The case of the disappearing microscope

Four years ago, one of the world’s most valuable scientific instruments just disappeared. Brian J Ford takes up the case, and he is hot on the trail...

Four years ago one of the fabulously important Leeuwenhoek microscopes came on sale in London, was bought by an undisclosed bidder, and hasn’t been seen since. Imagine if La Giaconda (the Mona Lisa), or the Wright Flyer from the Science Museum were bought and disappeared, or if Michelangelo’s Statue of David no longer looked out over the Palazzo della Signoria in Florence (well, in fact he doesn’t; he is residing in the Accademia out of the weather’s harm, and was replaced over a century ago with a replica, though you understand my point). This loss of our heritage is a loss to us all.

There are historical artefacts that define the modern world of science just as there are talismans in the world of art. The nine remaining microscopes said to be made by Leeuwenhoek around 1700 are a crucial component of the founding of science as now we know it, and only one has come on public sale for centuries. As reported in Laboratory News at the time (April 2009) it was purchased at Christie’s for £321,000 but, instead of being bought by a
leading museum to feature on public display, and being made available for serious scientific study, it was taken from the saleroom shortly after the auction ended, and then it simply vanished.

The microscope is typical of those made by Leeuwenhoek around 1690. It was found by Dr J J Willemsen of Rotterdam in a box of laboratory impedimenta he had bought from Leiden University in 1978. The sale in London took place before about 40 dealers, and I joined the bidding (not seriously wishing to buy it, but for the memory of being involved). Bids came slowly, and for a time it seemed that it would sell for less than £50,000. Internet bidders, and others on the phone, rekindled interest and the price soon mounted to £200,000. And then the bidding stopped. The auctioneer looked round the room, called in bids from the computer and phone operators, but silence was what he received and for some minutes it seemed that this record-breaking price would indeed be the final offer.

And then, after telephone instructions which I think came from the Deutsches Museum in Munich, the bidding resumed and climbed steadily to unexpected heights. As the hammer came down, the final bid for this tiny instrument had risen to £260,000 – and when the buyer’s premium and costs were added, the total was £321,237. This is over half a million dollars. The highest pre-sale estimate had been £100,000, and all for a silver of metal (with its tiny lens) that is overall no bigger than a souvenir postage stamp.

The winning bid had been placed by an antiquarian book dealer, W P Watson, as agents for a corporate purchaser who has never disclosed their identity. After I made repeated enquiries, Watson’s have been allowed to say only that it was acquired by a biotech company somewhere in the EU and at one time it was suggested that it might be put on display in an institute, but nothing further has been announced and the microscope has meanwhile disappeared.

This is an important scientific instrument, for Antony van Leeuwenhoek was the first person to study microorganisms with microscopes like this. Few people have believed that he could see as much as he claimed, and recent BBC documentaries have served only to confirm the scepticism. One of their programmes claimed to show how Leeuwenhoek had observed living sperm cells, and a demonstration was filmed using a replica microscope containing a small biconvex lens. An enthusiastic presenter named Adam Rutherford demonstrated his skill by exclaiming: “Look, there they are, thousands of little Adams swimming around!” Sadly, the reality did not match his hyperbole – nothing could be seen on the TV screen, other than a slightly speckled background.

It turned out that nobody had succeeded in making successful videomicrographs using single-lens systems. In previous years I had developed a range of techniques for visualising through single lens microscopes, and it was not hard to adapt those to video. A good friend at Cambridge ground some minute lenses for my experiments, and I used a specially-extended mechanical stage to act as a focussing assistant to align the camera with the lens and specimen. An LED was used, in place of a lamp, as an illuminator.

The results were spectacular. Some were announced in Laboratory News in December 2009 and attracted widespread interest – but what of living sperm cells? Using my single-lens array it proved possible to capture living sperm cells under similar technical conditions to those Leeuwenhoek had used. Instead of a mottled screen, in which no cells could be seen, it proved possible to film actively swimming sperm cells and vividly to recreate the view that Leeuwenhoek had obtained.

It is said that a young student named Ham brought the existence of sperm cells to Leeuwenhoek’s attention, observed in a specimen from a sufferer of gonorrhoea, so it is possible that the original specimen was actually of gonorrhoeal pus as much as semen. Leeuwenhoek wrote about his observation of sperm in a letter to Herman van Zoelen on 17 December 1698, and again to Lambert van Velthuysen on 13 June 1679. In August 1717 he had drawings of ram spermatozoa produced by his limner (Leeuwenhoek wrote that he had no talent for preparing sketches, so always had an artist make the drawings for him). These were sent in a letter to Herman Boerhave of Leyden, so it is fitting that the largest collection of Leeuwenhoek microscopes at the present day is in the Boerhave Museum in Leyden.

Like several of the surviving nine instruments that I have documented, the missing microscope was made of silver. It measures 39 mm x 22 mm and is fitted, as with other Leeuwenhoek microscopes, with a small stage that can be focussed and positioned by means of small screws. The lens, little bigger than the head of a pin, magnifies about 70x and has a resolution of 3μm – not enough to visualise staphylococci, but good enough for many microscopical specimens. Prior to the sale, a series of superb close-up photographs was taken by Christies’ scientific instrument specialist, James Hyslop. I am grateful to him for providing me with the images. At the time those pictures were an adjunct to my understanding, and a valuable resource for anyone who studies the work of Leeuwenhoek, that great microscopical pioneer. As the years have passed, the pictures have acquired a further significance – they are the only reminder that we currently have of a uniquely important scientific instrument that has otherwise vanished without trace.