HISTORICAL SURGICAL INSTRUMENTS IN THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

A first selection of Instruments and Apparatus on view during the Orthopaedic Congress of the English-speaking World, July 1 to 3, 1952

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Although the Instrument Collection in the Museum of the Royal College of Surgeons of England suffered considerable loss through enemy action in May 1941, it still contains many interesting and historical specimens. Owing to the present limited museum accommodation, the collection must remain in store until it may be possible to place it on view in the building now in process of erection.

At the request of the president of the combined meeting of the Orthopaedic Associations of the English-speaking World, held in London during the first week in July 1952, a selection

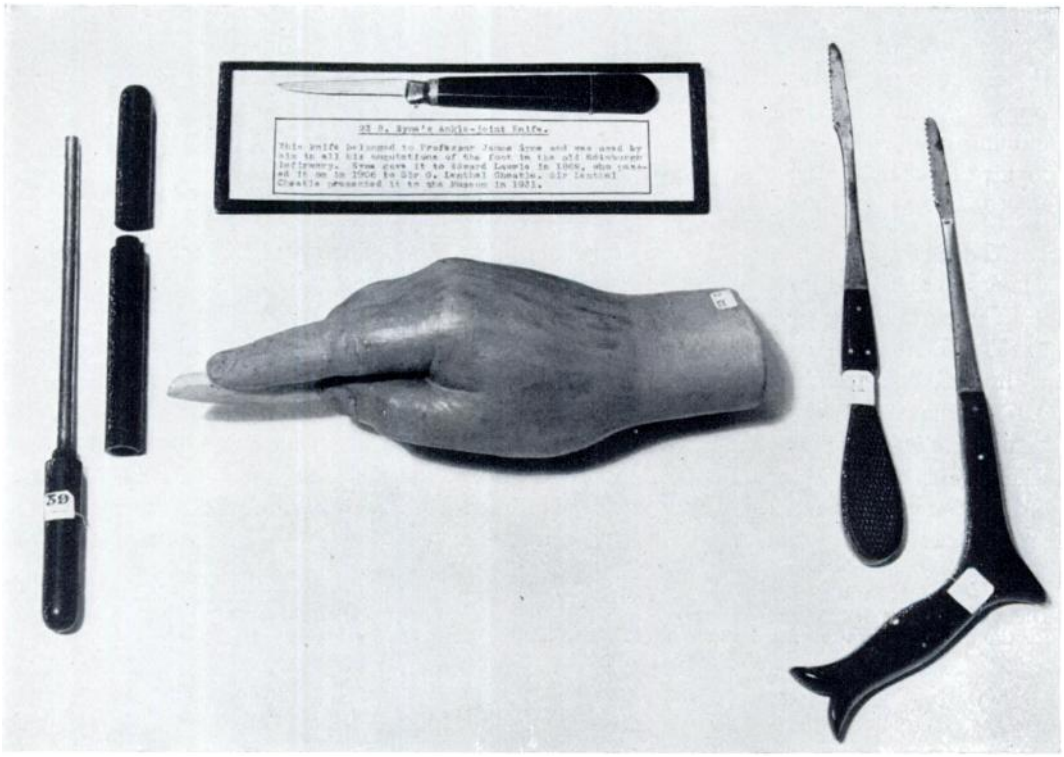

FIG. 1

Left—Liston's " setting instrument " with wooden sheath. Top centre—Syme's ankle knife. Below is shown a plaster cast of the hand of James Syme holding his ankle knife. Right—Two saws designed by William Adams.

of instruments and apparatus was taken out of store and placed on exhibition in the museum for the benefit of overseas visitors and others attending the College for meetings and for the Robert Jones and Moynihan Memorial Lectures. In this article reference is made to some of

the more interesting of these exhibits, and it is proposed to include in future issues further selections of instruments which have historical associations or an interesting story. This will enable readers of the *Journal of Bone and Joint Surgery* to get some idea of what was to be seen during the congress in the display of old surgical instruments and apparatus, and to learn of other specimens in the College Museum Collection.

