A Process of Ventriloquism? James Watt's Micrometer

Ben Russell

A significant item among the Science Museum's holdings pertaining to the Scottish engineer James Watt is a micrometer, alleged to have been constructed by him c.1776.[1] It has been described as possibly the first micrometer used for industrial purposes, and it came to the museum in 1876, when it was placed on loan by James Watt & Co. for display at the Special Loan Exhibition held that year (Fig. 1).

This paper will describe the instrument, and its known history, with reference to the locations which are in theory associated with the micrometer. Most recent first, these are the Science Museum in South Kensington, the 1876 Special Loan Exhibition also held in South Kensington, the Watt Museum operated by James Watt & Co at Soho, Birmingham, and Watt's workshop from his home 'Heathfield', at Handsworth just outside Birmingham. The nature of the association between the instrument and each location differs. The workshop provides artefacts against which the instrument can be compared. The other three contextualise the micrometer as part of the myth-making around Watt as a heroic nineteenth century figure. This paper's opening gambit is to suggest that each of these locations provides a step in what can be described as a process of 'ventriloquism' around the instrument. This term was coined by Tom Ritchie in his PhD thesis about Douglas Hartree's Differential Analyser, which I helped to supervise.[2] In the thesis, Tom explored how description and interpretation of that machine subtly changed over time during its life in the museum, to describe something that the object ultimately wasn't. The question this paper explores is whether we can see a similar process of ventriloquism occurring with Watt's micrometer.

To briefly describe the instrument: It comprises a shaped brass plate carrying a stationary anvil at the outboard end, and a sliding anvil threaded to a leadscrew beneath. Both anvils are wrought iron, and the maximum distance between the two is once inch. A small dial is driven by a gearwheel meshing with the leadscrew, and indicates the number of complete turns made by a second, larger dial, mounted axially to the leadscrew, with each revolution divided into 100 parts. In theory, the instrument has been claimed to be accurate to within 1/1900", though this point will be returned to below.[3]

Regarding the history of the instrument at the Science Museum, it is unusual that, though claimed to have been the personal possession of Watt, or made by him, it was not acquired by the museum from Watt's descendants like his workshop, the main concentration of Watt's personal possessions.[4] It was instead presented to the South Kensington Museum in 1876 by James Watt & Co., the firm founded by Watt with Matthew Boulton, which thereafter closed down in 1895.

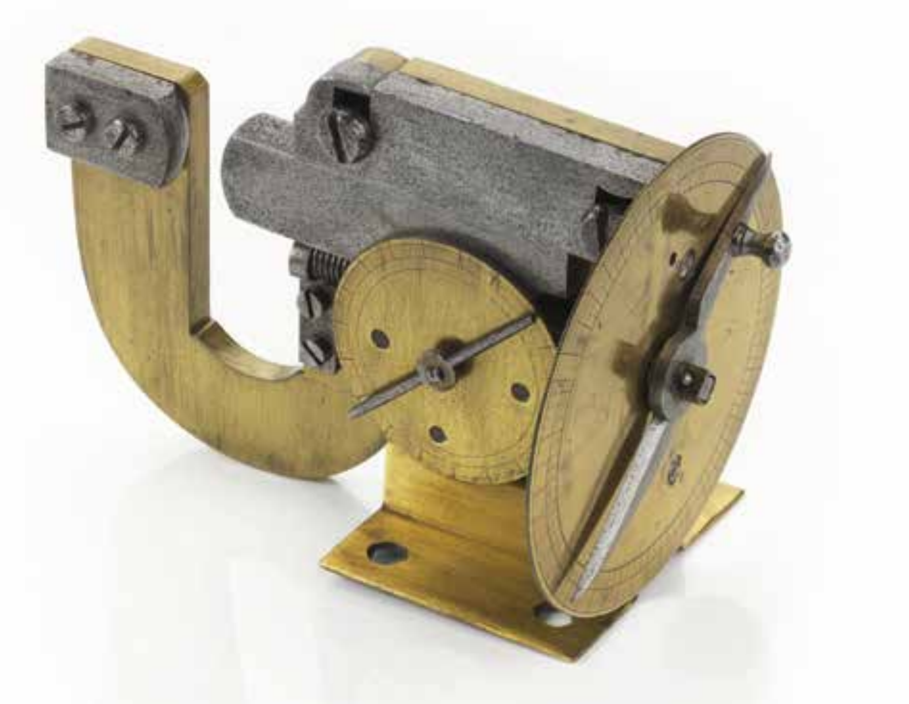

Fig.1 *The alleged Watt micrometer. A workpiece is placed between the two iron anvils at top left, and the longer of the two is brought into contact by advancing it using a leadscrew beneath – see Fig. 5. The measurement is read off the small dial on the instrument's front, and then the larger dial on its right-hand end. Science Museum, inv. no. 1876-1370.*

