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Letters to the Editors

BREWSTER'S AND CLAUDET'S TOPAZ CAMERA LENS, 1867

G. L'E. Turner in his interesting paper, *The rise and fall of the jewel microscope, 1824-1837* [1] has described Sir David Brewster's part in the development of Jewel Microscopes in the 1820's and their abandonment after a dozen years due to improvements in the compound microscope.

It is of interest that some forty years later, in the last year of his life, Brewster was again involved in the development of a jewel lens, this time a topaz camera lens. His friend, the distinguished photographer Antoine Claudet (1797-1867)[2,3], corresponded with him in 1867, and five of Brewster's letters, dated between March, 1867, and August, 1867, were published in the following year in an extensive obituary of Claudet.[2]

Claudet's greatest aspiration during the later years of his life was to take the Perfect Portrait, and to create the Perfect Portrait Lens believed so essential to this end. Within the concepts imposed by the large long-focus lenses of the day, Claudet searched for methods to overcome the various problems involved.[4,5] One of these problems was an imperfect image due to a stereoscopic effect from the opposite edges of the lens (Claudet had a lens 5-in diameter), or in Brewster's words, 'the error arising from the superposition of different views of the figure as seen from different points of the lens'. He and Brewster hoped that by the use of a topaz lens they would be able to reduce the aperture of the portrait lens 'to the size of the human pupil', or to the 'infinitely small pin-hole which is the most perfect carnera; and the nearer we can approach to the smallest and thinnest lens, the nearer do we approach to a perfect portrait.' Brewster believed that if 'the numerous refractions, and surface reflections. and the thickness of glass, may affect the expression of the human face, then the single lens, of least dispersion, aberration, and thickness, is the most perfect of photographic instruments, when the chemical process is sufficiently sensitive.' He wrote to Claudet in March, 1867: 'No proper experiment has yet been made to ascertain the effect of a single lens of diamond … I wish you would enter upon this enquiry. You are the only person I know fitted to do it.' On 20th August Brewster wrote: 'Your portrait by the topaz lens is *Perfect*. Nothing can surpass it, and it is hardly necessary for you to try the one-fourth of an inch aperture...'.

Claudet read a paper at the British Association Meeting in Dundee on 9th September that year, entitled 'On photographic portraits obtained by single lenses of rock crystal and Topaz'. [6,7] He had used a single topaz lens 'with the curves of 6 to 7 ...requiring a sitting 5 or 6 times longer than when we operate with a quick double achromatic lens... so that in practice, for portraits, small topaz or rock crystal lenses would be but slightly available.' When Claudet died later that year, on 27th December, 1867, his son intended to present to members of the Royal Photographic Society a portrait of his father - the last negative taken by the topaz lens.[8] Unfortunately soon after Claudet's death there had been a calamitous fire at the studio which had ruined the negative. Luckily, Claudet had given his friend the Rev. J. B. Reade[10] an original print, and copies were made from this for all the members of the Society. On the back of the print were the following words - 'Taken in November, 1867, with a topaz lens 5/8 in. aperture, focus 16 1/2 in., distance 11 feet from sitter, visual focus 33 inches behind.'[8, 9]

In view of what Mr Turner tells us of the history of the jewel microscope, it is of interest that one of the reasons put forward by Brewster for the use of the jewel lens in the camera was as a single lens as opposed to compound glass lenses. Improved emulsion speed and the attendant lens changes made Brewster's and Claudet's ideas and experiments superfluous. Nevertheless, this episode is another example from the history of science from which, as Mr Turner says, we can gain understanding; for knowledge of obsolete concepts can be a stimulant to the scientist today in his own search for a conceptual 'lens' to reveal nature.

REFERENCES

1 TURNER, G. L'E. (1968). The rise and fall of the jewel Microscope, *Microscopy*, **31**, 85-94.

2 ELLIS, JOSEPH (1868). Claudet -- A Memoir, reprinted from the Scientific Review, August, 1868, in Phot. J., **13**, 101-108.

3 Brewster and Claudet were old friends. The stereoscope was one of their common interests. Brewster had given an outline of Claudet's earlier work in 1861 when presenting him with a medal at the Photographic Society of Scotland (Phot. J. (1861) **7**, 183-184) and would have written a detailed obituary of his friend, but he died only six weeks after Claudet.

4 CLAUDET, A. (1866). *Phot. J*., **11**, 136-144; (1867). *Brit. J. Phot*., 14, 232-233 and 438. Claudet had elaborated a system of moving the back component of the portrait lens during exposure, to deal with the problems of short depth of field, and to settle the soft versus hard-focus debate. This system was his 'Focus Equaliser', 'a means of introducing Harmony and Artistic effect in photographic portraits by equalizing the definition of various planes of the figure'.

5 Editorial (1866). Depth of focus - softness v. sharpness. *Brit. J. Phot*., **13**, 412-413.

6 CLAUDET, A. (1867). On photographic portraits obtained by single lenses of rock crystal and topaz, a paper read at Brit. Assoc. and reported in *Brit. J. Phot*., **14**, 439.

7 Discussion after Claudet's paper (ref. 6) at Brit. Assoc. by J. Clerk Maxwell and Sir Wm. Thomson (concerning a 'Physiological Theory ' of Claudet's ideas),. *Brit. J. Phot*. (1867), 14, 439.

8 READE, J. B. (1868). Chairman's remarks at meeting. *Phot. J*., **13**, 10.

9 'Claudet's Presentation Print', *Phot. J*. (1867), **13**, 223.

10 READE, J. B. (1868) wrote an obituary of Claudet. Proc. Roy. Soc., 17, lxxxv–lxxxvii.

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3 January, 1969.