A " setting instrument which belonged to, and was originally carried by, Mr Liston " consists of a polished steel rod, a quarter of an inch in diameter, mounted in a wooden case (Fig. 1). The wooden sheath when removed exposes the whole length of the rod, five and a half inches; it is also made to unscrew near its middle so that a length of only two and one-eighth inches is bare. Surgeons down to Liston's day kept steels of this kind in constant use to sharpen the edge of the knife. At the beginning of the nineteenth century some were made with ivory handles and kept in morocco-covered cardboard cases.

A knife which deserves particular mention is the ankle knife used by Syme in all his classical amputations of the foot performed in the old Edinburgh Infirmary (Fig. 1). Syme gave it to Edward Lawrie in 1869, who passed it on to the late Sir Lenthal Cheatle in 1906; he in turn presented it to the museum in 1931. Edward Lawrie, who qualified in 1867, published a communication " Upon the results of the Hyderabad Chloroform Commission " (1894) and was the author of " Chloroform: a Manual for Students and Practitioners " (1901). A plaster cast of the hand of James Syme holding his ankle-knife, recently presented to replace the original model lost when the museum was bombed in 1941, was also on view (Fig. 1).

There were two examples of the saw designed by William Adams (1810–1900), one being the original pattern used in the first operation for division of the neck of the femur, and the other with the improved " pistol-shaped " handle (Fig. 1). William Adams gives a full account of the operation which he devised at the Great Northern (now the Royal Northern) Hospital in " A new operation for bony anchylosis of the Hip-Joint with Mal-position of the Limb by Subcutaneous Division of the Neck of the Thigh-bone " (1871), where this identical saw was employed on November 26, 1869. The second example shows the improved handle " which was first made by Mr Blaise for Mr Jowers of Brighton, who found a stronger purchase in the handle than that which I (Adams) had previously used, was desirable."

FIG. 2
R. W. Tamplin's combined sharp- and blunt-ended tenotomy knife.

A beautifully made instrument was that of R. W. Tamplin, F.R.C.S. (1814–1874). On a single handle of ebony are mounted combined sharp- and blunt-ended tenotomy knives. The instrument consists of two knives lying side by side, one with a sharp-pointed and the other with a blunt-ended blade (Fig. 2). The sharp point being exposed, the tissues are punctured and the blade inserted as far as necessary. When the tendon or muscle to be divided is reached, the blunt-ended blade is pushed forwards by means of a thumb-catch working in a slot in the handle to guard the parts from the sharp point; thus the two blades become one cutting edge with a blunt end. Tamplin in 1842 was the first to divide the posterior tibial tendon in infants for talipes varus. He was one of the original 300 Fellows of the Royal College of Surgeons of England. Five other tenotomy knives, preserved in a case, were employed, and presented, by William Adams who worked with Tamplin at the Royal Orthopaedic Hospital.

Of the cases of instruments three are deserving of mention. The first is a British Army surgeon's case of instruments, most of which were made by Stodart about 1800 (Fig 3). It was presented in 1932 and belonged to the great-grandfather of the donor, who probably used it at the Battle of Waterloo. It contains, among other instruments, five amputation knives—three with curved backs and two (large and small) with double-edged straight blades—finger saw, trephines, bullet forceps, dental key and tourniquets. The second is a brass-bound mahogany case of Army Regulation pattern made by Weiss about 1830 (Fig. 4). Of the four amputation knives two are of the Liston pattern for the flap operation, a third