The instrument has been variously described in museum labels found in the object's technical file, and in different published museum catalogues. Early versions state 'Model of an end measuring instrument, by James Watt' and 'Model, by James Watt, of a measuring instrument'. Later this became 'Watt's micrometer, late 18th century. This is a micrometer end-measuring instrument believed to have been made by James Watt. If so, its date must be about 1772.'[5] The use of 'model' is interesting, and then it deletion and the addition of a tentative date.

While in the museum, the instrument has also been described in several other publications. H.W. Dickinson's 1927 classic *James Watt and the Steam Engine*, notes how the design of the instrument is so compact 'one would say it was of a later production', and 'it is in nearly all essentials the micrometer of today'. Ken Hume's 1980 *History of Engineering Metrology* mentions it too, stating:

> 'Watt made a screw micrometer, probably the first ever, in 1772… It may appear to be a rather crude instrument, particularly when one considers that Watt had been an instrument maker, but he no doubt had in mind the treatment it would get at the hands of his engine builders.'

Hume's statement is problematic in a number of ways, not the least of which being that Watt's erectors would have had little, if any, use for a one inch micrometer capable of measuring to 1/1900". This was, after all, a machine which was often unloaded at the site that it was to be erected at by the simple expedient of tipping the entire wagon onto its side.[6] In terms of the parameters of accuracy which it was constructed within, these were broadly measured in terms of 'the thickness of an old shilling', for example – although the boring of the engine's cylinder using plant designed by ironmaster John Wilkinson was remarked on as an early example of high precision in machine manufacture.[7] Most recently, Richard Hills, in his survey of Watt's life and projects, noted about the micrometer, 'The date of construction is unknown but it is an early example of such a tool.'[8]

The micrometer's museum labels are a little perfunctory and changeable, and other sources raise further doubts about it. All of this contributes to a sense of hesitation in attributing a definite provenance to the micrometer. This sense is reinforced when considering the next location associated with the instrument – the Special Loan Exhibition of 1876.

The Loan Exhibition presented a collection of 20,000 scientific instruments; from across the museums of Europe. In the Exhibition catalogue, the micrometer formed part of an object group entitled 'Collection of the Original Models of Steam Engines and Other Machines of James Watt', presented to the South Kensington Museum by 'Messrs J Watt and Co'.[9] The instrument was described as '1928z. Measuring Apparatus, with Micrometer Screw, for taking end measures.[10] It was separate from the main body of 'Gauges and Callipers' presented at the exhibition, suggesting that it was acquired because of its associations with Watt more than anything else.[11]

This was a period when the micrometer as a piece of metrology was gaining favour. J.L. Palmer had introduced his 'screw calliper' in 1848; Joseph Brown and Lucian Sharpe saw Palmer's calliper on display at the Paris International Exposition of 1867, and were producing their own form of it in the shape of a pocket sheet metal gauge in 1869, for sale in anglophone countries; their 1877 catalogue described it as a 'micrometer caliper'.[12] Gustav Horstmann had also in 1856 developed a special purpose micrometer to measure pivot diameters for clocks and watches, designed to be accurate to 0.0001".[13]

Of particular significance in 1876, however, would have been Joseph Whitworth's system of what he described as 'end measure', which was starting to come into general use as an alternative to the tried-and-tested pairing of rule and calliper. Here was the difference between measurement by sight, and by feel.[14] To reiterate, the Loan Exhibition catalogue described the Watt micrometer as being for taking 'end measures'. Whitworth opens his 1876 paper 'On Linear Measurement', 'The two great elements in mechanics are the power of measurement, and the true plane'.[15] Thereafter, however, he refers to 'measurement' as the process of measuring, and 'measures of length', 'line-measure' and 'end-measure' as quantities generated by the measuring process.

