UK museum holdings of historical ultrasound equipment

Dear Editor,

The history of the early development of medical ultrasound has been extremely well documented, and some of those who were involved with the very earliest developments are still able to share their recollections of manual scanners with thermionic valve electronics, generating low-resolution images recorded on Polaroid film. Most of these space-occupying scanners were scrapped before the end of the 20th century to make way for their much smaller real-time successors, which were introduced from the 1970s onwards. A very few were stored, far-sighted users understanding that they were part of our national heritage. The purpose of this letter is to record the existence, location and present custodianship of a number of the earliest ultrasound scanners that were designed and built in the UK and are accessible in national museums (see Table 1). Two mechanically scanned systems have been included because they form a natural part of this group.

Although largely hidden from public view, all may be inspected by arrangement. The only two scanners in public museums are in Scotland, one in Glasgow and the other in Edinburgh. The Hunterian Museum in Glasgow University has on display the first-ever contact ultrasound scanner designed and built by Mr Tom Brown and used by Professor Ian Donald and Dr John MacVicar in the Western Infirmary, Glasgow. Due to limited display space, the electronic units are displayed rather oddly under the scanning gantry where the patient would have been. In Edinburgh, the National Museum for Scotland has a Nuclear Enterprises NE4200 Dasonograph c. 1980 from Newcastle in an excellent display.

You have to try a bit harder to inspect any of the remaining scanners. Three may be found in the real-time equipment store of the Glasgow Museums Resource Centre (GMRC). I am extremely grateful to Mr John Fleming, former curator of the BMUS Historical Collection (www.bmus.org/about-bmus/historical-collection), for arranging and joining me on

a visit there recently. The GMRC holds three scanners, all with strong connections to Brown, Donald and MacVicar, pioneers remembered by BMUS in the annual eponymous lecture. The oldest is the Automatic Scanner from 1960. The next in age is a Smiths Dasonograph (also known as NE4101) from 1964. The third, dated 1973, is a multiplanar three-dimensional (3D) scanner. It is the result of Brown's work at Sonicaid to realise his long held contention that the user should be presented with a true 3D image, in this case a stereo pair.

Three items are held by the Science Museum in London. I was fortunate to visit their store at Blythe House, Olympia with a group from the British Society for the History of Radiology earlier this year, where the custodian, Katie Dabin, showed us their holding of medical imaging equipment. This is almost exclusively radiological; of the 890 items recorded on their inventory, only six are related to medical ultrasound; three items are listed in Table 1. The oldest is the NE4101 used and donated by Professor Stuart Campbell and supplied to Queen Charlotte's Hospital in about 1968. The youngest, a NE42005, from Hillingdon Hospital London, is held in the Science Museum Large Equipment Store at Wroughton Airfield outside Swindon. This is the most difficult to access, the store being largely closed to the public at present. Finally listed in Table 1 is the only item of ultrasound equipment on public display by the Science Museum, an Emisonic 4264 rotating transducer scan head for real-time scanning c. 1989.

For the record, I should note the other three items held in the radiology store in Blythe House. One of these is a Henry Hughes Supersonic Flaw detector Mk2B donated by the Institute of Cancer Research. It has strong historical interest, being an instrument of the same type, or even the one, that was loaned to Ian Donald and used by him for his first experiments into ultrasound and was the 'spark' that ignited the collaboration of Donald and Brown. The others are both real-time scanners, a Siemens Vidoson water-bath scanner c. 1974 and a Toshiba SAL-38B with a linear array from the mid 1980s. The BMUS Historical Collection in Glasgow also includes a Vidoson.