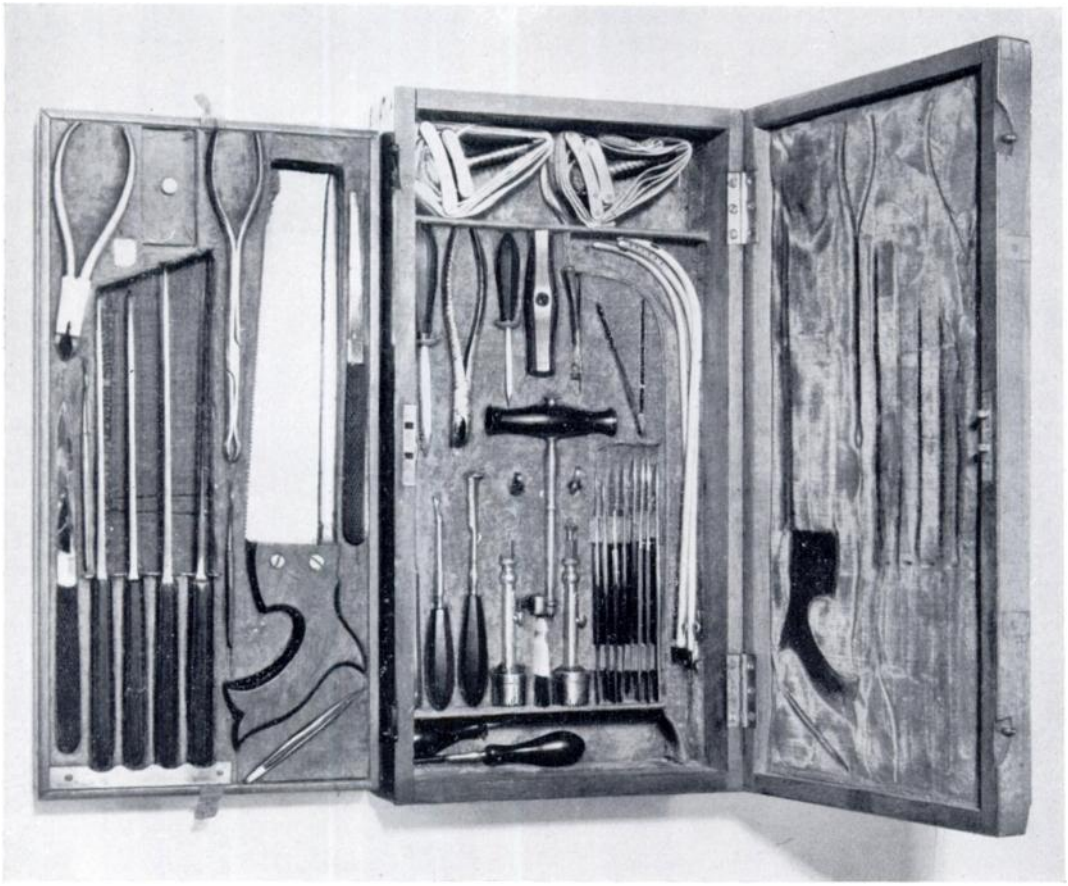

FIG. 3
British Army surgeon's case of instruments made by Stodart about 1800.

for the circular operation, and the fourth and smallest a catlin or interosseous knife. There are two saws. An amputation saw contains Weiss's improvement, which consisted of a series of "slots" at half-inch intervals throughout the cutting edge, or, as the maker's catalogue of 1863 states: "the slots in the blade have the effect of clearing the teeth of the saw during the operation." The other saw is a finger saw. There are also two Hey's saws, trephines, trocars, tourniquets, coin-catcher, etc. All the instruments are in a good state of preservation and show the beautiful workmanship that went into their manufacture. On the lid of this case there is a brass plate inscribed "D. S. E. Bain, Staff Surgeon." David Stuart Erskine Bain (1823–1888) qualified in 1843 and became a F.R.C.S. (Ed.) in 1859. He was appointed Assistant Surgeon to the 80th Foot and retired with the honorary rank of Deputy Inspector General in 1871. The third case of instruments was made by J. Gray and Co. of Sheffield

