my first picture—a portrait of one of my friends playing a guitar. I possess that picture now, and, after a lapse of forty years, it is as good and bright as it was on the day that it was taken. It was not a first-class production, but I hoped to do better soon, and on the strength of that hope determined to commence business as a professional Daguerreotypist. While I was considering whether I should pitch my tent permanently in my native town, or take to a nomadic kind of life, similar to what other Daguerreotypists were pursuing, I was helped to a decision by the sudden appearance of a respectable and experienced Daguerreotypist who came and built a “glass house”—the first of its kind—in my native town. This somewhat disarranged my plans, but on the whole it was rather opportune and advantageous than otherwise, for it afforded me an unexpected opportunity of gaining a great deal of practical experience on easy terms. The new comer was Mr. George Brown, who had been an “operator” for Mr. Beard, in London, and as he exhibited much finer specimens of the Daguerreotype process than any I had hitherto seen, I engaged myself to assist him for six months at a small salary. I showed him what I had done, and he showed and told me all that he knew in connection with photography, and thus commenced a business relation that ripened into a friendship that endured as long as he lived.

At the end of the six months’ engagement I left Mr. Brown, to commence business on my own account, but as neither of us considered that there was room for two Daguerreotypists in a town with a population of *one hundred and twenty thousand*, I was driven to adopt the nomadic mode of life peculiar to the itinerant photographer of the period. That was in 1850. Up to that time I had done nothing in Calotype work. Mr. Brown was strictly a Daguerreotypist, but Mr. Parry, at that time a glass dealer and amateur photographer, was working at the Calotype process, but not very successfully, for nearly all his efforts were spoiled by decomposition, which he could not then account for or overcome, but he eventually became one of the best Calotypists in the neighbourhood, and I became the possessor of some of the finest Calotype negatives he ever produced, many of which are still in my possession. Mr. Parry relinquished his glass business, and became a professional photographer soon after the introduction of the collodion process. Another amateur photographer that I met in those early days was a flute player in the orchestra of the theatre. He produced very good Calotype negatives with a single lens, and was very enthusiastic, but extremely reticent on all photographic matters. About this period I made the acquaintance of Mr. J. W. Swan: I had known him for some time previously when he was apprentice and assistant to Mr. Mawson, chemist, in Mosley Street, Newcastle-on-Tyne. Neither Mr. Mawson nor Mr. Swan were known to the photographic world at that time. Mr. Mawson was most popular as a dealer in German yeast, and I think it was not until after Archer published his process that they began to make collodion and deal in photographic materials—at any rate, I did not buy any photographic goods of them until 1852, when I first began to use Mawson’s collodion. In October, 1850, I went to Hexham, about twenty miles west of Newcastle-on-Tyne, to make my first appearance as a professional Daguerreotypist. I rented a sitting-room with a good window and clear view, so as to take “parlour portraits.” I could only take small pictures—two and a half by two inches—for which I charged half a guinea, and was favoured with a few sittings; but it was a slow place, and I left it in a few weeks.

The next move I made was to Seaham Harbour, and there I did a little better business, but the place was too small and the people too poor for me to continue long. Half guineas were not plentiful, even among the tradespeople, and there were very few gentlefolk in the neighbourhood. Some of the townspeople were very kind to me, and invited me to their homes, and although my sojourn was not very profitable, it was very pleasant. I had many pleasant rambles on the sands, and often looked at Seaham Hall and thought of Byron and his matrimonial disappointment in his marriage with Miss Milbank.

From Seaham Harbour I went to Middlesborough, hoping to do more business among a larger population, but it appeared as if I were only going from bad to worse. At that date the population was about thirty thousand, but chiefly people of the working classes, employed at Balchow and Vaughn's and kindred works. I made portraits of some of the members of Mr. Balchow's family, Mr. Geordison, and some of the resident Quakers, but altogether I did not do much more than pay expenses. I managed, however, to stay there till the year 1851, when I caught the World's Fair fever, so I packed up my apparatus and other things I did not require immediately, and sent them to my father's house, and with a few changes in my carpet-bag, and a little money in my pocket, I started off to see the Great Exhibition in London. I went by way of York and Hull, with the two-fold object of seeing some friends in both places, and to prospect on the business chances they might afford. At York I found Mr. Pumphrey was located, but as he did not appear to be fully occupied with sitters—for I found him trying to take a couple of boys fighting in a back yard—I thought there was not room for another Daguerreotypist in York. In a few days I went to Hull, but even there the ground was preoccupied, so I took the first steamer for London. We sailed on a Saturday night, and after a pleasant voyage arrived at the wharf below London Bridge early on Sunday evening. I put up at the "Yorkshire Grey," in Thames Street, where I met several people from the North, also on a visit to London to see the Great Exhibition. This being my first visit to London, I was anxious to get a sight of the streets and crowds therein, so, after obtaining some refreshment, I strolled out with one of my fellow passengers to receive my first impressions of the great metropolis. The evening was fine, and, being nearly the longest day, there was light enough to enable me to see the God-forsaken appearance of Thames Street, the dismal aspect of Fish Street Hill, and the gloomy column called "The Monument" that stands there to remind citizens and strangers of the Great Fire of 1666; but I was both amazed and amused with the life and bustle I saw on London Bridge and other places in the immediate neighbourhood, but my eyes and ears soon became fatigued with the sights and sounds of the lively and noisy thoroughfares. After a night's rest, which was frequently broken by cries of "Stop thief!" and the screams of women, I arose and made an early start for the Great Exhibition of 1851. Of all the wonderful things in that most wonderful exhibition, I was most interested in the photographic exhibits and the beautiful specimens of American Daguerreotypes, both portraits and landscapes, especially the views of Niagara Falls, which made me determine to visit America as soon as ever I could make the necessary arrangements.

While examining and admiring those very beautiful Daguerreotypes, I little thought that I was standing, as it were, between the birth of one process and the death of another; but so it was, for the newly-born collodion process very soon annihilated the Daguerreotype, although the latter process had just reached the zenith of its beauty. In the March number of the *Chemist*, Archer's Collodion Process was published, and that was like the announcement of the birth of an infant Hercules, that was destined to slay a beautiful youth whose charms had only arrived at maturity. But there was really a singular and melancholy coincidence in the birth of the Collodion Process and the early death of the Daguerreotype, for Daguerre himself died on July 10th, 1851, so that both Daguerre and his process appeared to receive their death blows in the same year. I don't suppose that Daguerre died from a shock to his system, caused by the publication of a rival process, for it is not likely that he knew anything about the invention of a process that was destined, in a very few years, to abolish his own—living as he was in the retirement of his native village, and enjoying his well-earned pension.