The similarity of phrase, with both Whitworth and the label using 'end measure', is interesting – particularly if, as Robert Bud has described, the 1876 catalogue entries were written by the lenders.[16] If James Watt & Co. wrote the label, there are two possibilities. First, the company were simply reflecting in the description best-practice technique then coming into use, and this was repeated in subsequent labels. The second possibility is that this was a subtle attempt to appropriate for Watt at this significant exhibition some credit for the improvements being wrought by Whitworth.

Fig. 2. *James Watt's workshop in situ at Heathfield, Birmingham, just prior to being decanted to the Science Museum, 1924.*

This leads to consideration of the next location, the 'Watt Museum' located on the premises of the instrument's lender to the 1876 exhibition – James Watt & Co., initially based at the Soho Foundry in Birmingham. Tangye Brothers purchased the Soho Foundry when James Watt & Co. closed in 1895. They then established at their Cornwall Works a 'Watt Museum', containing the objects and archival material. This was then presented to Birmingham Central Library in 1911, forming the contents of their 'Boulton & Watt Room'.[17]

Birmingham's Archives of Soho contains two content lists for the 'Watt Room' established at the Soho Foundry, which was the premier collection of Watt-related artefacts before the Science Museum began building its own collection.[18] One of the lists is definitely, and the other tentatively, dated 1895. There are also two sets of photographs, again of the 'Watt Room', and one is dated 22 February 1910 – by which time the Watt material had been transferred to new premises at the Cornwall Works. None of these mention the micrometer, which is entirely expected, as they postdate its coming to South Kensington in 1876. It also means that there is nothing to confirm that the instrument was definitely at Soho before 1876. This is curious, given the micrometer's stated significance.

Recently, David Miller has investigated the detailed provenance of a steam engine indicator alleged to have been the personal property of James Watt, and inscribed with the year 1785, also in the Watt museum at Soho, where it can be identified in photographs.[19] He shows that possibly James Watt Jnr prior to 1848 or, Mr Wollaston Blake, or even more likely W.H. Darlington - the former a partner in the firm since 1841 and its sole owner by the time it finally closed down in 1895, the latter the general manager with particular responsibility for the 'Watt Room' - created it 'out of the materials of company folklore'.[20] Miller further suggests one of Darlington's employees could have added an inscription to the indicator between the 1840s and 1880s, 'either as a deliberate deceit or as a result of hazy Company tradition'.[21] Miller concludes that 'many engineers in the late nineteenth and early twentieth centuries would have been persuadable that the 1785 indicator was genuinely Watt's original instrument'.[22]

Regarding the 'Watt Room' at Soho, then, there is not only no paper trail documenting the micrometer's existence, but we even have a precedent for another object being claimed to be Watt's personal property when it quite possibly wasn't. This brings us to the final location with conceivable connections to the micrometer – Watt's workshop (Fig. 2).

The workshop was Watt's personal workroom, converted from what was originally a storage room in the attic of his home, Heathfield, which Watt had built in the 1790s. Watt spent much time in the workshop up to his death in 1819, and thereafter the workshop was left largely untouched until 1924, when

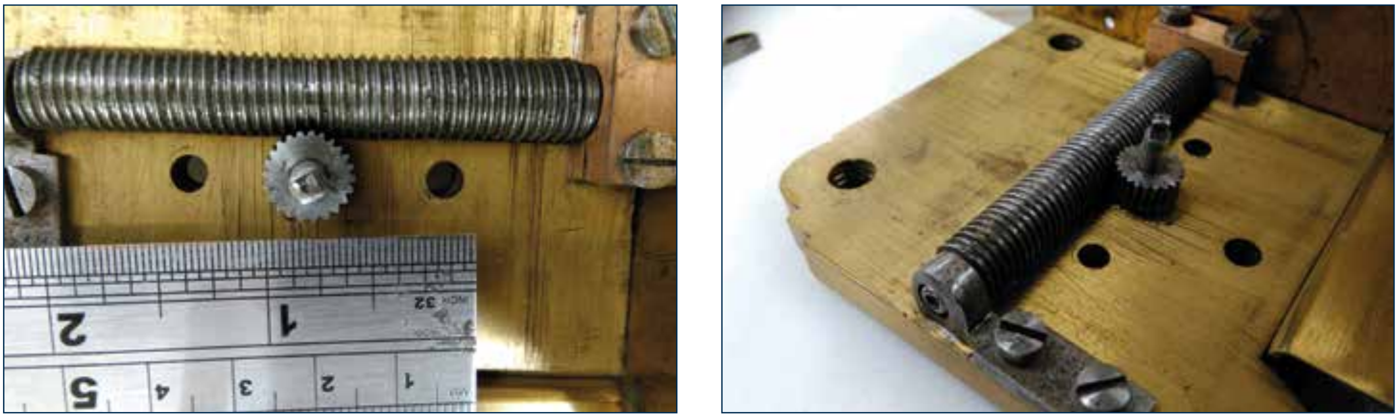

Fig. 3 (a) and (b) *Two views of the lead screw from micrometer, inv. no. 1876-1370, which also clearly shows the small gear wheel which rotates the small dial.*

