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(*b*. Melbury House, Dorsetshire, England, 11 February 1800; *d*. Lacock Abbey, Wiltshire, England, 17 September 1877)

photochemistry, mathematics.

Talbot was the only child of William Davenport Talbot, an officer of dragoons, and Lady Elisabeth Theresa Fox-Strangways, the eldest daughter of the second earl of Ilchester, Four years after his father's death in July 1800, his mother married Rear Admiral Charles Feilding, who established a warm relationship with his stepson. Talbot grew up with two half sisters in an upper-class family that possessed both social position and culture.

While studying at a boarding school in Rottingdean and later at Harrow, Talbot distinguished himself as a scholar. At age seventeen he entered Trinity College, Cambridge, where he studied classical languages and mathematics, receiving in 1820 the Porson Prize for Greek verse, and graduating in 1821 as twelfth wrangler and second chancellor's medalist. Soon thereafter he published a half dozen papers on mathematics but spent much of the next decade traveling on the Continent, living the life of a gentleman scholar. He established himself in the late 1820's at the family estate, historic Lacock Abbey, ran successfully as a Liberal from Chippenham for the first reform Parliament (1833 – 1834), and on 20 December 1832 married Constance Mundy of Markeaton, Derbyshire. Talbot was an active member of numerous scholarly and scientific societies, including the Royal Society, the Royal Astronomical Society, and the British Association for the Advancement of Science.

Talbot's formative years were spent under the influence of the dominant Romantic atmosphere of England and Western Europe. He frequented Romantic operas and concerts and avidly read the works of Goethe, Byron, and Scott, naming two of his daughters after characters in Scott's works. His love of nature manifested itself in his lifelong interest in flowers and in his penchant for travel. His fondness for the past was stimulated not only by Scott's historical novels and by his own historic estate, but also by Young and Champollion's deciphering of the hieroglyphics on the Rosetta Stone in the early 1820's and Rawlinson and Hincks's deciphering of the Assyrian cuneiform in the middle 1840's. These stimuli merged with his flair for languages to initiate a lifelong series of translations from Assyrian and other ancient languages and of historical and philological studies. Beginning with a book of Greek verse. *Legendary Tales* (London, 1830), these translations and studies included four other books and at least sixty-two articles in scholarly journals.

After completing his study at Cambridge, Talbot continued his work in mathematics, systematically studying elliptic integrals. Building upon the earlier achievements of Fagnano dei Toschi, Euler, Legendre, Jacobi, and Abel, he addressed himself to the problem of summing the integrals of any function. His early mathematical work led to his election as a fellow of the Royal Society, while his work on elliptic integrals brought him the Royal Medal of the Society for the year 1838 and an appointment to the Royal Society council.

During the same period Talbot's interests in chemistry and optics quickened, and he gradually adopted a unified, dynamic view of physical phenomena. The early nineteenth century witnessed the adoption and modification of new theoretical frameworks in chemistry and optics. The discovery of many new substances stimulated increasing concern with chemical composition and structure, while the wave theory of light posed problems with dispersion, absorption, photochemical reaction, and other forms of light-matter interaction. Although Talbot counted Wheatstone, Brewster, and Babbage among his scientific friends, he most closely followed the ideas of his friend John Herschel on light. Adopting the wave theory of light and a kinetic interpretation of light, heat, and matter, he pursued the problem of light-matter interaction through the study of optics, crystallography, and spectra. Intrigued by the similar optical characteristics of light and radiant heat as demonstrated by Melloni and Forbes, he sought to show the unity of the chemical rays with visible rays and heat rays. He also sought to use light and optical properties as analytical tools in order to determine the nature and structure of matter and to develop methods of chemical identification. Utilizing the vibratory theroy of molecular behavior in gases, he suggested in 1835 a connection between spectral lines and chemical composition. In an 1836 paper he employed the polarizing microscope as a tool to explore “the internal structure of transparent bodies, even in their minutest visible particles” (*London and Edinburgh Philosophical Magazine* [1836], p. 288). This paper brought him the honor of being named the Bakerian lecturer of the Royal Society for the year 1836.

