



## One Anniversary – Over a Year of Celebrations!

As most of the membership will be aware, 2014 was a significant milestone in the history of the Royal Microscopical Society. The RMS celebrated its 175th Anniversary on 3 September and there have been a variety of events marking the milestone.

An anniversary provides the Society with a number of opportunities. Of course the Society itself should celebrate its own birthday, particularly given the vibrant state that it is currently in, but the anniversary can also be used as a way of raising the profile of the Society and establishing engagement with new parts of the scientific community, the first event very much addressed the latter point.

## House of Commons Reception: Innovation under the Microscope

9 July 2013

The first official celebration actually took place in July 2013 at the House of Commons. The evening reception was convened by the outgoing RMS President, Professor Tony Wilson and was hosted by Nicola Blackwood the MP for Oxford West & Abingdon. The aim of this event was to celebrate the

importance of microscopy and to look to its future, as well as to bring the activities of the Society to the attention of government, research councils and top researchers.

Our guest speaker was Professor David Delpy, Chief Executive of the Engineering and Physical Sciences Research Council (EPSRC). He spoke of the speed of change, and managing the expectations of a public that believes that 3D real-time imaging at the atomic scale is now routine. He drew attention to the ground-breaking work of companies who

were represented at the reception such as Oxford Instruments and Aurox. He also acknowledged the work of the RMS in inspiring the next generation of microscopists through its Microscope Activity Kits, which include microscopes and teacher-developed curriculum-based resources for primary schools. More than three thousand children have already benefitted from their use. The kits have proved so popular that the Society is committed to funding an additional one hundred which will put a further one thousand microscopes into classrooms

The evening was a great success, with the strategic importance of the Society being widely recognised, providing a crucial role in bringing scientists together from both materials and life sciences backgrounds, giving scope for collaboration and a focus for research involving state of the art microscopy techniques via international conferences and the Journal of Microscopy. A report on the event was published in infocus in September 2013 and a video can be found at [www.rms.org.uk/events/special-events/houseofcommonsreception](http://www.rms.org.uk/events/special-events/houseofcommonsreception).



## Manchester Microscopy Congress 2014 (mmc2014)

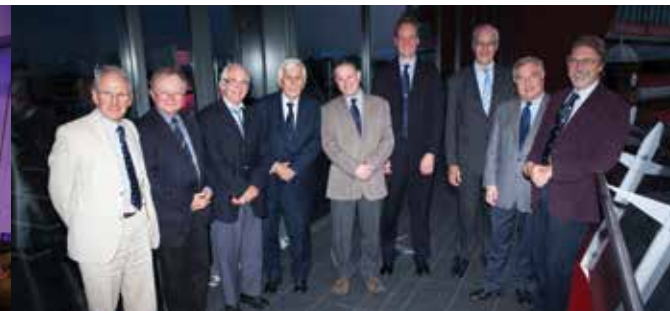
30 June – 3 July 2014

The 175th year also coincided with the first of the new series of mmc conferences that the Society has launched. Following on from the success of the European Microscopy Congress in 2012, mmc2014 was again held in Manchester. A programme of Plenary Speakers was arranged as part of the

conference all of whom received Honorary Fellowships during the event. Dr John Hutchison, a Past President of the RMS, gave an Anniversary Lecture about the history of the Society and the more recent developments in the 25 years since the 150th Anniversary in 1989. John has also put the last 25 years of the Society together as a book: 'Moving Forward' copies of which can be requested directly from the RMS by emailing [info@rms.org.uk](mailto:info@rms.org.uk).

Afterwards, the Congress & 175th Anniversary Banquet was held at Old Trafford Cricket Ground during which Past President Prof Bas Ploem gave a talk entitled 'The Early Days for Microscopy and for the Royal Microscopical Society'. We were very fortunate to have many of the Society's Past Presidents and Honorary Fellows with us to celebrate the occasion. As the evening wore on, the anniversary was celebrated in unconventional, yet memorable fashion with a spontaneous rendition of the Grease medley on the dance floor!

We have also used the 175th Anniversary as a reason to hold social gatherings at both the M&M conference in Hartford, Connecticut and the IMC conference in Prague. These events have provided an excellent opportunity to connect with those in the wider international microscopy community and to reconnect with some of our overseas members.



**175th Anniversary Meeting**  
**Microscopy: Advances,**  
**Innovation and Impact**  
**19 September 2014**

Finally, an event to mark the date of the anniversary was held at Glaziers Hall in London. Open to all members, this celebrated the award of Honorary Fellowships to two further eminent microscopists and outlined the latest developments in microscopy

in life sciences and materials science research. Our guest from BBSRC, Professor Melanie Welham complimented the role of the Society in bringing these two communities of microscopists together.

