Philip Carpenter (1776–1833) born in Kidderminster, Worcestershire on 18th November 1776, had a brilliant optical understanding and in just 25-years of unsurpassed technical ambidexterity, led the world in both magic lantern projection and microscopical magnification. Abiding proof remains with his apparatus and records of his public ‘Microcosm’ exhibition which achieved great celebrity when George the Fourth of England was King.

He died at Regent Street on 30th April 1833 and the business was continued by his sister Mary in partnership with William Westley (d.1887) (Fig.1), an early Birmingham apprentice to Carpenter, who became foreman, and later on a partner, and ultimately sole principal.¹

This article examines the transition from his beginnings in the Birmingham optical trade in Inge Street in 1808 then in 1815 to a house and manufacture at Bath Row with shop premises at 111 New Street and later 33 Navigation Street Birmingham, becoming Carpenter & Westley in 1835. This name would continue in Regent Street until the 1920s.² After just 18 years in Birmingham, Carpenter’s sudden expensive re-location to the heart of London in July 1826 confirms his eminence. Birmingham was at the forefront of the Industrial Revolution and Philip Carpenter’s career epitomizes this epoch.

The Resources, Products and Industrial History of Birmingham edited by Samuel Timmins published in 1866 quotes:

About 1808, Mr. Philip Carpenter, the founder of the firm of Carpenter & Westley, commenced business in Birmingham in a more systematic manner than had been known before. Achromatic lenses had raised telescopes from mere toys to philosophical instruments and Mr. Carpenter soon established a large trade, and supplied even Dollond (Peter Dollond 1731–1820) himself with optical instruments and Mr. Carpenter lenses had raised telescopes from mere toys to philosophical instruments and Mr. Carpenter soon established a large trade, and supplied even Dollond (Peter Dollond 1731–1820) himself with optical instruments and Mr. Carpenter soon established a large trade, and supplied even Dollond (Peter Dollond 1731–1820) himself with the required specifications, advanced his standing by his sister Mary in partnership with William Westley (d.1887) (Fig.1), an early Birmingham apprentice to Carpenter, who became foreman, and later on a partner, and ultimately sole principal.¹

Important to note the parallel develop-
especially the famous astronomical series, and the many and varied categories retain their design hallmark of an enduring built-to-last quality.

Both The Elements of Zoology7 (1823) and his printed lecture Companion to the

Magic Lantern (1823) were great presentation advances. With additional refinements such as the Chromatope where two interacting rotating discs produced complex kaleidoscopic images, and the remarkable ‘Dissolving Views’ Twin Lanterns (Fig. 2).8 These optical projection successes without doubt financed his move to the heart of London at 24 Regent Street in 1826.

Carpenter’s Microscopes

Leading opticians between 1820 and 1833 were then unlocking the mysteries of the achromatic microscope objective included James Smith (until 1838 foreman at Tulley and Sons of Islington), Hugh Powell, Andrew Ross and J. B. Dancer. These younger generation opticians also made and supplied the Carpenter Microscopes to his design specifications. Carpenter’s only known 1834 catalogue of just 16 pages9 notes: ‘microscopes are all securely packed in neat French-polished mahogany cases.’

Indeed they are remarkable for their presentation in Regency period beveled-edge mahogany boxes with superb flame mahogany veneers to the outer lid and plush velvet cushions to the inner lids. The addition of an oil or Argand Lamp for extra illumination as a top option was another innovation. This attention to technical design, build-quality and boxed presentation with the exceptional opaque and transparent specimen slides that accompanied all his microscopes is the reason Carpenter’s reputation is so highly rated.

‘Carpenter’s Improved, Opake and Transparent Compound Microscope’—a compendium; and perhaps the finest example extant and priced at £30 in the 1834 catalogue, is seen in Museum of the History of Science in Oxford and pictured on page 100 of Gerard Turner’s 1981 classic introduction to Collecting Microscopes (StudioVista /CSK 1981). Engraved plates taken from Carpenter’s leaflets which accompanied his ‘improved’ microscopes

Fig. 3 Carpenter’s Improved Compound Microscope. Author’s Collection.

Fig. 4 Carpenter’s Most Improved Compound Microscope. Author’s Collection.

Fig. 5 Philip Carpenter’s shop at 24 Regent Street, at the corner of Jermyn Street, London; drawing by George Scharf, 1828 (see note 11). Courtesy of the Trustees of the British Museum.