As Daguerre was the first of the successful discoverers of photography to be summoned by death, I will here give a brief sketch of his life and pursuits prior to his association with Nicéphore Niépce and photography. Louis Jacques Mandé Daguerre was born at Corneilles, near Paris, in 1787, of poor and somewhat careless parents, who appear to have bestowed upon him more names than attention. Though they did not endow him with a good education, they had the good sense to observe the bent of his mind and apprentice him to a theatrical scene painter. In that situation he soon made his mark, and his artistic and mechanical abilities, combined with industry, painstaking, and boldness of conception, soon raised him to the front rank of his profession, in which he gained both honour and profit. Like all true artists, he was fond of sketching from nature; and, to save time and secure true proportion, he employed such optical appliances as were then at his command. Some of his biographers say that he, like Fox Talbot, employed the camera lucida; others the camera-obscura; as there is a considerable difference between the two it would be interesting to know which it really was. At any rate it was one of these instruments which gave him the notion and created the desire to secure the views as they were presented by the lens or reflector. Much of his time was devoted to the painting and construction of a diorama which was first exhibited in 1822, and created quite a sensation in Paris. As early as 1824 he commenced his photographic experiments, with very little knowledge on the subject; but with the hope and determination of succeeding, by some means or other, in securing the pictures as Nature painted them on the screen or receiver. Doubtless he was sanguine enough then to hope to be able to obtain colours as well as drawings, but he died without seeing that accomplished, and so will many others. What he did succeed in accomplishing was marvellous, and quite entitled him to all the honour and emolument he received, but he only lived about twelve years after his discovery. He was, however, saved the mortification of seeing his beautiful discovery discarded and cast away in the hey-day of its beauty and perfection.

After a few weeks sojourn in London, seeing all the sights and revisiting all the Daguerreotype studios, I turned my back on the great city and my footsteps homewards again. As soon as I reached home I unpacked my apparatus and made arrangements for another campaign with the camera at some of the sea-side resorts, with the hope of making up for lost time and money through visiting London.

I had looked at Scarborough and found the Brothers Holroyd located there; at Whitby, Mr. Stonehouse; and I did not like the appearance of Redcar, so I settled upon Tynemouth, and did fairly well for a short season. About the end of October I went on to Carlisle, but a Scotchman had already preceded me there, and I thought one Daguerreotypist was quite enough for so small a place, and pushed on to Penrith, where I settled for the winter and gradually worked up a little connection, and formed some life-long friendships. I was the first Daguerreotypist who had visited the town of Penrith, and while there I made Daguerreotypes of Sir George and Lady Musgrave and family, and some members of the Lonsdale family. It was through the kindness of Miss Lowther that I was induced to go to Whitehaven, but I did not do much business there, so, after a bad winter, I resolved to go to America in the spring, and made arrangements for the voyage immediately. Thinking that I would find better apparatus and appliances in America, I disposed of my "Tent and Kit," closed up my affairs, bid adieu to my relatives and friends, and departed.

To obtain the benefit and experience of a long sea voyage, I secured a cabin passage in a sailing ship named the *Amazon*, and sailed from Shields towards the end of April, 1853. We crossed the Tyne bar late in the evening with a fair wind, and sailed away for the Pentland Frith so as to gain the Atlantic by sailing all round the North of Scotland. I was rather upset the first night, but recovered my appetite next morning. We entered the Pentland Frith on the Saturday afternoon, and were running through the Channel splendidly, when the carpenter came to report water in the well—I forget how many feet—but he thought it would not be safe to attempt crossing the Atlantic. I was a little alarmed at this, but the captain took it very coolly, and ordered the ship to be pumped every watch. Being the only passenger, I became a kind of chum and companion to the captain, and as we sat over our

grog that night in the cabin our conversation naturally turned upon the condition of the ship, when he remarked that he was disappointed, and that he “expected he had got a sound ship under his feet this time.” These words did not make much impression upon me then, but I had reason to comprehend their meaning afterwards. I was awoke early on the Sunday morning by the noise caused by the working of the pumps, and on going on deck found that we were becalmed, lying off the coast of Caithnesshire, and the water pouring out of the pump-hole in a continuous stream. After breakfast, and while sitting on the taffrail of the quarterdeck along with the captain, waiting for a breeze, I asked him if he intended to cross the Atlantic in such a leaky vessel. He answered “Yes, and the men are all willing.” So I thought if these men were not afraid of the ship foundering, I need not be; but I had reasons afterwards for coming to an opposite conclusion.

Towards evening the breeze sprang up briskly, and away we went, the ship heading W.N.W., as the captain said he wanted to make the northern passage. Next morning we were in a rather rough sea, and a gale of wind blowing. One of the yards was broken with the force of the wind, and the sail and broken yard dangled about the rigging for a considerable time before the sail could be hauled in and the wreckage cleared up. We had several days of bad weather, and one morning when I got up I found the ship heading East. I naturally concluded that we were returning, but the captain said that he had only turned the ship about to enable the men to stop a leak in her bows. The carpenter afterwards told me that the water came in there like a river during the night. Thus we went on through variable weather until at last we sighted two huge icebergs, and then Newfoundland, when the captain informed me that he intended now to coast up to New York. We got out of sight of land occasionally, and one day, after the captain had taken his observations and worked out the ship’s position, he called my attention to the chart, and observed that he intended to sail between an island and the mainland, but as the Channel was subject to strong and variable currents, it was a rather dangerous experiment. Being in such a leaky ship, I thought he wanted to hug the land as much as possible, which I considered a very wise and safe proceeding; but he had ulterior objects in view, which the sequel will reveal.

On the night of the 31st of May, after a long yarn from the captain about how he was once wrecked on an iceberg, I turned in with a feeling of perfect safety, for the sea was calm, the night clear, and the wind fair and free; but about daylight next morning I was awoke with a shock, a sudden tramping on deck, and the mate shouting down the companion stairs, “Captain, the ship’s ashore.” Both the captain and I rushed on deck just as we jumped out of our berths, but we could not see anything of the land or shore, for we were enveloped in a thick fog. We heard the breakers and felt the thud of the waves as they broke upon the ship, but whether we had struck on a rock or grounded on a sandy beach we could not then ascertain. The captain ordered the sails to be “slewed back” and a hawser to be thrown astern, but all efforts to get the ship off were in vain, for with every wave the ship forged more and more on to the shore.

As the morning advanced, the fog cleared away a little, which enabled us to see dimly through the mist the top of a bank of yellow sand. This sight settled the doubt as to our whereabouts, and the captain immediately gave the order “Prepare to abandon the ship.” The long boat was at once got ready, and lowered with considerable difficulty, for the ship was then more among the breakers. After a good deal of delay and danger, we all succeeded in leaving the ship and clearing the breakers. We were exposed in the open boats all that day and night, and about ten o’clock next morning we effected a landing on the lee side of the island, which we ascertained to be Sable Island, a bald crown of one of the banks of Newfoundland. Here we received help, shelter, and provisions, all provided by the Home and Colonial Governments, for the relief of shipwrecked people, for this island was one of the places where ships were both accidentally and wilfully wrecked. We were obliged to stay there sixteen days before we could get a vessel to take us to Halifax, Nova Scotia, the nearest port, and would possibly have had to remain on the island much longer, but for a mutiny among the crew. I could describe some strange and startling incidents in connection with the wreck and mutiny, but I

will not allow myself to be tempted further into the vale of divergence, as the chief object I have in view is my reminiscence of photography.