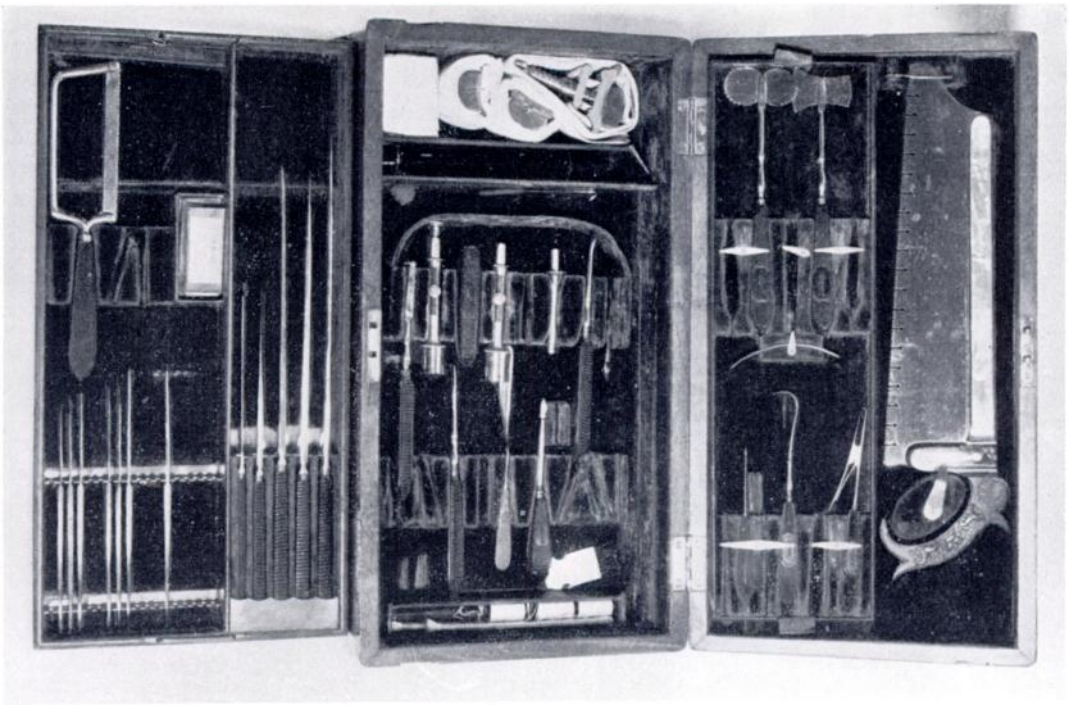

FIG. 4
Case of instruments by Weiss, made about 1830.

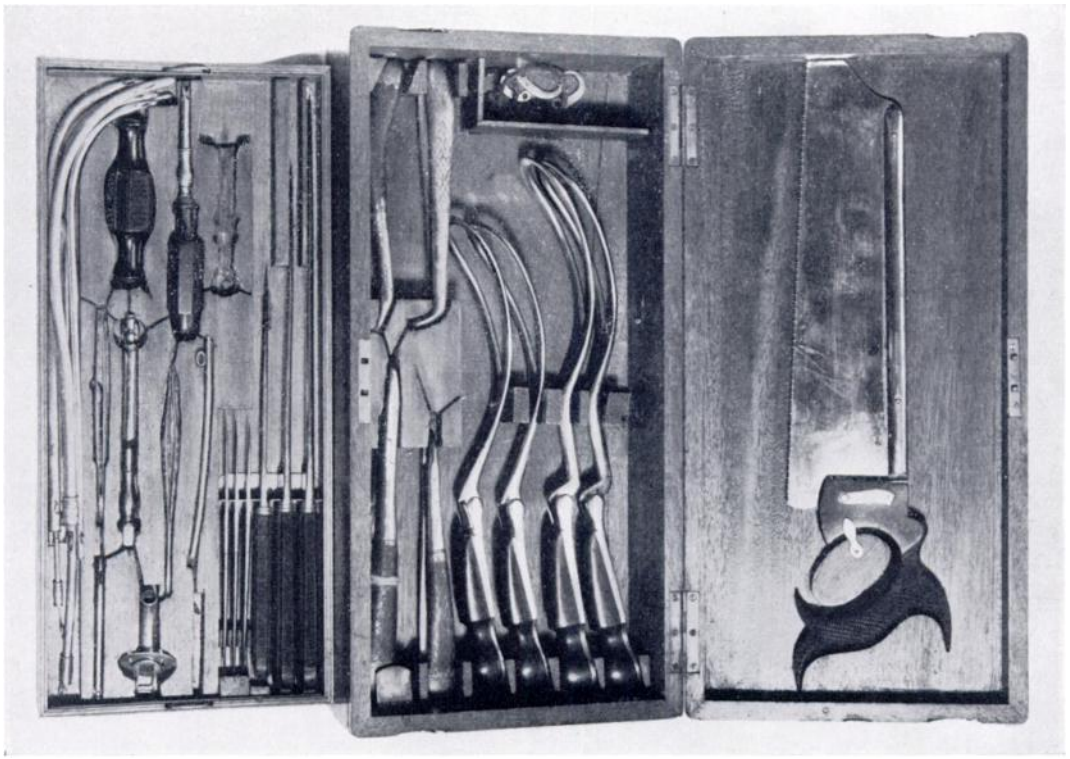

FIG. 5
Case of instruments made about the middle of the nineteenth century by J. Gray and Co. of Sheffield. Formerly the property of Captain Watson, ship's master.