Heathfield was proposed for demolition, and the surrounding estate given over for house-building. That year, the workshop was given to the Science Museum by his family in its entirety.[23] It contains an immense range of material, relatively litle of it to do with the steam engines for which Watt is best known, but primarily documenting his projects in a wide range of other areas, from chemistry to sculpture and sculpture copying, musical- and scientific instrument-making. It is sometimes possible to identify connections between Watt's surviving correspondence and particular items in the workshop, as will be done now with his work on micrometers. This also presents an opportunity to move from appraising the locations associated with the micrometer, to studying the instrument itself.[24]

Watt's letters contains at least three micrometer references between 1767 and 1773. He wrote to an un-named correspondent on 9 September 1767: 'It gives me great pleasure when I can communicate even a new trifle to my friends. With this view, I send the description of a micrometer I think new...'.[25] More letters followed; Watt wrote to William Small on 24 November 1772, about a new lead screw having 38 threads per inch: 'it has a wheel fixed upon it with 150 teeth and only ¼ inch diameter. It is moved any portion of a turn or number of turns by a straight line rack, the teeth of which fit it without shake, & is moved by the hand or foot. It divides distinctly an inch into 400 equal parts.'[26] He continued work in 1773, writing to Small again on 7 March that 'My dividing screw can divide an inch into 1000 tolerably equal and distinct parts on glass'.[27]

The micrometer's main lead screw (Fig. 3 a and b) is central to the instrument's effectiveness, and was examined under a microscope. It is 3/8" diameter, and the thread is $2^5/_8$" long, supported at the measuring loop end by a small iron bracket and two screws into the instrument's brass frame, and behind the large dial by a two-part bearing with two screws again going into the main instrument frame. Careful checking along its entire length revealed that it has 17.5 threads per inch. The thread has a relatively well defined profile; the thread crest and gully are bright (although the flanks are generally not), and there is a lot of damage. The thread is also quite deep in relation to its pitch, and the ends have centres marked (one more prominently than the other), suggesting that the thread was turned. In conjunction with the larger dial plate, the thread allows the instrument to measure to 1/1750".

The lead screw was compared to two others present in Watt's workshop, which were also studied with a microscope. One of these comes from an 'instrument for dividing scales' which appears to be that referred to by Watt in his letters to William Small, referred to above.[28] This has a thread of 9½" length and external diameter of ¼", forming a pronounced sine wave rather than a more square section thread profile. Checking along the considerable length