On leaving Sable Island I was taken to Halifax, where I waited the arrival of the Cunard steamer *Niagara*, to take me on to Boston; thence I proceeded by rail and steamer to New York, where I arrived about the end of June, 1853.

On landing in New York I only knew one individual, and not knowing how far I should have to go to find him I put up at an hotel on Broadway, but soon found that too expensive for my means, and went to a private boarding house as soon as I could.

Visiting all the leading Daguerreotypists on Broadway, I was somewhat astonished at their splendid reception rooms, and the vast number of large and excellent specimens exhibited. Their plain Daguerreotypes were all of fine quality, and free from the “buff lines” so noticeable in English work at that period; but all their attempts at colouring were miserable failures, and when I showed one of my coloured specimens to Mr. Gurney, he said, “Well, if you can colour one of my pictures like that I’ll believe you;” which I soon did, and very much to his astonishment. In those days I prepared my own colours, and Mr. Gurney bought a box immediately. The principal Daguerreotypists in New York at that time were Messrs. Brady, Gurney, Kent, Lawrence, Mead Brothers, and Samuel Root, and I called upon them all before I entered into any business arrangements, finally engaging myself to Messrs. Mead Brothers as a colourist and teacher of colouring for six months, and while fulfilling that engagement I gave lessons to several “Daguerreans,” and made the acquaintance of men from all parts of the Union, for I soon obtained some notoriety throughout the States in consequence of a man named Humphrey attacking me and my colouring process in a photographic journal which bore his name, as well as in the *New York Tribune*. I replied to his attack in the columns of the *Tribune*, but I saw that he had a friend on the staff, and I did not feel inclined to continue the controversy. Mr. Humphrey knew nothing about my process, but began and continued the discussion on his knowledge of what was known as the “Isinglass Process,” which was not mine. After completing my engagements with Messrs. Mead Brothers, I made arrangements to supply the stock dealers with my prepared colours, and travel the States myself to introduce them to all the Daguerreans residing in the towns and cities I should visit.

In the principal cities I found all the Daguerreans quite equal to the best in New York, and all doing good business, and I gave lessons in colouring to most of them. In Newark I met Messrs. Benjamin and Polson; in Philadelphia, Marcus Root and Dr. Bushnell. I encountered a great many *doctors* and *professors* in the business in America. In Baltimore, Maryland—then a slave State—many of the Daguerreans owned slaves. In Washington D.C., I renewed my acquaintance with Mr. George Adams, one of the best Daguerreans in the City; and while visiting him a very curious thing occurred. One of the representatives of the South came in to have his portrait taken, and the first thing he did was to lay a revolver and a bowie knife on the table beside him. He had just come from the House of Representatives. His excuse for such a proceeding was that he had bought some slaves at the market at Alexandria, and was going to take them home that night. He was a very tall man, and when he stood up against the background his head was above it. As he wanted to be taken standing, this put Mr. Adams into a dilemma, and he asked what he should do. I thought the only thing that could be done was to move the background up and down during exposure, which we did, and so obviated the appearance of a line crossing the head.

While staying in Washington I attended one of the levées at the White House, and was introduced to President Pearce. There was no fuss or difficulty in gaining admission. I had only to present my card at the door, and the City Marshall at once led me into the room where the President, surrounded by some of his Cabinet, was waiting to receive, and I was introduced. After a cordial shake of his hand, I passed on to another saloon where there was music and promenading in mixed costumes, for most of the men were dressed as they liked, and some of the ladies wore bonnets. It was the weekly *sans cérémonie* reception. Finding many of the people of Washington very agreeable

and hospitable, I stayed there a considerable time. When I started on the southern journey I did intend to go on to New Orleans, but I stayed so long in Philadelphia and Washington the summer was too far advanced, and as a rather severe outbreak of yellow fever had occurred, I returned to New York and took a journey northward, visiting Niagara Falls, and going on to Canada. I sailed up the Hudson River, stopping at Albany and Troy. At the latter place I met an Englishman, named Irvine, a Daguerrean who treated me hospitably, and for whom I coloured several Daguerreotypes. He wanted me to stay with him, but that I declined. Thence I proceeded to Rochester, and there found that one of my New York pupils had been before me, representing himself as Werge the colourist, for when I introduced myself to the principal Daguerrean he told me that Werge—a very different man—had been there two or three weeks ago. I discovered who the fellow was, and that he had practised a piece of Yankee smartness for which I had no redress. From Rochester I proceeded to Buffalo, where I met with another instance of Yankee smartness of a different kind. I had sold some colours to a man there who paid me in dollar bills, the usual currency of the country, but when I tendered one of these bills for payment at the hotel, it was refused. I next offered it on board a steamboat, but there it was also declined. When I had an opportunity I returned it to the man who gave it to me, and requested him to send me a good one instead. He was honest enough to do that, and impudent enough to tell me that he knew it was bad when he gave it to me, but as I was a stranger he thought I might pass it off easily.

I next went to Niagara Falls, where it was my good fortune to encounter two very different specimens of American character in the persons of Mr. Easterly and Mr. Babbitt, the former a visitor and the latter a resident Daguerrean, who held a monopoly from General Porter to Daguerreotype the Falls and visitors. He had a pavilion on the American side of the Falls, under which his camera was in position all day long, and when a group of visitors stood on the shore to survey the Falls from that point, he took the group—without their knowledge—and showed it to the visitors before they left. In almost every instance he sold the picture at a good price; the people were generally delighted to be taken at the Falls. I need hardly say that they were all taken instantaneously, and embraced a good general view, including the American Fall, Goat Island, the Horse Shoe Fall, and the Canadian shore. Many of these views I coloured for Mr. Babbitt, but there was always a beautiful green colour on the brink of the Horse Shoe Fall which I never could match. For many years I possessed one of Mr. Babbitt's Daguerreotype views, as well as others taken by Mr. Easterly and myself, but I had the misfortune to be deprived of them all by fire. Some years after I lent them to an exhibition in Glasgow, which was burnt down, and all the exhibits destroyed. After a delightful sojourn of three weeks at Niagara Falls, I took steamer on the lower Niagara River, sailed down to Lake Ontario, and down the River St. Lawrence, shooting the Lachine Rapids, and on to Montreal.

In the Canadian City I did not find business very lively, so after viewing the fine Cathedral of Notre Dame, the mountain, and other places, I left Montreal and proceeded by rail to Boston. The difference between the two cities was immense. Montreal was dull and sleepy, Boston was all bustle and life, and the people were as unlike as the cities. On my arrival in Boston, I put up at the Quincy Adams Hotel, and spent the first few days in looking about the somewhat quaint and interesting old city, hunting up Franklin Associations, and revolutionary landmarks, Bunker Hill, and other places of interest. Having satisfied my appetite for these things, I began to look about me with an eye to business, and called upon the chief Daguerreans and photographers in Boston. Messrs. Southworth and Hawes possessed the largest Daguerreotype establishment, and did an excellent business. In their "Saloon" I saw the largest and finest revolving stereoscope that was ever exhibited. The pictures were all whole-plate Daguerreotypes, and set vertically on the perpendicular drum on which they revolved. The drum was turned by a handle attached to cog wheels, so that a person sitting before it could see the stereoscopic pictures with the utmost ease. It was an expensive instrument, but it was a splendid advertisement, for it drew crowds to their saloon to see it and to sit, and their enterprise met with its reward.