probably about the middle of last century (Fig. 5). It includes three Liston's amputation knives of different sizes, tracheotomy tube, dental key, dental forceps and elevator and two

FIG. 6

Above is shown a case of trephining instruments dating from the middle of the eighteenth century. On the left is a drill stock of Petit's pattern and on the right is a similar instrument of eighteenth century design. Below, centre, are a trephining saw with levers for removal of bone disc made by Boog and Co., and a forceps for removing the circular piece of bone cut out by the trephine.

pairs of midwifery forceps (Denman's and Blundell's). This case formerly belonged to Captain James Watson, ship's master, and was carried by him when in sail sometime after 1862. Captain Watson was born in 1833 at Aberdeen and obtained his master's certificate in

January 1862 in that city. He was master of the Colonial-Aberdeen tea and wool clippers *Granite City* and *Ocean Mail*, each carrying 300 to 400 passengers to Australia. About 1880 he transferred to the old Monarch Line, London, and was master of the *Egyptian Monarch*, troopship to Port Sudan and Suakkim for General Gordon and Sir Garnet Wolseley. Next he transferred to the London-New York Service, and took " Jumbo " to New York in the *Assyrian Monarch* in 1887 for which he received the thanks of the Royal Geographical Society. In 1896 he returned to the sea in charge of *Hesperides* for two voyages and made a record passage. He died in 1928.

Trephining instruments were represented by two cases dating from about the middle of the eighteenth century. One case contains a manuscript note: " This case of trephining

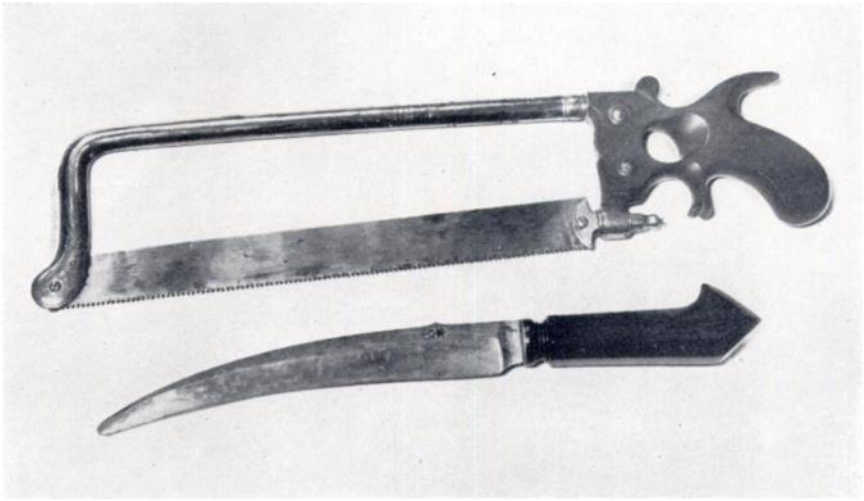

FIG. 7

Above is a large amputation saw. Below it is a curved amputation knife with lignum vitae handle. Both date from the middle of the eighteenth century.

instruments belonged to the late Mr Winterbottom, Member of the Corporation of Surgeons of London and was presented to the Royal College of Surgeons of England, to be deposited in the Instrument Museum, by Thomas Radford, M.D., F.R.C.S.Edin., F.R.C.S.Eng., September, 1874 " (Fig. 6). Most of the instruments in this case are illustrated in Samuel Sharp's treatise on the operations of surgery (1739), Plates 8 and 9. The other case contained instruments of similar design and date of manufacture. Of the two drill stocks, one was a Petit's with artistically fashioned stock and highly ornamented ball-grip and thumb spring-catch for releasing the shaft of the saw from the stock, stamped " Paris " surmounted by a trefoil (Fig. 6), an excellent illustration of which is figured in Seerig's *Armamentarium* (1838), Plate 74. The other (Fig. 6) resembles somewhat the drill stock figured in Brambilla's *Instrumentarium* (1782), Plate 9. An elaborate trephining saw made by Boog and Co., a firm which became extinct about 1870, bears on each side a spring lever controlling parts of the saw containing three teeth (Fig. 6). By this mechanism the disc of bone can be raised after it has been cut by the saw. The last trephining instrument to be mentioned is a pair of forceps for removing the circular piece of bone cut out by the trephine (Fig. 6). This was illustrated and described by Samuel Sharp in Plate 9 of his treatise. " Upon one of the handles is added a little Elevator to lift up any small Splinter of Bone, but it is not of much use." It was presented to the Museum in 1805 by a Mr Grice, who founded a firm later known as Krohne and Sesemann.

