Published in:
Transactions of the Historic Society of Lancashire and Cheshire (Liverpool) vol. 5 (1865): 249–55.

THE HISTORY OF PHOTOGRAPHY TO THE YEAR 1844.

By J. T. Towson, Esq., F.R.G.S.

(READ 9TH FEBRUARY, 1865.)

IN attempting to trace the progress of the Science of Photography, it is necessary to notice several distinct classes of discoveries, the combination of which was necessary to bring about its present advancement.

The mechanical department had its origin at the latter part of the sixteenth century, when John Baptist Porta invented the camera, by means of which instrument the rays of light are arranged so as to produce a picture of the objects from which those rays are reflected. The science of Chemistry in various ways contributed to the production of a photographic picture. In the first place, the action of light produces a change in the affinities of the salts, or other materials of which the photographic preparation consists, for other chemical preparations afterwards employed. This is sometimes attended by a change of the colour of the material acted on by light, but not always so. In this latter case, the developing process is necessary, and, under all circumstances, the fixing process is required to render the picture permanent. The first chemical discovery leading to the science of Photography was made by Scheel [Sheele—ed.] in 1777, who found that the solar ray darkened the chloride of silver. In 1801 Ritter discovered that on the nitrate and other salts of silver a similar effect was produced.

Wedgwood two years afterwards applied the last-named discovery to photographic purposes. He applied the solution of salts of silver to leather, and by this process he obtained copies from paintings on glass. But he remarks that— “No attempts that have been made to prevent the uncoloured parts of the copy or profile from being acted upon by light, have as yet been successful. 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 nitrate of silver.”

Although thus early in the present century advances were made in the science of Photography, it could not be said to exist as an art previously to 1839. It is true that Niepce, as early as 1814, produced pictures in the camera; and in 1829 Daguerre produced, on sheets of silver-plated copper, his pictures known by the name of Daguerreotype. But these discoveries remained hidden to the men of science and art until 1839, when the French Government purchased these secrets.

Immediately on the publication of the discoveries of M. Niepce and M. Daguerre, several English men of science, who had pursued researches in the same direction, were encouraged to exert greater diligence. They received further stimulus to pursue these investigations from the fact that the English artist was deprived, by a patent, of the endowment which the French government had bestowed on "the world of science and of art." This ultimately led to the English School of Photography, that has now superseded the discoveries of Daguerre.

The processes of Niepce and Daguerre brought to light two departments of Photography not previously known—the developing and fixing processes. By their methods the impression made whilst the tablet was in the camera was scarcely, if at all, visible, but was made so by the developing process.

Niepce employed tablets of glass or of silver plated on copper, covered with a thin coating of asphaltum. These were exposed *from six to eight hours* in the camera, when a faint outline only was visible. The development was accomplished by a solvent, that acted less readily on the asphaltum that had been exposed to light, than on that which had remained comparatively in shade.

The process of Daguerre was far more complicated. All his pictures were imprinted on silver plated on copper, and consisted of five operations; and most of these were very delicate, and required very skilful manipulation. Still for several years it defied competition. Perhaps, however, the greatest ultimate value of the discoveries of Daguerre consisted in directing the attention of the photographers generally to the fact, that imperceptible impressions may be made in the camera, which certain developing re-agents, when applied, would render visible.

The "fixing process" of Daguerre may also be regarded as one of the greatest discoveries in connection with Photography, The other methods adopted, previously to his discovery being known, may be described as the rendering that part of the preparation not acted on by light less sensitive, rather than in absolutely protecting it from the further influence of the solar ray. Daguerre's method was by the employment of a solution of hyposulphite of soda, by which he dissolved and thus removed the salts of silver not acted upon by light, rendering the picture absolutely fixed, as far as the further action of light is concerned. The materials employed by others at this time were common salt, iodides or bromides, which converted the whole of the salts of silver not acted on by light into a chloride, iodide or bromide as the case may be. Each of these salts, uncombined with other salts of silver, is far less sensitive than a preparation in which various salts of silver are present in determined proportions. The hyposulphite of soda has been employed down to the present day for fixing photographs; either this salt or the cyanide of potassium is, I believe, now universally employed for that purpose.