At Mr. Whipple's gallery, in Washington Street, a dual photography was carried on, for he made both Daguerreotypes and what he called "crystalotypes," which were simply plain silver prints obtained from collodion negatives. Mr. Whipple was the first American photographer who saw the great commercial advantages of the collodion process over the Daguerreotype, and he grafted it on the elder branch of photography almost as soon as it was introduced. Indeed, Mr. Whipple's establishment may be considered the very cradle of American photography as far as collodion negatives and silver prints are concerned, for he was the very first to take hold of it with spirit, and as early as 1853 he was doing a large business in photographs, and teaching the art to others. Although I had taken collodion negatives in England with Mawson's collodion in 1852, I paid Mr. Whipple fifty dollars to be shown how he made his collodion, silver bath, developer, printing, &c., &c., for which purpose he handed me over to his active and intelligent assistant and newly-made partner, Mr. Black. This gave me the run of the establishment, and I was somewhat surprised to find how vast and varied were his mechanical appliances for reducing labour and expediting work. The successful practice of the Daguerreotype art greatly depended on the cleanness and highly polished surface of the silvered plates, and to secure these necessary conditions, Mr. Whipple had, with characteristic and Yankee-like ingenuity, obtained the assistance of a steam engine which not only "drove" all the circular cleaning and buffing wheels, but an immense circular fan which kept the studio and sitters delightfully cool. Machinery and ingenuity did a great many things in Mr. Whipple's establishment in the early days of photography. Long before the Ambrotype days, pictures were taken on glass and thrown upon canvas by means of the oxyhydrogen light for the use of artists. At that early period of the history of photography, Messrs. Whipple and Black did an immense "printing and publishing" trade, and their facilities were "something considerable." Their toning, fixing, and washing baths were almost worthy the name of vats.

Messrs. Masury and Silsby were also early producers of photographs in Boston, and in 1854 employed a very clever operator, Mr. Turner, who obtained beautiful and brilliant negatives by iron development. On the whole, I think Boston was ahead of New York for enterprise and the use of mechanical appliances in connection with photography. I sold my colours to most of the Daguerreotypists, and entered into business relations with two of the dealers, Messrs. French and Cramer, to stock them, and then started for New York to make arrangements for my return to England.

When I returned to New York the season was over, and everyone was supposed to be away at Saratoga Springs, Niagara Falls, Rockaway, and other fashionable resorts; but I found the Daguerreotype galleries all open and doing a considerable stroke of business among the cotton planters and slave holders, who had left the sultry south for the cooler atmosphere of the more northern States. The Daguerreotype process was then in the zenith of its perfection and popularity, and largely patronised by gentlemen from the south, especially for large or double whole-plates, about 16 by 12 inches, for which they paid fifty dollars each. It was only the best houses that made a feature of these large pictures, for it was not many of the Daguerreans that possessed a "mammoth tube and box"—*i.e.*, lens and camera—or the necessary machinery to "get up" such large surfaces, but all employed the best mechanical means for cleaning and polishing their plates, and it was this that enabled the Americans to produce more brilliant pictures than we did. Many people used to say it was the climate, but it was nothing of the kind. The superiority of the American Daguerreotype was entirely due to mechanical appliances. Having completed my business arrangements and left my colours on sale with the principal stock dealers, including the Scovill Manufacturing Company, Messrs. Anthony, and Levi Chapman.

I sailed from New York in October 1854, and arrived in England in due time without any mishap, and visiting London again as soon as I could, I called at Mr. Mayall's gallery in Regent Street to see Dr. Bushnell, whom I knew in Philadelphia, and who was then operating for Mr. Mayall. While there Mr. Mayall came in from the Guildhall, and announced the result of the famous trial, "Talbot

versus Laroche,” a verbatim report of which is given in the Journal of the Photographic Society for December 21st, 1854. Mr. Mayall was quite jubilant, and well he might be, for the verdict for the defendant removed the trammels which Mr. Fox Talbot attempted to impose upon the practice of the collodion process, which was Frederick Scott Archer’s gift to photographers. That was the first time that I had met Mr. Mayall, though I had heard of him and followed him both at Philadelphia and New York, and even at Niagara Falls. At that time Mr. Mayall was relinquishing the Daguerreotype process, though one of the earliest practitioners, for he was in business as a Daguerreotypist in Philadelphia from 1842 to 1846, and I know that he made a Daguerreotype portrait of James Anderson, the tragedian, in Philadelphia, on Sunday, May 18th, 1845. During part of the time that he was in Philadelphia he was in partnership with Marcus Root, and the name of the firm was “Highschool and Root,” and about the end of 1846 Mr. Mayall opened a Daguerreotype studio in the Adelaide Gallery, King William Street, Strand, London, under the name of Professor Highschool, and soon after that he opened a Daguerreotype gallery in his own name in the Strand, which establishment he sold to Mr. Jabez Hughes in 1855. The best Daguerreotypists in London in 1854 were Mr. Beard, King William Street, London Bridge; Messrs. Kilburn, T. R. Williams and Claudet, in Regent Street; and W. H. Kent, in Oxford Street. The latter had just returned from America, and brought all the latest improvements with him. Messrs. Henneman and Malone were in Regent Street doing calotype portraits. Henneman had been a servant to Fox Talbot, and worked his process under favourable conditions. Mr. Lock was also in Regent Street, doing coloured photographs. He offered me a situation at once, if I could colour photographs as well as I could colour Daguerreotypes, but I could not, for the processes were totally different. M. Manson, an old Frenchman, was the chief Daguerreotype colourist in London, and worked for all the principal Daguerreotypists. I met the old gentleman first in 1851, and knew him for many years afterwards. He also made colours for sale. Not meeting with anything to suit me in London, I returned to the North, calling at Birmingham on my way, where I met Mr. Whitlock, the chief Daguerreotypist there, and a Mr. Monson, who professed to make Daguerreotypes and all other types. Paying a visit to Mr. Elisha Mander, the well-known photographic case maker, I learnt that Mr. Jabez Hughes, then in business in Glasgow, was in want of an assistant, a colourist especially. Having met Mr. Hughes in Glasgow in 1852, and knowing what kind of man he was, I wrote to him, and was engaged in a few days. I went to Glasgow in January, 1855, and then commenced business relations and friendship with Mr. Hughes that lasted unbroken until his death in 1884. My chief occupation was to colour the Daguerreotypes taken by Mr. Hughes, and occasionally take sitters, when Mr. Hughes was busy, in another studio. I had not, however, been long in Glasgow, when Mr. Hughes determined to return to London. At first he wished me to accompany him, but it was ultimately arranged that I should purchase the business, and remain in Glasgow, which I did, and took possession in June, Mr. Hughes going to Mr. Mayall’s old place in the Strand, London. Mr. Hughes had been in Glasgow for nearly seven years, and had done a very good business, going first as operator to Mr. Bernard, and succeeding to the business just as I was doing. While Mr. Hughes was in Glasgow he was very popular, not only as a Daguerreotypist, but as a lecturer. He delivered a lecture on photography at the Literary and Philosophical Society, became an active member of the Glasgow Photographic Society, and an enthusiastic member of the St. Mark’s Lodge of Freemasons. Only a day or two before he left Glasgow, he occupied the chair at a meeting of photographers, comprising Daguerreotypists and collodion workers, to consider what means could be adopted to check the downward tendency of prices even in those early days. I was present, and remember seeing a lady Daguerreotypist among the company, and she expressed her opinion quite decidedly. Efforts were made to enter into a compact to maintain good prices, but nothing came of it. Like all such bandings together, the band was quickly and easily broken.