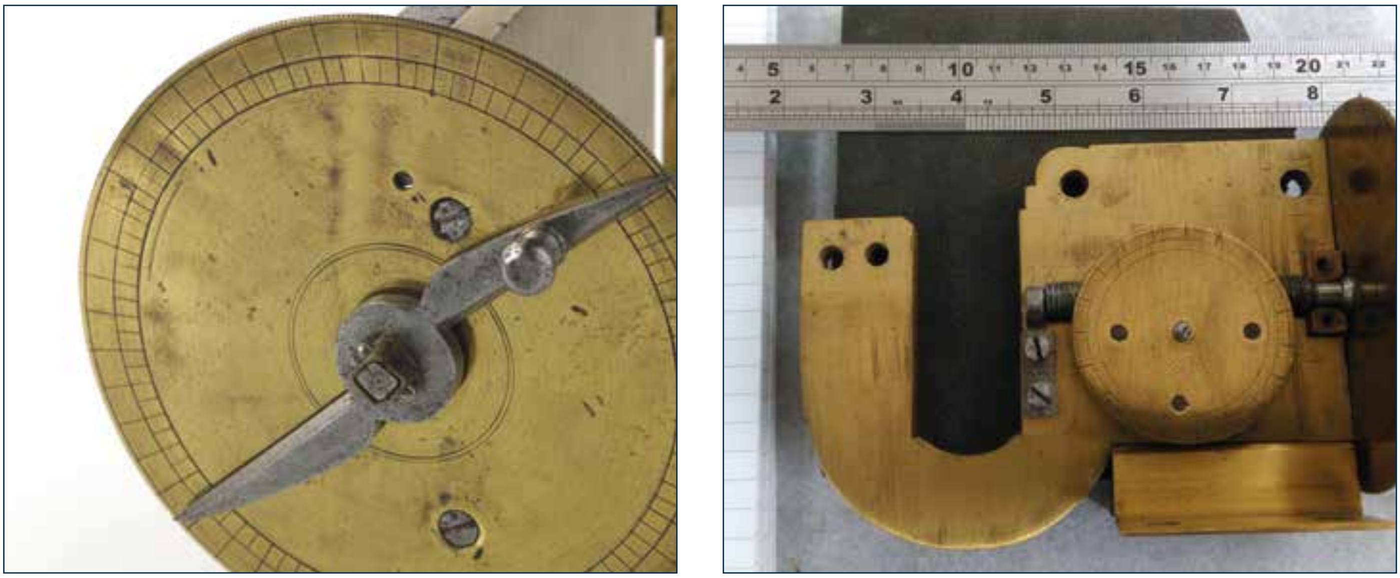

Fig.4 (a) *The large dial from the same micrometer and* (b*) the top view of the small dial which is also shown quite clearly in Fig. 1.*

Fig. 5 *The bottom of the micrometer's moveable anvil, showing the interface with the leadscrew beneath. As the leadscrew rotates, it moves the anvil along the axis of rotation. Science Museum inv. no. 1876-1370.*

Fig. 6 *The rear of the small dial, showing marks.*

of the screw reveals a remarkably consistent 27½ threads per inch. The second is a long steel screw with a tapered square head at one end, which could be held in a chuck, vice or wrench while making the thread; it is attached to a square brass block, to which is mounted a steel spring.[29] This appears similar to the feed arrangement on the equal-size sculpture copying machine present in Watt's workshop.[30] The screw is of the same diameter and pitch as that of the linear dividing engine, suggesting that they were made by the same hand. If the lead screw for the linear dividing engine is dated 1772-1774, and that associated with the sculpture copying machine is approximately 1809[31], this shows a remarkable degree of continuity – and, importantly, neither is a match for the lead screw in the micrometer.

There again, to add another layer of complexity, the micrometer lead screw also do not match the later nineteenth century standards, including Whitworth.

The lead screw drives two dials. The smaller of the two is driven by a small gear wheel meshing with the leadscrew, and serves as a revolution counter, up to a maximum of 19 rotations – this seems at odds with the 17.5 threads per inch on the lead screw. The larger dial plate, of 3¾" diameter (Figs 4 a and b), is first divided into 50, and then each division is split in two, giving 100 divisions in total. The instrument's calibration was tested by the Science Museum *c*.1959, based on notes in its technical file.[32] A series of Johannsen gauge blocks ranging in size from 0.1" to 1.0" at 0.1" increments were placed between the measuring anvils; the reading from the gauges was noted and converted into a decimal equivalent. These suggested an error of up to 0.012". However, carrying these tests out with any degree of certainty must have been extremely difficult given the amount of play in the instrument's components. For example, the rotation of the pointer on the small dial is intermittent, and in practice a single division on the rev counter records up to one and a quarter turns on the larger dial. The pointer for the large dial is sufficiently loose that it can rotate around its axle by approximately 3/1750" on either side of a given point. A subsequent curator, Ken Corry, noted on the tabulated calibration test results in April 1984, 'Very suspect results'.

In summary, the instrument's calibration is highly problematic. Neither of the dials are marked with any numbers. The leadscrew thread of 17.5 threads per inch equates to a pitch of 0.0571", so each of the one hundred divisions on the large dial represents 0.00057" – a resolutely unhelpful number. It also sits uncomfortably with the small dial's division into 19.[33] This may not have been important: there was no standard inch for it to be compared to in absolute terms. What may have mattered more was if it was being used for comparison between numerous workpieces and a gauge, and comparisons could be repeated using the same units of measurements, exactly what that unit was mattering less. This highlights the importance of knowing what the instrument was used for, which remains uncertain.