The event culminated in the launch of a video commissioned to showcase the role and activities of the Society and a drinks reception to allow for development of new collaborations. The video can be accessed here [www.rms.org.uk/VideoShowcase](http://www.rms.org.uk/VideoShowcase).



## Honorary Fellowships

In this Anniversary year we took the opportunity to mark the occasion by presenting a number of Honorary Fellowships. These were drawn from scientists who have developed microscopy or its applications in a substantial way over the last 25 years.

These were:

**Dr John Hutchison,** University of Oxford, UK



**Prof Helen Saibil FRS,** Birkbeck, University of London, UK

**Prof Anne Ridley,** King's College London, UK



**Prof Mildred Dresselhaus,** Massachusetts Institute of Technology, USA



**Dr Jennifer Lippincott-Schwartz,** National Institutes of Health, USA



**Prof Ondrej Krivanek,** Nion Co and Adjunct & Arizona State University, USA



**Prof Flemming Besenbacher,** Aarhus University, Denmark



**Prof Ernst Stelzer,** Buchmann Institute for Molecular Life Sciences, Germany



**Prof Michael Sheetz,** Columbia University, USA



**Dr Richard Paden,** Formerly of Camscan

**Prof Petra Schulle,** Max-Planck-Institute of Biochemistry, Germany

**Sir Colin Humphreys** CBE FEng FRS, University of Cambridge, UK

*Will be presented at mmc2015/EMAG 2015*

**Prof Leonard Herzenberg,** Stanford University, USA

*Sadly died before award could be presented*

We hope you will agree that the Society is going from strength to strength, and shows no sign of waning. We look forward to celebrating our 200th Anniversary in 2039!

**Dr Susan Anderson**  
**University of Nottingham**

**Prof Ploem** was invited to give an after dinner speech on the occasion of the 175th Anniversary of the Royal Microscopical Society, mainly because of his close relationship with the RMS as an Honorary Fellow and Past President. Detailed information about Prof Ploem's contributions to microscopy can be found in a website made in collaboration with the Dutch National Museum of the History of Science and Medicine [www.ploem-fluorescence-microscopy.com](http://www.ploem-fluorescence-microscopy.com).

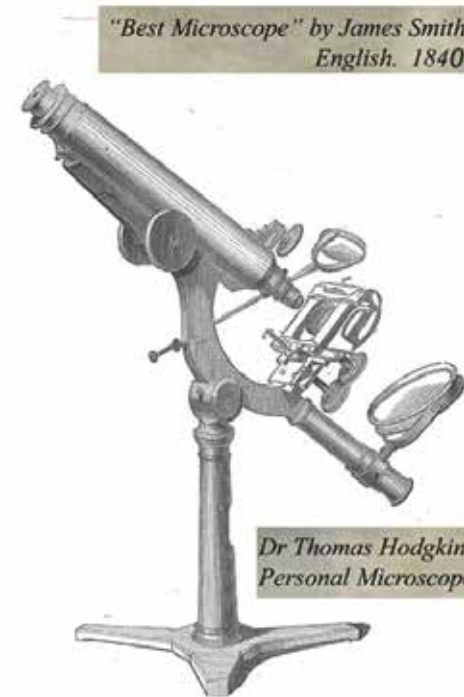
**Here follows an abridged version of his speech:**

I have a long relation with the Royal Microscopical Society. When I arrived as President of the RMS in their Oxford office I found a British Colonel Mr Fleming in control of a charming group. I was impressed by his knowledge and organisational capacities. I proposed to him to let the secretaries create a computer database of the entire RMS membership.

An early IBM personal computer was purchased. It had as an extra memory, a soft floppy disk with a colossal 1.6mb of memory. At that time Word

Perfect and Microsoft Word did not exist yet, but there was a complicated, word processing program called LEX. You can imagine the difficulties we had with a premature computer and a rough prototype word processing program. But a young RMS staff member Karen Collins performed wonders. She quietly accepted my program mistakes and with her energy she patiently worked until we finally succeeded in creating perhaps the first membership computer database for a royal society.

Karen Collins is today, as the Administrator of the RMS, a senior member of the team in Oxford and we are now celebrating the 175th Anniversary of the RMS.



To put this into context, let us imagine England at that time, citing some events in 1839:

- British forces seize Hong Kong.
- The bedchamber crisis - the Prime Minister asks Queen Victoria to dismiss her Ladies of the Bedchamber.
- The First Opium War begins in China.
- Charles Darwin was elected fellow of the Royal Society and married to Emma Wedgwood of bone china ware.
- The painter Turner exhibited his famous painting: The Fighting Temeraire

The unusually tall thin smoke stack depicted in Turners painting reminds us that we were in 1839 – still the early days of the English industrial revolution.

But two early members of the RMS, Thomas Hodgkin and Thomas Addison, were already far ahead of their time. Their work was so original and

important that their names survived an amazing 175 years until today, as Hodgkin's disease and Addison's disease.