I had the good fortune to retain the best of Mr. Hughes’s customers, and make new ones of my own, as well as many staunch and valuable friends, both among what I may term laymen and brother Masons, while I resided in Glasgow. Most of my sitters were of the professional classes, and the *elite*

of the city, among whom were Sir Archibald Alison, the historian, Col. (now General) Sir Archibald Alison, Dr. Arnott, Professor Ramsey, and many of the princely merchants and manufacturers. Some of my other patrons—for I did all kinds of photographic work—were the late Norman Macbeth, Daniel McNee (afterwards Sir Daniel), and President of the Scottish Academy of Art, and also Her Majesty the Queen, for she bought two of my photographs of Glasgow Cathedral, and a copy of my illustration of Hood's "Song of the Shirt," copies of which I possess now, and doubtless so does Her Majesty. One of the most interesting portraits I remember taking while I was in Glasgow was that of John Robertson, who constructed the first marine steam engine. He was associated with Henry Bell, and fitted the "Comet" with her engine. Mr. Napier senr., the celebrated engineer on the Clyde, brought Robertson to sit to me, and ordered a great many copies. I also took a portrait of Harry Clasper, of rowing and boat-building notoriety, which was engraved and published in the *Illustrated London News*. Several of my portraits were engraved both on wood and steel, and published. At the photographic exhibition in connection with the meeting of the British Association held in Glasgow, in 1855, I saw the largest collodion positive on glass that ever was made to my knowledge. The picture was thirty-six inches long, a view of Gourock, or some such place down the Clyde, taken by Mr. Kibble. The glass was British plate, and cost about £1. I thought it a great evidence of British pluck to attempt such a size. When I saw Mr. Kibble I told him so, and expressed an opinion that I thought it a waste of time, labour, and money not to have made a negative when he was at such work. He took the hint, and at the next photographic exhibition he showed a silver print the same size. Mr. Kibble was an undoubted enthusiast, and kept a donkey to drag his huge camera from place to place. My pictures frequently appeared at the Glasgow exhibition, but at one, which was burnt down, I lost all my Daguerreotype views of Niagara Falls, Whipple's views of the moon, and many other valuable pictures, portraits, and views, which could never be replaced.

THIRD PERIOD. COLLODION



FREDERICK SCOTT ARCHER.

From Glass Positive by R. Cade, Ipswich. 1855.



HEVER CASTLE, KENT.

Copy of Glass Positive taken by F. Scott Archer in 1849.

THIRD PERIOD

COLLODION TRIUMPHANT

In 1857 I abandoned the Daguerreotype process entirely, and took to collodion solely; and, strangely enough, that was the year that Frederick Scott Archer, the inventor, died. Like Daguerre, he did not long survive the publication and popularity of his invention, nor did he live long enough to see his process superseded by another. In years, honours, and emoluments, he fell far short of Daguerre, but his process had a much longer existence, was of far more commercial value, benefitting private individuals and public bodies, and creating an industry that expanded rapidly, and gave employment to thousands all over the world; yet he profited little by his invention, and when he died, a widow and three children were left destitute. Fortunately a few influential friends bestirred themselves in their interest, and when the appeal was made to photographers and the public to the Archer Testimonial, the following is what appeared in the pages of *Punch*, June 13th, 1857:—

“To the Sons of the Sun

“The inventor of collodion has died, leaving his invention unpatented, to enrich thousands, and his family unportioned to the battle of life. Now, one expects a photographer to be almost as sensitive as the collodion to which Mr. Scott Archer helped him. A deposit of silver is wanted (gold will do), and certain faces, now in the dark chamber, will light up wonderfully, with an effect never before equalled by photography. A respectable ancient writes that the statue of Fortitude was the only one admitted to the Temple of the Sun. Instead whereof, do you, photographers, set up Gratitude in your little glass temples of the sun, and sacrifice, according to your means, in memory of the benefactor who gave you the deity for a household god. Now, answers must not be negatives.”

The result of that appeal, and the labours of the gentlemen who so generously interested themselves on behalf of the widow and orphans, was highly creditable to photographers, the Photographic Society, Her Majesty’s Ministers, and Her Majesty the Queen. What those labours were, few now can have any conception; but I think the very best way to convey an idea of those labours and their successful results will be to reprint a copy of the final report of the committee.

The Report of the Committee of the Archer Testimonial

“The Committee of the Archer Testimonial, considering it necessary to furnish a statement of the course pursued towards the attainment of their object, desire to lay before the subscribers and the public generally a full report of their proceedings.

“Shortly after the death of Mr. F. Scott Archer, a preliminary meeting of a few friends was held, and it was determined that a printed address should be issued to the photographic world.

“Sir William Newton, cordially co-operating in the movement, at once made application to Her Most Gracious Majesty. The Queen, with her usual promptitude and kindness of heart, forwarded a donation of £20 towards the Testimonial. The Photographic Society of London, at the same time, proposed a grant of £50, and this liberality on the part of the Society was followed by an announcement of a list of donations from individual members, which induced your Committee to believe that if an appeal were made to the public, and those practising the photographic art, a sum

might be raised sufficiently large, not only to relieve the immediate wants of the widow and children, but to purchase a small annuity, and thus in a slight degree compensate for the heavy loss they had sustained by the premature death of one to whom the photographic art had already become deeply indebted.

“To aid in the accomplishment of this design, Mr. Mayall placed the use of his rooms at the service of a committee then about to be formed. Sir William Newton and Mr. Roger Fenton consented to act as treasurers to the fund, and the Union, and London and Westminster Banks kindly undertook to receive subscriptions.

“Your Committee first met on the 8th day of June, 1857, Mr. Digby Wyatt being called to the chair, when it was resolved to ask the consent of Professors Delamotte and Goodeve to become joint secretaries. These duties were willingly accepted, and subscription lists opened in various localities in furtherance of the Testimonial.

“Your Committee met on the 8th day of July, and again on the 4th day of September, when, on each occasion, receipts were announced and paid into the bankers.

“The Society of Arts having kindly offered, through their Secretary, the use of apartments in the house of the Society for any further meetings, your Committee deemed it expedient to accept the same, and passed a vote of thanks to Mr. Mayall for the accommodation previously afforded by that gentleman.

