Joseph Barnard had a long association with the Royal Microscopical Society and was elected a Fellow in 1889. He served the Society in various official capacities: as Secretary from 1920 to 1927; President for three periods — 1918 to 1919, 1928 to 1929 and 1938 to 1945. In the Centenary Year of 1941, his Presidential Address recalled the many prominent microscopists with whom he had been associated during his membership. In almost the last visit he paid to the Society in 1948 he was given the Honorary Fellowship, an honour he much appreciated. He was also a Fellow of the Royal Society and of the Institute of Physics.

In 1911 he was probably a founder-member of the Photomicrographic Society and was its President in 1915 to 1916 and 1920 to 1921. The Barnard Certificate will serve to keep alive the memory of a very distinguished microscopist who was proud to be an amateur all his life. He died on 25th October 1949 in his seventy-ninth year.

I am grateful to his daughter, Mrs D. M. Corrie for the loan of the portrait of her father.

Reference

Royal Microscopical Society. Vol. LXXXI (1951). Obituary: Joseph Edwin Barnard, 104-112.

John Clegg.

Book Reviews

BRIAN BRACEGIRDLE AND JAMES B. MCCORMICK — *The Microscopic Photographs of J. B. Dancer.* Science Heritage Limited, Chicago. 1993.
ISBN 0-940095-10-6.

Today's fashion seems to be for miniaturization, especially for electronic devices such as radios and television sets, and their components — transistors, capacitors, resistors and integrated circuits. The fabrication of such devices, often requiring extremely high resolution photographic processes coupled with mechanical accuracy of a high order, does not pose too great a problem for modern technologists and engineers with their sophisticated equipment. Indeed, some would assert that this very sophistication has resulted in the reduction of much of the skill required for their manufacture.

To many, mention of the Victorian engineers and scientists suggests just the reverse; massive steel and iron civil engineering works, such as bridges and viaducts, machinery, trains and ships. This trend carried over to some of their microscopes which also tended to be large and heavily built. All their products were constructed without our modern technology but with an equal or even greater degree of individual technical craft skill. One other feature, perhaps less obvious today in the era of mass media entertainment, was the interest the Victorians had in other areas, many of them actively pursuing music, art, the newly-developing art of photography, and often a deep interest in nature and the minute microscopic world.

John Benjamin Dancer was no exception, also possessing a wide range of interests, although having had relatively little formal education. He was largely taught by his father and at the age of 23 followed (on the latter's early death) into the family optical business. John was evidently an ingenious character, and an active inventor and improver. Among his achievements were the use of limelight for projection of lantern images, many developments to electrical apparatus such as galvanometers and the invention of the porous ceramic separator for the compartments containing the two solutions in the Daniell electric batteries. This wide breadth of experimentation continued all through his life until prevented by failing eyesight in his later years. Almost as soon as news of the invention of the Daguerrotype reached Liverpool where Dancer was then living, he began experimentation with it, just as he had experimented with Fox Talbot's process. Soon (in 1840) Dancer produced in public a photomicrograph Daguerrotype of the image of a flea. Not only did he produce a Daguerrotype of enlarged images but in 1839 succeeded in using the same process to produce a tiny image (what would later be termed a microphotograph) by using a microscope objective. This allowed him to produce an image one eighth of an inch long of an object 20 inches in length. Since the image was on a Daguerrotype plate, the background was opaque but, because of the size of the particles of mercury making up that image, the maximum magnification which could be used for viewing it was limited to about ×20. In 1841 J. B. Dancer entered into a short-lived partnership with an optician named Abraham and moved to Manchester where he remained for the remainder of his life working as an optician and scientific instrument maker and retailer.

In 1851 F. Scott Archer described his invention of the wet collodion process for photography and immediately Dancer resumed his experiments in microphotography, this time using the new process. The result was that in 1853 he produced a practical method for making micro-photographs which he began to sell as novelty slides bearing his characteristic yellow printed label. It seems inevitable that with any invention there should be a controversy over precedence, and microphotographs were no exception, a George Shadbolt claiming priority. The claim was soon, however, settled in favour of Dancer who eventually listed 277 varied subjects in his catalogue. Later in life Dancer was forced by ill health to retire from business and his two daughters carried on the business. Eventually (in 1896) they sold the entire resources to Richard Suter, a well-known London preparer of microscope specimens who carried on selling microphotographs; the list in his own catalogue eventually stretched to 512 different titles. Shortly after the introduction of Dancer's microphotographs Sutton in his

Dictionary of Photography published in 1858 commented that the process 'was of little or no practical utility'. Twelve years later, however, a Frenchman named Dagron was using Dancer's method to send messages into and out of Paris (which was then under siege) by using carrier pigeons. Today microphotography is a commonplace technique being universally used for the archiving of documents and books.