Whatever the instrument was measuring would have been placed between the two measuring anvils. These are made of wrought iron and have rounded ends, offering the possibility of measurements varying depending on where between the two the workpiece is placed. The moveable anvil is dovetailed to fit against a similarly dovetailed guide above, and its bottom surface (Fig. 5) engages along its entire length with the lead screw beneath: the threads cut to engage with it do not run true, but at an angle along its length. The outcome of this construction is that as the instrument's dial pointers exhibit excessive play, so the movement of the measuring anvil is difficult due to excessive friction. A large portion of the lead screw is in contact with the moveable anvil above, and that in turn is sandwiched from above by the dovetailed guide, which is also in close and extensive contact as the anvil is wound back and forth. This was found to only be reduceable to a certain extent by slackening off the neck bearing holding the lead screw in place behind the large dial plate.

Overall, the instrument's construction suggests a want of attention, some hastiness, and the re-use of materials. The main brass plate has many hammer marks. The dividing on the large dial frequently overlaps the circumferential lines, and the rear side has a number of circumferential markings as if it has been used as a test piece for other work. The rear of the small dial also has very heavy file marks (Fig. 6). The outer edges of both have been knurled, which seems unusual – perhaps it was a chance to practice the knurling process. The upper guide for the moving anvil appears to have been gripped hard between the jaws of a vice. The anvil itself has a cut-out at its bottom right hand corner, to avoid it hitting the bracket supporting the large dial. It is also not square: when it is laid on a plane surface, it rests on its bottom corners. Finally, the mounting bracket for the instrument doesn't give enough clearance to allow it to sit flat and square – when laid down, it rests on the brass loop of the main body.

Binding screws used in the micrometer were withdrawn and the diameter, thread form and number of threads per inch noted, for comparison with those used in the linear dividing apparatus from Watt's workshop.

It appears that the binding screws in these two instruments do not match (Table 1).

Table 1. Screw measurements

1876-1370, micrometer	
Location	**Screw measurements**
Outboard anvil	22 Threads per inch (TPI), pitch 3/64”, ¼” external diameter. A very rounded thread
Upper guide for moveable anvil	16TPI, 1/16” pitch, 5/16” external diameter. Squarer profile
Bracket for lead screw	26TPI, 1/32” pitch - the discrepancy is most likely caused by the screws being short – it was only possible to examine ¼” of thread – the pitch is more accurate), 3/16” external diameter.

1924-792/2008, linear dividing apparatus	
Location	**Screw measurements**
Retaining centre screw for main dividing lead screw	3/8” external diameter, 16 TPI. A sine wave profile
Securing frame for ratchet wheel in place	1/8” external diameter, 40TPI.

X-ray fluorescence tests were carried out to analyse the composition of the metals present in the instrument, in comparison to a those in a small number of objects selected in Watt’s workshop. Only the main elements present are detailed below, for brevity (Table 2).

The brass composition seems fairly consistent with that for pre-twentieth century instruments, with relatively low zinc content and relatively high heavy metal impurities – lead, primarily. There were no impurities present in items from the workshop but not present in the micrometer. However, given that brass from *c.*1876 would not be very different from that made a century earlier, this is not conclusive proof that the micrometer can be dated to 1776 – as Dr Joshua Nall suggested to me in interpreting these results, we can only be more confident that it *could* be.[34]

Conclusion

To conclude, perhaps rather inconclusively: the start of this paper proposed that the micrometer might have undergone a process of ventriloquism, with its meanings subtly changing over time. Some aspects of the instrument – its rather rough-and-ready construction, with much friction, alterations and work-marks, tallies with other evidence from his workshop that Watt could be an indifferent workman – his dividing plate with 359 teeth, for example, the result of cumulative error during its manufacture.[35] But, Watt did not have a monopoly on bad workmanship, and there are no direct similarities to other items from Watt’s workshop – particularly the lead screws examined. In the absence of clear physical evidence, and even an intended use, we turn to Watt’s written accounts and, again, there are no documentary sources describing the micrometer. Richard Hills states that Watt used the word ‘micrometer’ to describe a *range* of ‘measuring and sighting instruments’, taking in both surveying and astronomical aspects of the term, not just its use in engineering metrology.[36] In metallurgical terms, the instrument *could* be eighteenth century, but there is no paper trail to provide confirmation – and given the sheer depth and breadth of Watt’s surviving papers at the Archives of Soho, this seems most pertinent of all. It is tempting to suggest that the micrometer’s history is actually less subtle, and much more binary, than suggested at the start of this study: it almost springs into existence in or shortly before 1876. Was it, to return to David Miller’s phrase, created by someone in the firm of James Watt & Co. ‘out of the materials of company folklore’? Here is an object which, for all its interest, I think we must treat with some suspicion.