“Your Committee, believing that the interests of the fund would be better served by a short delay in their proceedings, resolved on deferring their next meeting until the month of November, or until the Photographic Society should resume its meetings, when a full attendance of members might be anticipated; it being apparent that individually and collectively persons in the provinces had withheld their subscriptions until the grant of the Photographic Society of London had been formally sanctioned at a special meeting convened for the purpose, and that their object—the purchase of an annuity for Mrs. Archer and her children—could only be effected by the most active co-operation among all classes.

“Your Committee again met on the 26th of November, when it was resolved to report progress to the general body of subscribers, and that a public meeting be called for the purpose, at which the Lord Chief Baron Pollock should be requested to preside. To this request the Lord Chief Baron most kindly and promptly acceded; and your Committee determined to seek the co-operation of their photographic friends and the public to enable them to carry out in its fullest integrity the immediate object of securing some small acknowledgment for the eminent services rendered to photography by the late Mr. Archer.

“At this meeting it was stated that an impression existed, which to some extent still exists, that Mr. Archer was not the originator of the Collodion Process; your Committee, therefore, think it their duty to state emphatically that they are fully satisfied of the great importance of the services rendered by him, as an original inventor, to the art of photography.

“Professor Hunt, having studied during twenty years the beautiful art of photography in all its details, submitted to the Committee the following explanation of Mr. Archer’s just right:—

“As there appears to be some misconception of the real claim of Mr. Archer to be considered as a *discoverer*, it is thought desirable to state briefly and distinctly what we owe to him. There can be no doubt that much of the uncertainty which has been thought by some persons to surround the introduction of collodion, has arisen from the unobtrusive character of Mr. Archer himself, who deferred for a considerable period *the publication of the process of which he was the discoverer*.

“When Professor Schönbein, of Basle, introduced gun-cotton at the meeting of the British Association at Southampton in 1846, the solubility of this curious substance in ether was alluded to. Within a short time collodion was employed in our hospitals for the purposes of covering with a film impervious to air abraded surfaces on the body; its peculiar electrical condition was also known and exhibited by Mr. Hall, of Dartford, and others.

“The beautiful character of the collodion film speedily led to the idea of using it as a medium for receiving photographic agents, and experiments were made by spreading the collodion on paper and on glass, to form with it sensitive tablets. These experiments were all failures, owing to the circumstance that the collodion was regarded merely as a sheet upon which the photographic materials were to be spread; the dry collodion film being in all cases employed.

“To Mr. Archer, who spent freely both time and money in experimental research, it first occurred to dissolve in the collodion itself the iodide of potassium. By this means he removed every difficulty, and became the inventor of the collodion process. The pictures thus obtained were exhibited, and some of the details of the process communicated by Mr. Scott Archer in confidence to friends before he published his process. This led, very unfortunately, to experiments by others in the same direction, and hence there have arisen claims in opposition to those of this lamented photographer. Everyone, however, acquainted with the early history of the collodion process freely admits that Mr. Archer was the *sole inventor of iodized collodion*, and of those manipulatory details which still, with very slight modifications, constitute the collodion process, and he was the first person who published any account of the application of this remarkable accelerating agent, by which the most important movement has been given to the art of photography.’

“Your committee, in May last, heard with deep regret of the sudden death of the widow, Mrs. Archer, which melancholy event caused a postponement of the general meeting resolved upon in November last. Sir Wm. Newton thereupon resolved to make another effort to obtain a pension for the three orphan children, now more destitute than ever, and so earnestly did he urge their claim upon the Minister, Lord Derby, that a reply came the same day from his lordship’s private secretary, saying, ‘The Queen has been pleased to approve of a pension of fifty pounds per annum being paid from the Civil List to the children of the late Mr. Frederick Scott Archer, in consideration of the scientific discoveries of their father,’ his lordship adding his regrets ‘that the means at his disposal have not enabled him to do more in this case.’ Your committee, to mark their sense of the value of the services rendered to the cause by Sir William Newton, thereupon passed a vote of thanks to him. In conclusion, your committee have to state that a trust deed has been prepared, free of charge, by Henry White, Esq., of 7, Southampton Street, which conveys the fund collected to trustees, to be by them invested in the public securities for the sole benefit of the orphan children. The sum in the Union Bank now amounts to £549 11s. 4d., exclusive of interest, and the various sums—in all about £68—paid over to Mrs. Archer last year. Thus far, the result is a subject for congratulation to the subscribers and your committee, whose labours have hitherto not been in vain. Your committee are, nevertheless, of opinion that an appeal to Parliament might be productive of a larger recognition of the claim of these orphan children—a claim not undeserving the recognition of the Legislature, when the inestimable boon bestowed upon the country is duly considered. Since March 1851, when Mr. Archer described his process in the pages of the *Chemist*, how many thousands must in some way or other have been made acquainted with the immense advantages it offers over all other processes in the arts, and how many instances could be adduced in testimony of its usefulness? For instance, its value to the Government during the last war, in the engineering department, the construction of field works, and in recording observations of historical and scientific interest. Your committee noticed that an attractive feature of the Photographic Society’s last exhibition was a series of drawings and plans, executed by the Royal Engineers, in reduction of various ordnance maps, at a saving estimated at £30,000 to the country. The non-commissioned officers of this corps are now trained in this art, and sent to different foreign stations, so that in a few years there will be a network of photographic stations spread over the world, and having their results recorded in the War Department, and, in a short time, all the world will be brought under the subjugation of art.

“Mr. Warren De la Rue exhibited to the Astronomical Society, November, 1857, photographs of the moon and Jupiter, taken by the collodion process in five seconds, of which the Astronomer-Royal said, ‘that a step of very great importance had been made, and that, either as regards the

self-delineation of clusters of stars, nebulae, and planets, or the self-registration of observations, it is impossible at present to estimate the value.' When admiring the magnificent photographic prints which are now to be seen in almost every part of the civilized world, an involuntary sense of gratitude towards the discoverer of the collodion process must be experienced, and it cannot but be felt how much the world is indebted to Mr. Archer for having placed at its command the means by which such beautiful objects are presented. How many thousands amongst those who owe their means of subsistence to this process must have experienced such a feeling of gratitude? It is upon such considerations that the public have been, and still are, invited to assist in securing for the orphan children of the late Mr. Archer some fitting appreciation of the service which he rendered to science, art, his country—nay, to the whole world.

*"M. Digby Wyatt, Chairman,
"Jabez Hogg, Secretary to Committee.*

"Society of Arts, July, 1858."

After reading that report, and especially Mr. Hunt's remarks, it will appear evident to all that even that act of charity, gratitude, and justice could not be carried through without someone raising objections and questioning the claims of Frederick Scott Archer as the original inventor of the Collodion process. Nearly all the biographers and historians of photography have coupled other names with Archer's, either as assistants or co-inventors, but I have evidence in my possession that will prove that neither Fry nor Diamond afforded Archer any assistance whatever, and that Archer preceded all the other claimants in his application of collodion. In support of the first part of this statement, I shall give extracts from Mrs. Archer's letter, now in my possession, which, I think, will set that matter at rest for ever. Mrs. Archer, writing from Bishop Stortford on December 7th, 1857, says, "When Mr. A. prepared pupils for India he always taught the paper process as well as the Collodion, for fear the chemicals should cause disappointment in a hot climate, as I believe that the negative paper he prepared differed from that in general use. I enclosed a specimen made in our glass house.