Down to the year 1840 still-life objects alone could be depicted by Photography. When Daguerre published his process, a period of twenty minutes was required to obtain a good picture of an object; and the other photographic processes then known required even a longer period of time. Several chemists and others, during this and the former year, had laboured in endeavouring to shorten the time required to produce a photograph. Amongst others thus employed at the period named were Talbot, Claudet, Goddard, Draper, Herschel and Hunt. Professor Hunt and myself pursued this object conjointly during the whole of 1839. I directed my attention principally to the mechanical department—the improvement of the camera for photographic purposes; and Mr. Hunt was principally employed in discovering new chemical preparations applicable to Photography, and in rendering those already known more sensitive. Our labours were both, to some extent, crowned with success. In my experiments on the comparative value of lenses, I found that the quickest were those made of flint glass, and that the thinner the glass the more rapid was the process; and that achromatic glasses were much slower than simple lenses, but that the latter gave a confused and indistinct picture. This I discovered to arise from the luminous ray being subject to a less amount of refraction than the chemical ray;[1] that with a lens or lenses of twelve-inch focus by moving the plate or paper a quarter of an inch, nearer the lens, a picture was produced quite equal to that obtained by means of an achromatic lens,[2] and in less than one-twentieth the time.[3]

I intimated, when I published this discovery, that the use of non-achromatic lenses of large dimensions might lead to the application of Photography to the purpose of portraiture.[4] This expectation was realized, as is shown in the following quotation from the remarks of Professor Hunt[5]:—"Dr. Draper, of New York, acting on the suggestions of Mr. Towson, relative to the adjustment of the focus, succeeded in accelerating his process so far as to obtain portraits from the life."

About the same time I made many experiments with cameras having mirrors instead of lenses.[6] These cameras were very quick, and gave a very distinct picture in the centre of the field, which, however, was very limited. Whilst we were thus successful, Goddard and Claudet were still more fortunate in their attempts to accelerate the process by improvements in the chemical department. Goddard discovered that the use of a small amount of bromine, mixed with the iodine, greatly reduced the time necessary to make the required impression; and Claudet, about the same time, discovered that the introduction of small portions of liquid chlorine produced a similar effect. The union of these two discoveries so accelerated the process as to render it no longer difficult to take portraits from life with every description of camera. Thus, we find that salts of silver, which, when used by themselves, were but little affected by light, greatly accelerated the most sensitive of homogeneous preparations. Mr. Talbot reduced his salts of silver either to a chloride or a bromide, to prevent the further action of light, and yet either or both of these when mixed in small quantities with preparations previously regarded as being very sensitive, were found to quicken the process to a very considerable extent. With the discoveries of Goddard and Claudet the Daguerreotype process attained its greatest progress, as far as the quickness of the process is concerned. It has, however, connected with it, some objection that further stimulated the Photographer to pursue the science in other directions. The Daguerreotype picture was unsuited for various purposes, to which photography is now applied. The reflection from those parts representing shade, requires that the tablet should be held at a certain angle to the line from which the light proceeds. They are unsuitable for being introduced into books or albums.

About the same time I succeeded in taking photographs on glass, but the process was slow and tedious, because no developing process unconnected with Daguerreotype had yet been discovered.[8]

Next to Daguerre, Mr. Fox Talbot introduced the developing process. In 1841 he invented the Calotype, which at that period, next to Daguerreotype, was the most sensitive; but Calotype, as it now exists, has been improved by the discoveries of Mr. Cundell, whose process appeared in the *London and Edinburgh Philosophical Magazine* for May 1844. About the same time Hunt discovered his Ferrotype, which to a considerable extent has brought down the science of Photography to the present day.

The great value of this discovery was the developing power of the *photosulphate* of iron. This, notwithstanding the improvements that have been discovered during the subsequent twenty years, still remains in use and may be regarded as one of the greatest discoveries in connexion with Photography, as it is now in practice, that was made at that early period.

The prepared paper on which positive photographs are now printed from the negative, may be regarded as amongst the earliest of those practised by the English School of

Photography. Fox Talbot in 1834 prepared a paper very similar to those now in use for printing from negatives; and when in 1839 the hyposulphite of soda was employed for the purpose of fixing the picture, little remained for future discovery, except by varying the solution, by which the paper is prepared, so as to quicken the process and improve the tone of colour, and the manufacture of paper expressly for photographic purposes.