Two instruments made about the middle or towards the end of the eighteenth century were a bow saw for amputations (Fig. 7) (figured in Sharp's treatise of 1737) and an early

example of a curved amputation knife (Fig. 7) with lignum vitae handle turned upwards at its free end to prevent the hand slipping, and bearing what is presumed to be a finger-rest on the back of the blade near the handle. The handle of the saw is shaped for the fingers and thumb, and has a hole, round on one side and oval on the other, for the forefinger (this hole is not shown in Sharp's illustration). The frame is engraved with a design on each side

FIG. 8

The formidable instrument above is a circular saw for cutting bone. It was driven by a coiled spring. Presented in 1871. Below it is Machell's saw with forceps to grip the bone.

of its free end. The cutting blade is attached to the frame by two screws, and can be tightened from the handle end by a nut. The knife is called " Perret's " in Seerig's *Armamentarium* (1838), Plate 131, but in J. J. Perret's *L'Art du Coutelier* (1772) the two illustrations of amputation knives on Plate 124 are quite different in design, having a more distinct curve with sharp-pointed blades. Sharp, in Plate 14A of his treatise of 1739, illustrates a knife of similar design to the example shown and states that it should be about thirteen inches in length; the specimen exhibited measures thirteen and a half inches. Both of these instruments

bear a similar cutler's mark, a star surmounted by a crown. Maker's names did not appear on instruments until the latter part of the eighteenth century.

A formidable instrument was a circular saw for bone (Fig. 8). The saw is nine inches in diameter, has very large teeth, and works with geared cogs on a coiled spring. It is mounted on a wooden handle bearing a steel finger-guard, and weighs 2 pounds 14 ounces. It has no maker's name or trade mark, and has not been identified in any publication. It was presented to the museum by W. H. B. Winchester in 1871.

A sample of Machell's saw with forceps to hold the bone (Fig. 8) is evidently a modification of that surgeon's original pattern. An article entitled "Description of an Annular Saw; by Mr Machell, Surgeon of Walsingham," appeared in the *London Medical and Physical Journal*