"In Mr. Hunt's book, as well as Mr. Horne's, Mr. Fry's name is joined with Mr. Archer's as the originators of the Collodion process.

"Should Mr. Hunt seem to require any corroboration of what I have stated respecting Mr. Fry, I can send you many of Mr. Fry's notes of invitation, when Mr. A. merely gave him lessons in the application of collodion, and Mr. Brown gave me the correspondence which passed between him and Mr. Fry on the subject at the time Mr. Home's book was published. I did not send up those papers, for, unless required, it is useless to dwell on old grievances, but I should like such a man as Mr. Hunt to understand *how* the association of the two names originated."

As to priority of application, the following letter ought to settle that point:—

*"Alma Cottage, Bishop Stortford.
"9th December, 1857.*

"Sir,—My hunting has at length proved successful. In the enclosed book you will find notes respecting the paper pulp, albumen, tanno-gelatine, and collodion. You will therein see Mr. Archer's notes of iod-collodion in 1849. You may wonder that I could not find this note-book before, but the numbers of papers that there are, and the extreme disorder, defy description. My head was in such a deplorable state before I left that I could arrange nothing. Those around me were most anxious to destroy *all the papers*, and I had great trouble to keep all with Mr. Archer's handwriting upon them, however dirty and rubbishing they might appear, so they were huddled together, a complete chaos. I look back with the greatest thankfulness that my brain did not completely lose its balance, for I had not a single relative who entered into Mr. Archer's pursuits, so that they could not possibly assist me.

"Mr. Archer being of so reserved a character, I had to *find out* where everything was, and my search has been amongst different things. I need not tell you that I hope this dirty enclosure will be taken care of.

“The paper pulp occupied much time; in fact, notes were only made of articles which had been much tried, which might probably be brought into use.—I am, sir, yours faithfully,

“*J. Hogg, Esq.*
F. G. Archer.”

If the foregoing is not evidence sufficient, I have by me a very good *glass positive* of Hever Castle, Kent, which was taken in the spring of 1849, and two collodion negatives made by Mr. Archer in the autumn of 1848; and these dates are all vouched for by Mr. Jabez Hogg, who was Mr. Archer’s medical attendant and friend, and knew him long before he began his experiments with collodion—whereas I cannot find a trace even of the *suggestion* of the application of collodion in the practice of photography either by Gustave Le Gray or J. R. Bingham prior to 1849; while Mr. Archer’s note-book proves that he was not only iodizing collodion at that date, but making experiments with paper pulp and *gelatine*; so that Mr. Archer was not only the inventor of the collodion process, but was on the track of its destroyer even at that early date. He also published his method of bleaching positives and intensifying negatives with bichloride of mercury.

Frederick Scott Archer was born at Bishop Stortford in 1813, but there is little known of his early life, and what little there is I will allow Mrs. Archer to tell in her own way.

“Dear Sir,—I do not know whether the enclosed is what you require; if not, be kind enough to let me know, and I must try to supply you with something better. I thought you merely required particulars relating to photography. Otherwise Mr. Archer’s career was a singular one: Losing his parents in childhood, he lived in a world of his own; I think you know he was apprenticed to a bullion dealer in the city, where the most beautiful antique gems and coins of all nations being constantly before him, gave him the desire to model the figures, and led him to the study of numismatics. He worked so hard at nights at these pursuits that his master gave up the last two years of his time to save his life. He only requested him to be on the premises, on account of his extreme confidence in him.

“Many other peculiarities I could mention, but I dare say you know them already.

“I will send a small case to you, containing some early specimens and gutta-percha negatives, with a copy of Mr. A.’s portrait, which I found on leaving Great Russell Street, and have had several printed from it. It is not a good photograph, but I think you will consider it a likeness. I am, yours faithfully,

“*J. Hogg, Esq.*
F. G. Archer.”

Frederick Scott Archer pursued the double occupation of sculptor and photographer at 105, Great Russell Street. It was there he so persistently persevered in his photographic experiments, and there he died in May, 1857, and was interred in Kensal Green Cemetery. A reference to the report of the Committee will show what was done for his bereaved family—a widow and three children. Mrs. Archer followed her husband in March, 1858, and two of the children died early; but one, Alice (unmarried), is still alive and in receipt of the Crown pension of fifty pounds per annum.

While the collodion episode in the history of photography is before my readers, and especially as the process is rapidly becoming extinct, I think this will be a suitable place to insert Archer’s instructions for making a *soluble* gun-cotton, iodizing collodion, developing, and fixing the photographic image.

<i>Gun-Cotton (or Pyroxaline, as it was afterwards named).</i>		
Take of dry nitre in powder	40	parts
Sulphuric acid	60	„
Cotton	2	„

The sulphuric acid and the nitre were mixed together, and immediately the latter was all dissolved, the gun-cotton was added and well stirred with a glass rod for about two minutes; then the cotton was plunged into a large bowl of water and well washed with repeated changes of water until the acid and nitre were washed away. The cotton was then pressed and dried, and converted into collodion by dissolving 30 grains of gun-cotton in 18 fluid ounces of ether and 2 ounces of alcohol—putting the cotton into the ether first, and then adding the alcohol; the collodion allowed to settle and decanted prior to iodizing. The latter operation was performed by adding a sufficient quantity of iodide of silver to each ounce of the plain collodion. Mr. Archer tells how to make the iodide of silver, but the quantity is regulated by the quantity of alcohol in the collodion. When the iodized collodion was ready for use, a glass plate was cleaned and coated with it, and then sensitised by immersion in a bath of nitrate of silver solution—30 grains of nitrate of silver to each ounce of distilled water. From three to five minutes' immersion in the silver bath was generally sufficient to sensitise the plate. This, of course, had to be done in what is commonly called a *dark room*. After exposure in the camera, the picture was developed by pouring over the surface of the plate a solution of pyrogallic acid of the following proportions:—

Pyrogallic acid	5	grains
Distilled water	10	ounces
Glacial acetic acid	40	minims

After the development of the picture it was washed and fixed in a solution of hyposulphite of soda, 4 ounces to 1 pint of water. The plate was then washed and dried. This is an epitome of the whole of Archer's process for making either negatives or positives on glass, the difference being effected by varying the time of exposure and development. Of course the process was somewhat modified and simplified by experience and commercial enterprise. Later on bromides were added to the collodion, an iron developer employed, and cyanide of potassium as a fixing agent; but the principle remained the same from first to last.