In the decades before 1839 microscopes were still considered by some as toys for the rich landed gentry. But by around 1839 the scene changed. Joseph Lister, developed lenses with optical correction for chromatic and spherical aberration. Lister remained, however, fully engaged in his wine business and only worked on microscopy in his rare spare time. This is unfortunate, since from his publications one can conclude that he came very close to the later theoretical aspects of microscope optics as described by Ernst Abbe.

A James Smith microscope was one of the first microscopes bought by the RMS in 1839. Hodgkin bought a similar Smith microscope and became one of the first scientists to look with a microscope at specimens of diseased human tissue, a milestone in medical microscopy.

The European continent in 1839 was still far behind England in microscope developments. Around 30 years later a romantic photograph was made of an early primitive Zeiss workshop. It shows a master optician surrounded by a group of very young apprentices. They had little baskets full of small lenses and were assembling them into microscope objectives, using their intuition and practical experience to make objectives by trial and error. But this procedure was changed later by Ernst Abbe in Jena, when he used scientific algorithms to determine the construction of microscope objectives.

Robert Koch was a physician in a small town in Germany, who received an early Hartnack microscope as a present from his wife. Koch endeavoured to make bacteria more visible for microscopy by staining them with all sorts of dyes, but because bacteria are very small, the resolution was insufficient to clearly demonstrate them. He approached the Zeiss Company, who had, with the help of Ernst Abbe constructed an oil immersion

objective. This enabled Koch to make high resolution images of the tubercle bacillus. Another milestone in medical microscopy, opening the gate to the world of bacteria and corresponding diseases.

Another famous scientist who used microscopy in a surprising way, was Louis Pasteur. In an experiment he used a dissecting needle to painfully separate by hand the left and right small crystal shapes from each other under the microscope. He made two piles of crystals. When he put them in a solution, he then showed that one form rotated light to the left, the other to the right. He thus carried out a chemical experiment with a microscope. In 1856, Mr Bigot called upon Pasteur to help him overcome serious difficulties he was having with the French national hobby of manufacturing alcohol. Pasteur came into Bigot's factory, microscope in hand. In fluids from the alcohol fermentation process, he saw with his microscope two types of para tartrate crystals. One type was the mirror image the other. And with this work Pasteur launched the new science of stereochemistry.

I will conclude by reporting two curious, but significant events in my scientific career. Both have been published by other authors.

### I. An Early End to Flow Cytometry

When I was young assistant in the pathology department of Leiden University, I received one of the first flow cytometers in the world from the Phywe Company in Germany. It was for clinical testing.

My pathology professor at Leiden University, who considered medical technology as not needed for pathology, organised a committee of medical professors, and this committee decided unanimously that flow cytometry had no future! I sent my flow cytometer back to the Phywe Company.

### 2. A Significant Result of Extremely Rare Coincidence

Leitz invited a Prof Nairn from Australia to make the long journey from Australia to the small town of Wetzlar, Germany to see me about epi-fluorescence microscopy. In a big room at the Leitz factory, we compared a transmitted UV light fluorescence microscope (favoured by Prof Nairn) with an epi-fluorescence microscope (favoured by me!). The microscopic specimen to be examined using both microscopes contained some cells from the stomach of a rat, that were stained with green fluorescent FITC. I put a roundish cell of the specimen under my multi wavelength epi fluorescence illuminator and excited it in succession with ultraviolet, blue and violet light. To my surprise the fluorescence obtained with violet light excitation was reddish. With some hesitation, I said then to the audience that I thought it was not a stomach cell stained with FITC, but perhaps an alga cell. Accidentally the rat must have eaten food polluted with ditch water containing algae, and by extremely rare chance an alga cell had got into the microscopic specimen. This alga cell contained a type of chlorophyll that shows red fluorescence with violet excitation light.

The management at Leitz concluded that multi wavelength epi illumination offered new diagnostic possibilities in fluorescence microscopy and that Leitz would market fluorescence epi illumination microscopes. A celebration party started and champagne was flowing. Prof Nairn showed to be a good loser, and invited me for a visiting Professorship in Melbourne, we became good friends

Soon thereafter many other microscope manufacturers in the world followed Leitz by developing and marketing multi wavelength fluorescence epi illuminators.

# LED Illumination Covered

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Screening Fluorescence

- Instant on/off
- 0-100% intensity control
- Select from full range of LED wavelengths



### pE-300<sup>white</sup>

Regular Fluorescence

- Direct or light guide fit
- Broad spectrum
- Replaces mercury lamp



### pE-4000

Research Fluorescence

- 16 selectable LED wavelengths
- No modularity
- Compatible with all filters sets
- Broadest spectrum
- Brightest LEDs



### pE-100<sup>wht</sup>

Transmitted Applications

- 100W halogen replacement

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