It was with the development of photography that Talbot's love of nature and landscapes merged with his interests in optics and photochemistry. His efforts to sketch Italian scenery had met with repeated frustration. When he realized that he lacked artistic talent, he turned in 1823 to the use of a camera obscura as a drawing aid, but without satisfaction. Again in October of 1833, while honeymooning on the shores of Lake Como, he met with failure when he used Wollaston's recently developed boon to nature lovers and amateur artists, the camera lucida. At that time it occurred to Talbot to imprint the image on chemically sensitized paper. Returning to England in January 1834, he and his assistant, Nicholaas Henneman, conducted many experiments; by 1835 they were able to obtain “negatives' by employing tiny camera obscuras and paper sensitized with excess silver nitrate and fixed with excess common salt. Between 1835 and 1839, Talbot and Henneman continued their experiments, motivated by a desire for an analytic tool for research on radiant heat and light, as well as by a desire for reproducing images from nature. Following Arago's announcement to the Académie des Sciences 7 January 1839 of the existence of Daguerre's photographic process, Talbot became concerned over the priority of his work; he frantically sought to improve his process prior to the disclosure of Daguerre's. Nevertheless, Daguerre's process proved to be vastly superior to Talbot's in the quality of the image. In September 1840 Talbot discovered that gallic acid would develop a latent image on paper, and he called this new process the calotype. He patented and then disclosed the process in a paper presented to the Royal Society in June of 1841.

Although Talbot's photographic efforts did not meet with major commercial success and, because of his efforts to enforce his patents, did not win him popular acclaim, his paper on the calotype did bring him the honor of the Rumford Medal of the Royal Society (1842) for the most outstanding piece of research on light during the previous two years. In the middle 1840's he published two of the earliest books illustrated with photographs. Although twenty-eight of his fifty-nine scientific papers were published after 1840, most of these were minor papers on photography and mathematics. In 1852 he patented and published a method of photoengraving called photoglyphy. From the mid 1850's, with the increasing public clamor over his patent suits. Talbot's interests shifted increasingly to philological and historical studies. Despite the significant contribution he made in these scholarly pursuits. It was his development of the first negative-positive process in photography–that union of his naturalistic and artistic inclinations with his unitary photochemical interests–that brought him his greatest recognition both during his lifetime and after his death.

BIBLIOGRAPHY

I. Original Works. Talbot's published scientific work appears exclusively in the fifty-nine articles listed in the *Royal Society Catalogue of Scientific Papers*. His two books illustrated with calotypes are *The Pencil of Nature*, parts I – VI (London, 1844 – 1846), and *Sun Pictures in Scotland* (London, 1845); his own remarks are contained in Appendix A of G. Tissandier, *A History and Handbook of Photography* (London, 1878).

Considerable data are contained in the legal records of the Court of Chancery, Public Record Office. London: Talbot *v* Colls (1852), and Talbot *v* Henderson (1854).

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II. Secondary Literature. The only biography of Talbot is Arthur H. Booth's *William Henry Fox Talbot* . . .(London, 1965), which is superficial and unreliable. Even the best sources restrict themselves largely to Talbot's photographic work. These include R. Cull, "Biographical Notice of the Late William Henry Fox Talbot," in *Society of Biblical Archaeology. Transactions*,**6** (1878), 543 – 549; *Dictionary of National Biography*; H. Gernsheim, "Talbot's and Herschel's Photographic Experiments in 1839," in *Image*, **8** (1959), 132 – 137; H. and A. Gernsheim, *History of Photography* . . .(New York, 1969); A. Jammes, *William H. Fox Talbot, Inventor of the Negative-Positive Process* (New York, 1973); J. D. Johnston, "William Henry Fox Talbot . . ., Part I," and J. D. Johnston and R. C. Smith, "Part II," in *Photographic Journal*, **87** A (1947), 3 – 13, and **108** A (1968), 361 – 371; B. Newhall, "William Henry Fox Talbot," in *Image*, **8** (1959), 60 – 75; E. Ostroff, "Restoration of Photograph . . .," in *Science*, **154** (7 Oct. 1966), 119 – 123; M. T. Talbot, "The Life and Personality of Fox Talbot," in *Photographic Journal*, **79** (1939), 546 – 549; D. B. Thomas, *The First Negatives* (London, 1964); and R. D. Wood, "The Involvement of Sir John Herschel in the Photographic Patent Case, Talbot *v* Henderson, 1854," and "J. B. Reade . . .," in *Annals of Science*, **27** (Sept. 1971), 239 – 264, and **27** (March 1971), 13 – 83.

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