When pyrogallic acid was first employed in photography, it was quoted at 21s. per oz., and, if I remember rightly, I paid 3s. for the first *drachm* that I purchased. On referring to an old price list I find Daguerreotype plates, 2½ by 2 inches, quoted at 12s. per dozen; nitrate of silver, 5s. 6d. per oz.; chloride of gold, 5s. 6d. for 15 grains; hyposulphite of soda at 5s. per lb.; and a half-plate rapid portrait lens by Voightlander, of Vienna, at £60. Those were the days when photography might well be considered expensive, and none but the wealthy could indulge in its pleasures and fascinations.

While I lived in Glasgow, competition was tolerably keen, even then, and amongst the best "glass positive men" were Messrs. Bibo, Bowman, J. Urie, and Young and Sun, as the latter styled himself; and in photographic portraiture, plain and coloured, by the collodion process, were Messrs. Macnab and J. Stuart. From the time that I relinquished the Daguerreotype process, in 1857, I devoted my attention to the production of high-class collodion negatives. I never took kindly to *glass positives*, though I had done some as early as 1852. They were never equal in beauty and delicacy to a good Daguerreotype, and their low tone was to me very objectionable. I considered the Ferrotypes the best form of collodion positive, and did several of them, but my chief work was plain and coloured prints from collodion negatives, also small portraits on visiting cards.

Early in January, 1860, my home and business were destroyed by fire, and I lost all my old and new specimens of Daguerreotypes and photographs, all my Daguerreotype and other apparatus, and nearly everything I possessed. As I was only partially insured, I suffered considerable loss. After settling my affairs I decided on going to America again and trying my luck in New York. Family ties influenced this decision considerably, or I should not have left Glasgow, where I was both prosperous

and respected. To obtain an idea of the latest and best aspects of photography, I visited London and Paris.

The carte-de-visite form of photography had not exhibited much vitality at that period in London, but in Paris it was beginning to be popular. While in London I accompanied Mr. Jabez Hughes to the meeting of the Photographic Society, Feb. 7th, 1860, the Right Honorable the Lord Chief Baron Pollock in the chair, when the report of the Collodion Committee was delivered. The committee, consisting of F. Bedford, P. Delamotte, Dr. Diamond, Roger Fenton, Jabez Hughes, T. A. Malone, J. H. Morgan, H. P. Robinson, Alfred Rosling, W. Russell Sedgefield, J. Spencer, and T. R. Williams, strongly recommended Mr. Hardwich's formula. That was my first visit to the Society, and I certainly did not think then that I should ever see it again, or become and be a member for twenty-two years.

I sailed from Liverpool in the ss. *City of Baltimore* in March, and reached New York safely in April, 1860. I took time to look about me, and visited all the "galleries" on Broadway, and other places, before deciding where I should locate myself. Many changes had taken place during the six years I had been absent. Nearly all the old Daguerreotypists were still in existence, but all of them, with the exception of Mr. Brady, had abandoned the Daguerreotype process, and Mr. Brady only retained it for small work. Most of the chief galleries had been moved higher up Broadway, and a mania of magnificence had taken possession of most of the photographers. Mr. Anson was the first to make a move in that direction by opening a "superb gallery" on the ground floor in Broadway right opposite the Metropolitan Hotel, filling his windows with life-sized photographs coloured in oil at the back, which he called Diaphanotypes. He did a large business in that class of work, especially among visitors from the Southern States; but that was soon to end, for already there were rumours of war, but few then gave it any serious consideration.

Messrs. Gurney and Sons' gallery was also a very fine one, but not on the ground floor. Their "saloon" was upstairs, This house was one of the oldest in New York in connection with photography. In the very early days, Mr. Gurney, senr., was one of the most eminent "professors" of the Daguerreotype process, and was one of the committee appointed to wait upon the Rev. Wm. Hill, a preacher in the Catskills, to negotiate with the reverend gentlemen (?) for his vaunted secret of photography in natural colours. As the art progressed, or the necessity for change arose, Mr. Gurney was ready to introduce every novelty, and, in later years, in conjunction with Mr. Fredericks, then in partnership with Mr. Gurney, he introduced the "Hallotype," not Hillotype, and the "Ivorytype." Both these processes had their day. The former was photography spoiled by the application of Canada balsam and very little art; the latter was the application of a great deal of art to spoil a photograph. The largest of all the large galleries on Broadway was that of Messrs. Fredericks and Co. The whole of the ground and first floor were thrown into one "crystal front," and made a very attractive appearance. The windows were filled with life-sized portraits painted in oil, crayons, and other styles, and the walls of the interior were covered with life-sized portraits of eminent men and beautiful women. The floor was richly carpeted, and the furnishing superb. A gallery ran round the walls to enable the visitors to view the upper pictures, and obtain a general view of the "saloon," the *tout ensemble* of which was magnificent. From the ground floor an elegant staircase led to the galleries, toilet and waiting rooms, and thence to the operating rooms or studios. Some of the Parisian galleries were fine, but nothing to be compared with Fredericks', and the finest establishment in London did not bear the slightest comparison.

Mr. Brady was another of the early workers of the Daguerreotype process, and probably the last of his *confères* to abandon it. He commenced business in the early forties in Fulton Street, a long way down Broadway, but as the sea of commerce pressed on and rolled over the strand of fashion, he was obliged to move higher and higher up Broadway, until he reached the corner of Tenth Street, nearly opposite Grace Church. Mr. Brady appeared to set the Franklin maxim, "Three removes as bad as a fire," at defiance, for he had made three or four moves to my knowledge—each one higher

and higher to more elegant and expensive premises, each remove entailing the cost of more and more expensive furnishing, until his latest effort in upholstery culminated in a superb suite of black walnut and green silk velvet; in short, Longfellow's "Excelsior" appeared to be the motto of Mr. Brady.

Messrs. Mead Brothers, Samuel Root, James Cady, and George Adams ought to receive "honourable mention" in connection with the art in New York, for they were excellent operators in the Daguerreotype days, and all were equally good manipulators of the collodion process and silver printing.

After casting and sounding about, like a mariner seeking a haven on a strange coast, I finally decided on buying a half interest in the gallery of Mead Brothers, 805, Broadway; Harry Mead retaining his, or his wife's share of the business, but leaving me to manage the "uptown" branch. This turned out to be an unfortunate speculation, which involved me in a lawsuit with one of Mead's creditors, and compelled me to get rid of a very unsatisfactory partner in the best way and at any cost that I could. Mead's creditor, by some process of law that I could never understand, stripped the gallery of all that belonged to my partner, and even put in a claim for half of the fixtures. Over this I lost my temper, and had to pay, not the piper, but the lawyer. I also found that Mrs. Henry Mead had a bill of sale on her husband's interest in the business, which I ended by buying her out. Husband and wife are very seldom one in America. Soon after getting the gallery into my own hands, refurnishing and rearranging, the Prince of Wales's visit to New York was arranged, and as the windows of my gallery commanded a good view of Broadway, I let most of them very advantageously, retaining the use of one only for myself and family. There were so many delays, however, at the City Hall and other places on the day of the procession, that it was almost dark when the Prince reached 805, Broadway, and all my guests were both weary of waiting so long, and disappointed at seeing so little of England's future King.

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