Notes and References

1. Science Museum inv. no. 1876-1370.

2. Thomas Ritchie, *Object Identity: Deconstructing the ‘Hartree Differential Analyser’ and Reconstructing a Meccano Analogue Computer*. Doctor of Philosophy (PhD) thesis, University of Kent, 2019.

3. More information can be found in the micrometer’s technical files, Science Museum reference T/1876-1370.

4. Watt’s complete workshop from his house, Heathfield, preserved essentially as it was upon Watt’s death in 1819, and acquired in its entirety in 1924. Science Museum inv. no. 1924-792.

5. It is quite difficult to date the labels accurately. This sequence derives from looking at the typeface used and the condition of the paper the label was printed on. Science Museum object technical file, T/1876-1370.

6. H.W. Dickinson and R. Jenkins, *James Watt and the Steam Engine*, 2nd edition (London, 1989), p. 261.

7. John Farey, *A Treatise on the Steam Engine, Historical, Practical, and Descriptive* Vol. 1 (1827, reprinted London: David & Charles, 1971), p. 328.

8. Richard Hills, *James Watt Volume 1: His time in Scotland, 1736*-1774 (Landmark,

Table 2. X-ray fluorescence

Object details	**Copper %**	**Zinc %**	**Tin %**	**Lead %**
1876-1370 micrometer, large dial plate, brass	67.556	28.959	0.03	3.259
1876-1370 micrometer, main instrument plate, brass	68.465	26.925	0.248	4.017
1924-792/1086, brass sector, unseparated	65.116	31.870	0.043	2.55
1924-792/308, long fine leading-screw; brass star-shaped thumb screw	74.7	19.437	1.229	4.043
1924-792/2008, apparatus for dividing scales, brass bracket for circular ratchet	66.919	25.635	0.537	6.203
1924-792/2008, apparatus for dividing scales, brass bearing	71.846	20.895	0.671	5.439
1924-792/15, 1 long steel screw in square brass block with flat steel spring attached; nut, brass	73.62	22.403	0.156	2.759
Unfinished quadrant 1924-792/1775, front of pivot	77.136	1.637	11.592	8.898
Unfinished quadrant 1924-792/1775, brass mounting socket	72.002	22.524	0.87	4.021

2002), p. 132.

9. *Catalogue of the Special Loan Collection of Scientific Apparatus at the South Kensington Museum* (Third Edition, London, HMSO, 1877), p. 447.

10. Ibid., p. 449.

11. Ibid., pp. 56-63.

12. Ken Hume, *A History of Engineering Metrology* (Published by Mechanical Engineering Publications for the Institution of Mechanical Engineers, 1980) p. 146.

13. Science Museum inv. no. 1938-312.

14. Norman Atkinson, *Sir Joseph Whitworth: ‘The World’s Best Mechanician’* (Stroud: Sutton, 1997), p. 93.

15. Sir Joseph Whitworth, ‘On Linear Measurement’, *Conferences held in connection with the special loan collection of scientific apparatus, 1876. Physics and mechanics.* (London: Chapman and Hall, 1877), p. 216.

16. Information provided by Robert Bud, 5 July 2019. Robert wrote: ‘the Germans put in price and commercial advertising in their labels. This had to be removed and the Germans then set up a special room which acted as a salesroom’. I am very grateful to Robert for his help on this interesting point.

17. See Lawrence Ince, ‘The Soho Engine Works 1796–1895’, *Stationary Power: The Journal of the International Stationary Steam Engine Society* **16**, (2000), pp. 101-102.

18. I am grateful to Fiona Tait for her help identifying the lists.

19. David Philip Miller, ‘The Mysterious Case of James Watt’s ‘“1785” Steam Indicator’: Forgery or Folklore in the History of an Instrument?’, *The International Journal for the History of Engineering & Technology*, **81**:1 (2011), pp. 129-150.

20. Ibid., p. 146.

21. Ibid., p. 141.

22. Ibid., p. 145.

23. For an introduction to the workshop, see my *James Watt: Making the World Anew* (London: Reaktion in association with the Science Museum, 2014), and David Miller, *The Life and Legend of James Watt: Collaboration, Natural Philosophy, and the Improvement of the Steam Engine* (University of Pittsburgh Press, 2019), pp. 277-283.