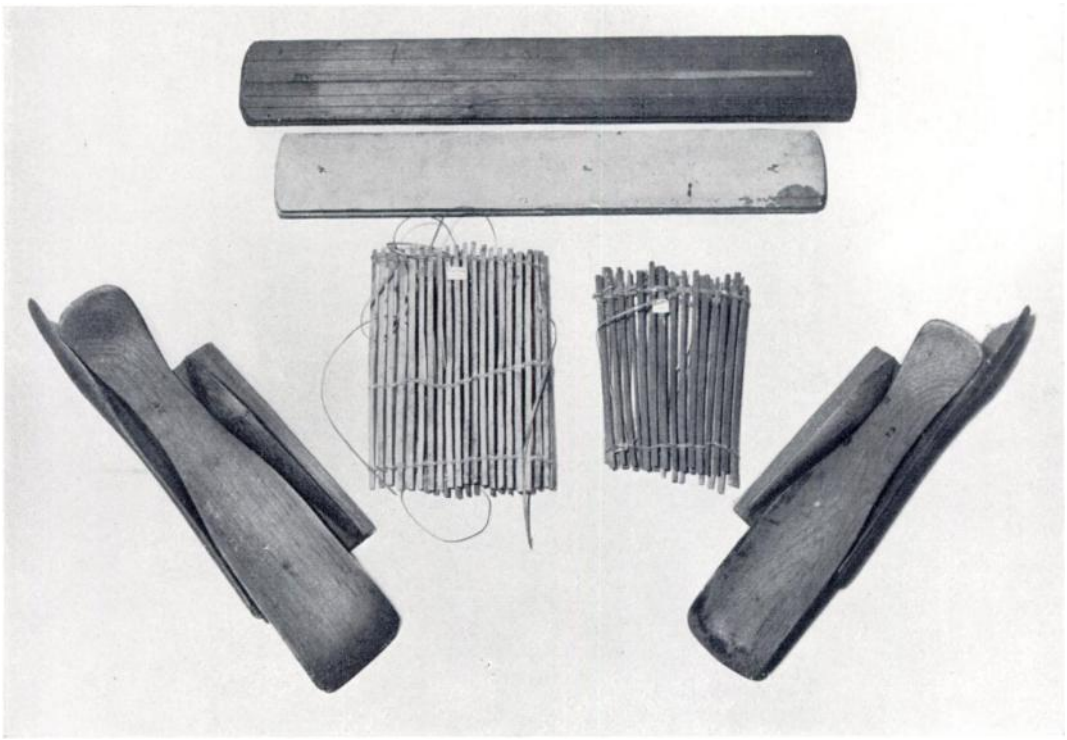

FIG. 9.
Gooch's splints (above) compared with cane splints made by the Kengah tribe in Sarawak. At right and left are Gordon's splints for treatment of Colles fracture.

(1815) and was republished with additions and a plate in the *Edinburgh Medical and Surgical Journal* (1815), where the author wrote: "I am induced to give the following description of my annular saw from the very flattering reception it has met with from the Earl of Stanhope, by whose approval and patronage I have been honoured, and also by several surgeons of the highest professional eminence in the Kingdom, by whom my annular saw is acknowledged to supersede the use of the trephine, trepan, Hey's saw, bone-nippers, rasp, the mallet and chisel, etc., in all cases where any portion of carious bone demands the interference of our art to remove it."

Examples of splints were two pairs described and illustrated by Benjamin Gooch (Fig. 9) in "Cases and Practical Remarks: with Sketches of Machines of Simple Construction, Easy Application and Approved Use" (1758). "It is made of deal one-eighth of an inch thick, with leather glued to it, and cut through to the leather to the distance of one-sixth of an inch . . ." By the side of Gooch's splints for comparison were two cane splints of the kettle-

holder type (Fig. 9), made and used by members of the Kengah tribe, Barham District, Sarawak. They consisted of thin flat pieces of cane, lying parallel and held together with fibrous cords near each end and in the middle. The right and left Gordon's splints (Fig. 9) for treatment of Colles fractures of the radius are described and figured in "A Treatise on the fractures of the lower end of the radius, etc.," published in 1875 by Alexander Gordon, M.D., Professor of Surgery, Queen's College, Belfast. W. H. B. Winchester's cradle for fracture of the tibia and fibula (Fig. 10) consists of two mahogany bars, each carrying a row of adjustable pads, seven on one and six on the other. The pads allow the surgeon to adapt the pressure to the form of the limb.

Three model beds (Fig. 11) aroused interest. The first was a fracture bed in which the mattress fixed to a brass frame can be elevated and tilted at various degrees to the right or