Table 1. Archived scanners from the Disonograph series and their locations in the UK

Date (approx.)	Location	Equipment	Origin	Manufacturer
c. 1957	Hunterian Museum Glasgow on loan from GMRC	The first contact scanner	Western Infirmary, Glasgow	Operational proto- type (The Bedtable Scanner)
c. 1960	Glasgow Museums Resource Centre	The first automatic contact scanner	Western Infirmary, Glasgow	Operational prototype
c. 1965	Science Museum Store, Blythe House	NE4101/ Disonograph	Queen Charlotte's Hospital, London	Smiths/Nuclear Enterprises Ltd
c. 1970	Glasgow Museums Resource Centre	NE4101/ Disonograph	Department of Clinical Physics and Bioengineering, Glasgow	Nuclear Enterprises Ltd
c. 1972	Glasgow Museums Resource Centre	Multiplanar 3D Scanner	Sonicaid Ltd	Sonicaid Ltd
c.1980	National Museum of Scotland Edinburgh	NE4200	Newcastle General Hospital	Nuclear Enterprises Ltd
c. 1986	Science Museum Store, Wroughton	NE42005	Hillingdon Hospital, London	Fischer Ultrasound
c.1989	Science Museum display	Emisonic 4264 'spinner'	Queen Charlotte's Hospital	Nuclear Enterprises/ EMI

It is important to recognise and value these items from the heritage of medical ultrasound that are held by public organisations. But it is, in truth, a paltry record of the equipment used within the NHS as ultrasound moved to take its present place in medical imaging, second in volume only to X-ray imaging. This situation in the public sector makes the BMUS Historical Collection so much more important, because there seems little appetite in the public sector for investment to promote the UK's role in the development of medical ultrasound. The Science Museum is presently in the process of planning a new medical wing, to be opened in 2019. A decision has been made to exclude ultrasound from the displays in the medical imaging section. It is very difficult to understand the rationale that underpinned this decision, which both John Fleming and I have unsuccessfully challenged.

Can or should anything further be done to secure these important heritage items? The first response is that accession by the museums of these objects has placed them in safe hands. The museums will presumably continue to house them, although they may still have the right to dispose of them unless specifically

prohibited at accession. Nevertheless, there are actions that the medical ultrasound community may consider taking. Most obviously, representations should be made from BMUS to these museums, noting the strong interest that the Society takes in the ultrasound equipment in their care and that BMUS members are in a position to offer objects, information and advice on enhancing their holdings.

This action could be reinforced by setting in place a photographic archive of the heritage equipment in the UK, similar to that already established in Germany (www.ultraschallmuseum.de). For a modest outlay, the custodian museums should provide images that could then become part of a BMUS image archive. In this way, the historical value of the items would be confirmed and be made public. At present, only three of the items listed in Table 1 appear in the Science and Society image library of the Science Museum (www.scienceandsociety.co.uk). These are the Smiths Flaw Detector (ref. 10228925), the Emisonic 4264 'spinner' (ref. 10438324) and a rather strange image of an empty Disonograph transducer holder, pointing upwards (ref. 10299552).

Finally, consideration must be given to the appropriate manner in which historical items are secured. At present, the BMUS Historical Collection in Glasgow constitutes the largest collection of historical medical ultrasound equipment in the UK and is hugely valuable as a result. The current cataloguing of the document archive will make this resource more easily accessible. Managing and displaying this equipment remains a challenge. Perhaps consideration should be given to a web-based photographic catalogue?

Historical collections, whether in national museums or held by societies such as BMUS, need to be sustained, and new important items should be added as they become 'historical'. This process is, of necessity, random and depends on individual initiative. The actions of a very few foresighted colleagues in securing the small remaining collection of medical ultrasound hardware is testament to this process. There are

probably numerous items – hardware and documents – in cupboards around the country which deserve to be secured and should be offered to BMUS or one of the national collections for safe keeping. Whilst the BMUS collection is certainly vital in this regard, consideration should also be given to filling the significant gaps in the collections of the main national museums. I hope that this letter succeeds in reminding members of the importance of securing the heritage of UK Medical Ultrasound for future generations.

I am very happy to acknowledge the comments made by John Fleming on an earlier draft of this letter, who kindly clarified several details of the historical background of which I was unaware.

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