24. I examined the instrument in detail with Will Francis, who has an excellent video about it at https://www.youtube.com/watch?v=1K_NQlmOwqM. I am very grateful to Will for his comments on the instrument.

25. James Watt letter to an unnamed correspondent, 9 September 1767, James Watt papers, Archives of Soho, JWP: C1/14.

26. Richard Hills, *James Watt Volume 1* (see note 8), p. 132.

27. Ibid., p. 38.

28. Science Museum inv. no. 1924-792/2008. It appears to have been modified during its working life, and presently has a dividing wheel divided into 240 parts on it. This correlates with Watt’s further description of the machine to Small in February 1774 – see Richard Hills, *James Watt Volume 1: His time in Scotland, 1736*-1774, p. 133.

29. Science Museum inv. no. 1924-792/15.

30. Science Museum inv. no. 1924-792/1924. I am grateful to Michael Wright for this observation.

31. H.W. Dickinson, *The Garret Workshop of James Watt*, Science Museum. Technical Pamphlet, No. 1 (London, HMSO, 1929) , pp. 14-15.

32. Science Museum reference T/1876-1370.

33. Although there may be nothing wrong with the latter in itself. It may be coincidence, but Watt’s linear dividing engine had a leadscrew of 38 threads per inch, 19 multiplied by two. Thanks to John Ditchfield for pointing this interesting correlation out.

34. I am grateful to Josh Nash of the Whipple Museum, Cambridge, for his expert help interpreting the materials analysis.

35. Science Museum inv. no. 1924-792/1814.

36. Richard Hills, *James Watt Volume 1* (note 8), p. 132.

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‘Fireside Chats’

Inspired by our Chair, Charles Miller, we have created a series of members-only monthly informal talks to provide an ideal opportunity for us to keep in touch virtually, despite the lack of tours and in-person events for the foreseeable future. We’ve had a great response so far with around 40 attendees at each Zoom from across Europe and North America.

We have speakers signed up until May. Then we’ll break for the summer (apart from the AGM on 12 June, see flyer for details). We’ll resume again in September and would be delighted to hear from you either to suggest a talk (perhaps to share a 25-minute presentation on a topic or instrument of your choice), or perhaps to give a live ‘show and tell’ video tour of your collection? We’re open to suggestions and warmly welcome members to submit their ideas via events.sis.uk@gmail.com/

Talks will be recorded (subject to speaker consent – no obligation). These videos will be available online via the Members’ Section so you can watch these talks at a more convenient time (or even again!) – please keep checking the website for details.

Reports of the First Two ‘Chats’: Saturday 12th December 2020

‘The Aphengescope Lantern Apparatus’ by Mark Bailey, Independent Scholar

Our series began with an unusual piece of magic lantern apparatus, the Aphengescope, which projected magnified reflections of pictorial ephemera such as postage stamps on a screen. Mark, a Fellow of the Royal Philatelic Society of London, described how W.B. Avery (1854–1908), whose family amassed a fortune manufacturing weighing scales and measures, assembled a world-class stamp collection. He and others adapted the Aphengescope for different purposes, both within philately and beyond, especially within educational institutions. There followed a lively discussion on how members had used this type of projection apparatus during the mid-twentieth century.

Saturday 16th January 2021

‘*Following in the footsteps of the 13th-15th century instrument makers’* by Dr Taha Arslan, Assistant Professor, Dept of the History of Science, Istanbul Medeniyet Universitesi

Taha gave us a fascinating tour of the world of Islamic instruments, describing how he uses instruments as ‘witnesses’ to the history of astronomy, mathematics and craftsmanship. He explained how instruments were created at different scales for specific purposes, from large scale high precision instruments used at state-funded observatories for providing calendrical data, to small, portable and easy to use items, such as the sinical quadrant, developed by Islamic timekeeping scholars (‘muwaqqit’) who only need precision to the nearest minute. Taha explained how we can use surviving manuscripts and instruments to gain an insight into the complete production process, from mathematical theory and astronomical data through to the selection of materials and use of craft techniques. In the final part of his talk, Taha explained how he meticulously makes replica astrolabes from laser-cut brass – even including mistakes found within the originals – before finishing off the details by hand and adding his own signature. We will follow his progress with interest.

Louise Devoy
Events Officer, events.sis.uk@gmail.com