Fig. 6 Carpenter’s shop front; drawing by George Scharf, 1828 (see note 11). Courtesy of the Trustees of the British Museum.
are seen in Figs 3 and 4, at £14 guineas and £21 respectively in the 1834 catalogue.\textsuperscript{10}

Carpenter’s Microcosm

Philipp Carpenter himself published a commentary, the only copy of which remains in the British Library.\textsuperscript{11-13} Fortunately two period drawings (Figs 5 and 6) of Carpenter’s shop at 24 Regent Street were made by the illustrator Georg Scharf (1788-1860). Above the doorway are the lower ‘Carpenter Optician’ and above ‘MICROCOSM’, and in the sketch the upper door-glass is lettered ‘Microcosm open from Eleven till Eight’.\textsuperscript{14}

A wonderful coloured etching dating 1828 ‘Monster Soup commonly called Thames Water’ by William Heath (c.1795-1840) (Fig. 7) was inspired by Carpenter’s lucernal projections, as demonstrated by the well-known ‘Microcosm’ Trade Advertisement (Fig. 8). Clearly this unique exhibition on the ‘Wonders of Nature’ caught the public imagination and was possibly petrifying.\textsuperscript{15}

The late John Millburn suggested ‘that the window in the room above Regent Street appears to incorporate some sort of apparatus which could have been the solar collector’.\textsuperscript{16}

A contemporary description of the Microcosm Exhibition was published in 1828 in Arcana of Science - a rare copy belongs to Lester Smith of the Magic Lantern Society who has kindly consented to this reproduction of the text (right).\textsuperscript{17}

A brief reminder of Philipp Carpenter’s many inspired and creative contributions to the field of optics and the wonders of projection – his career has enduring fascination to followers of the history of the Magic Lantern and the Microscope.

Acknowledgments

Sincere thanks to Professor Gerard Turner, Dr. Alison Morrison-Low, Dr. Brian Gee, A. V. Simcock, and Messrs. Roger Few, David Robinson & Lester Smith - Members of the Magic Lantern Society.

Notes and References

3. Samuel Timmins, The Resources and Products and Industrial History of Birmingham (London 1866). p. 534 Timmins implies that Carpenter made the first solar microscope which is, of course, not correct. However, he may well have put together the first permanent solar microscope exhibition.
5. Josie A. Marsden, Lamps and Lighting, Popular

Microscopical Exhibition

A unique Microscopical Apparatus, on a scale of great magnitude, has very recently been established in Regent-street, London by Mr. Philip Carpenter, optician. It consists of a truly magnificent collection of microscopes, and well-selected objects that we cannot avoid earnestly recommending our readers to avail themselves of an early visit of it.

They chiefly consist of twelve lucernal microscopes, of great length and size, and which are kept constantly fixed in the most convenient and favorable position for using them; their foci being also adjusted, so that the observer has only to change the objects from time to time, at pleasure, by merely turning a large milled head, made of brass, which, by means of a long rod, communicates with the supports of them; these are the facilities hitherto un-possessed by any instruments of the same description which we have met with, and which renders the use of the microscopes exceedingly easy and convenient.

There are generally three sets of objects to each microscope, and these are also changed from time to time, so that novelty will never be wanting in this pleasing exhibition. The Objects are held in glazed frames, and are exposed on the outside of the house, to the full influence of daylight, and, at night, are illuminated by lamps the flames of which are reflected upon the objects by adjusting specularums. Some of the objects are placed at the distances of from six to nine feet from the eye of the observer; and the lenses, in the body of the microscopes, are several of them from nine to sixteen inches in diameter, and have cost a very considerable sum in the fabrication.

By this judicious arrangement, the pleasure arising from the inspection of the minute and most exquisite works of creation, on a greatly magnified scale, is brought within the reach of everyone, not only of the scientific world, but of the public in general, and who are thus afforded a treat, hitherto enjoyed by the few who possessed good microscopes and the requisite skill to use them, skill which was only to be acquired by long practice.

Among the opaque objects, the diamond curculio forms, as it ought a conspicuous one. It is exhibited entire, on a magnificent scale, and also in separate parts, still more magnified. In the transparent ones, the cells in paste are beautifully shewn, also the cheese mites and the water fleas, alive, and exerting their peculiar movements.

Mr. Carpenter has also fitted up a large concave specular, in a peculiar manner, so as to exhibit magnified views of larger objects, exceedingly well lit and defined; as, for instance, two large Indian cerambyxes, a locust, with its wings fully displayed, and a coralline. These are also viewed with both eyes open, an advantage which cannot be obtained in the other instruments, which, however, does not fatigue the eye of the observer in the least degree.
6. A.D. Morrison-Low & J.R.R. Christie, eds., Martyr of Science—Sir David Brewster 1781-1868 (RSM Symposium 1981), pp. 62 and 63 and Cat. 7, Fig. 18, p. 86.
7. The full title of this small volume is Elements of Zoology: being a concise account of the animal kingdom, according to the system of Linnaeus (London, 1825).
10. Ibid.
17. Arcana of Science (1828), Vol. 1 p. 14-15 - extract by kind permission of the owner Mr Lester Smith his Ref. 12/02, and Trade Label Ref. 6/02.

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Fig. 8 ‘Microcosm’ Trade Advertisement (see Calvert, note 12). Original in the Court Collection, Science Museum, London.