The present book represents a fitting memorial to Dancer's genius. It, like so many of his microphotographs, is a work of art. There is an admirable biographical sketch of Dancer's life, together with full details of the wet collodion process. This latter gives all the formulae for the necessary reagents (with quantities not only in the original units but also translated into their modern metric equivalents) and lists the technique for preparing, sensitising and development of the plates; when time permits I certainly intend to experiment and see how hard it really was for a mid-Victorian photographer!

The book also contains lists of the known distributors of Dancer's microphotographs, together with lists of other suppliers of these specimens, and facsimiles of Dancer's 1873 catalogue and of Suter's 1900 catalogue listing all the titles. Similar facsimiles are provided of the micro-photographic sections of several other microscopical suppliers. By a remarkable chance the many of the original 4″ × 5″ glass negatives made by Dancer have survived. Stored by Mrs Peirce (a sister of Richard Suter), they passed into the keeping of A. L. E. Barron who kindly allowed the authors of the present book to use them as illustrations. From an illustrated section on the technique it is clear that Dancer fixed his originals to a copy board and on occasion often stuck a new original on top of one already copied. On one or two of the negatives reproduced in the book clear images of blowflies can be seen, so it is probable that the copying was done outside in a bright light and hence a relatively short exposure time was possible. The main body of the work gives, for each extant microphotograph, the number, title, source of the illustration, together with a photograph of the subject as it would be seen under the microscope. There is also an illustration of the actual slide itself to show details of the label. Where the original negative is available this is used to provide the main illustration, but where the negative has not survived then the actual micro-image on the slide is used instead. All the extant Dancer and Suter slides are treated in this way. The value of this book for the scholar and interested collector is, however, tremendously enhanced by the text used to comment on each slide. These descriptions are the work of Hilary Bracegirdle, the holder of a post-graduate qualification in museum work and now at the Victoria and Albert Museum. Her carefully researched material is fascinating and is a source of delightful facts to complement each micro-photograph. For example, to choose one at random, with respect to slide No. 191C (– an illustration of the title page of "Punch" for July 26th, 1862) we find that not only is the significance of the political cartoon explained but some of the other contents of that same issue are mentioned. Apparently "Punch" was then conducting a campaign against the wearing of crinolines and made a habit of publishing terrible jokes and riddles such as:

> Question:— "When is a needy shoemaker like a dying whale?
>
> Answer:— "When he has spouting his last."

The variety of the subjects chosen by Dancer is tremendous. They range from illustrations of memorial tablets, through religious texts such as the Lord's Prayer and extracts from the Sermon on the Mount to popular ballads and poems of the day; there are extracts from the novels of Dickens and portraits of Royalty, Statesmen and eminent politicians of the day. There are illustrations of churches, cathedrals, abbeys, stately homes and those embodiments of Victorian sentimentality — the paintings of artists such as Landseer and Winterhalter.

The book itself is beautifully produced in a large format, on high quality paper, and comes in its own slip case. It is not only an invaluable source of information on Dancer, Suter and the microphotograph, but it is also a book which one constantly dips into at random for the pleasure the illustrations and text provide. When one sees a production such as this, those who affirm that detailed and accurate historical work on even a minor area of microscopy must inevitably be dull and lifeless, are clearly and resoundingly contradicted!

S. Bradbury.

P. C. Robinson & S. Bradbury — *Qualitative Polarized-light Microscopy*. Oxford: University Press, 1992. RMS Handbook 09.
ISBN 0-19-856410-4. pp.121, illust. £13.95.

As with other books in the RMS Microscopy Handbook series, this is intended to be an introduction to its subject, assuming little previous knowledge apart from some basic physics. It can be said now that the authors have met this requirement admirably.

After a brief introductory chapter, the wave nature of light, interference, polarization, and optical anisotropy are clearly explained. From these concepts, the optical properties of uniaxial crystals and the function of retardation plates and wedges are developed, preceding their further treatment in chapter six. The polarized light microscope is then considered, highlighting the special features required; the caption to fig. 3.1 purports to show the *mean* features of such a device! Optical anisotropy is next considered in greater depth, and a brief introduction to the optical properties of biaxial crystals and pleochroism is provided.

Chapter five describes observations using plane polarized light, simple refractive index measurements, and dichroism. Following this, the important topic of polarization colours, how they arise, the information they give about the specimen, and the use of retardation plates is covered very