Since the period we have referred to in this paper, great progress has, however, been made in producing negatives of far greater value than any of those known at that period. These improvements have principally been founded on the use of collodion, the invention of Mr. Archer and Mr. Fry.[8]

In this paper it has not been attempted to enter into any details, but merely to trace the foundation of Photography, which was laid in the five years commencing with 1839, after which period I have had but little practical acquaintance with the science.

The history of the progress of the science and the art of Photography, affords a striking illustration of the gradual manner in which many interesting discoveries are developed. After the publication of the discoveries of Daguerre, for a short period a feeling of universal astonishment was excited. But this gradually subsided; whilst, at the same time, Photography, as a science, was progressing. In 1850 the writer of the article, "Photogenic Drawings," in the *Penny Cyclopedia* says,[9] "Now that the first novelty has worn off, " the interest taken by the public in the discovery has greatly "diminished." Six years subsequently, in the supplement to the same work, after describing the progress that had since been attained, the writer remarks,[10] "Of an art so new, it would be "premature to attempt to enumerate the advantages." And so to the present time, new appliances of the art are continually being brought into operation; and we may now say that there scarcely exists a family within the pale of the civilized members of the human race, that is not, to some extent, indebted to the Photographic art. Several sciences have also received its aid, Astronomy and Archaeology amongst the number; and from time to time we still hear of some new application of this valuable and interesting art. As a science its resources have been more slowly developed, but may ultimately be found of equal value.

1. See the *London and Edinburgh Philosophical Magazine*, for November, 1839, page 381, and Hunt's *Manual of Photography* (1854), page 169.

2. Claudet shows, in the *London and Edinburgh Philosophical Magazine*, 1844, that the luminous and chemical foci were not of the same length, even with achromatic lenses. Achromatic lenses are, however, generally used at present in this country; but in America a combination of simple lenses. The lenses of some very quick cameras, used in this country for taking portraits of children, are similar to the one I described in 1839.

3. The chemical ray has since been denominated "actinism."

4. The *London and Edinburgh Philosophical Magazine*, November, 1839, page 385.

5. *Ibid*., September, 1840 and 1844. Also, Hunt's *Manual of Photography*, page 96.

6. Hunt's *Manual of Photography*, page 99, where a drawing of my reflecting camera is also given. In taking a Daguerreotype, or any other positive picture, in the camera, the reflector had the advantage in depicturing the right for the right and the left for the left, whereas in the refracting camera right and left were reversed; but this defect is corrected by printing positive pictures from negatives taken in the refracting camera.

7. In the *Manual of Photography*, page 94, Professor Hunt thus describes my process:— "Mr. Towson employed glass plates, prepared in this manner, with much success. The mode adopted by that gentleman was, to have a box the exact size of the plate, in the bottom of which was a small hole; the glass was placed over the bottom, and the mixed solution, just

strong enough to be milky, of salt and silver poured in. As the fluid finds its way slowly around the edges of the glass, it filters out, separating the fine precipitate which is left behind on the surface of the plate." I may add that this precipitate, when dry, adheres firmly to the surface of the glass; which, previously to being placed in the camera, was dipped into a bath of a solution of nitrate of silver.

8. It is greatly to be regretted that we cannot determine whether the collodion process had its origin with Fry or Archer. This defect in the history of the discoveries made subsequently to those described in this paper, arose from the fact that neither Archer nor Fry published his invention until after it had been practised by others. It is, however, very probable that both these gentlemen made this discovery independent of each other.

9. See volume xviii, page 113.

10. See first supplement, article "Photography," volume xii, page 420.

[End of text. For clarity, original symbol footnotes have been revised to numbers.]

EDITOR'S NOTES:

See also John T. Towson, "On the Proper Focus for the Daguerreotype," *London and Edinburgh Philosophical Magazine and Journal of Science* (London) 15:97 (November 1839): 381–85.[1]

1. http://www.daguerreotypearchive.org/texts/P8390028_TOWSON_PHILO-MAG_1839-11.pdf

that would not be used today. The words remain in the transcription, however, to maintain truthfulness to the original text.