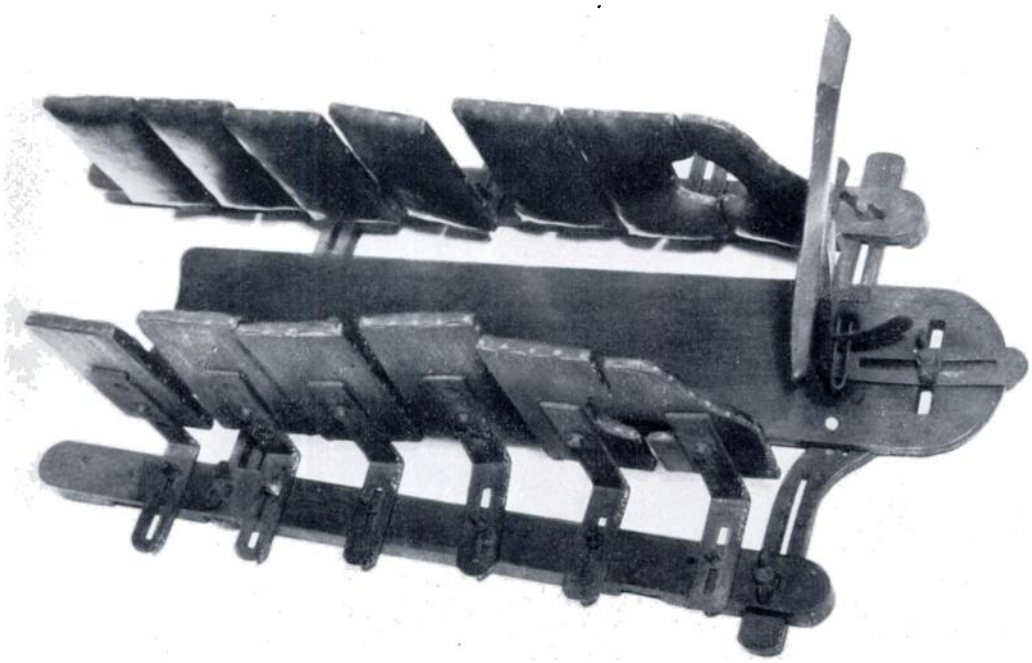

FIG. 10

Winchester's cradle for treatment of fractures of the tibia and fibula. The pads are adjustable to conform with the contour of the limb.

left; the second a bed invented by W. H. B. Winchester (Fig. 11) and exhibited in the International Exhibition of 1873, in which the bedding can be removed and changed without disturbing the patient; and the third a bed invented by James Luke (Fig. 11) for fractured thigh, etc., in which a frame fitted on pivoted rods can be elevated so that the mattress below can be removed.

W. H. B. Winchester (1816-1901), whose name has been mentioned several times in the foregoing notes, became F.R.C.S. by election in 1853; he invented a number of pieces of orthopaedic apparatus and received honourable mention at the International Exhibition of 1862 for improvements in splints for fractures.

A spinal support with stays (Fig. 12) for incipient lateral curvature consisted of a triangular steel frame engraved with a florid pattern, and made to be adjusted to the amount of deformity. It is fitted with straps so that it can be fastened securely under the axillae.

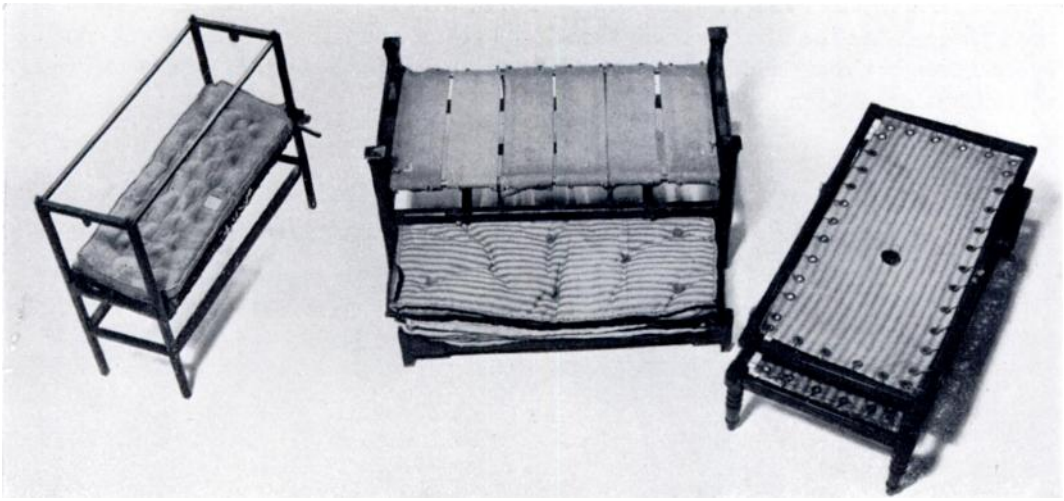

FIG. 11

Models of three early beds. On the left is a fracture bed with tilting mattress. In the middle is Winchester's bed designed to permit changing of the bedding without disturbing the patient. On the right is a fracture bed designed by James Lake; the top frame can be elevated so that the mattress below may be removed.

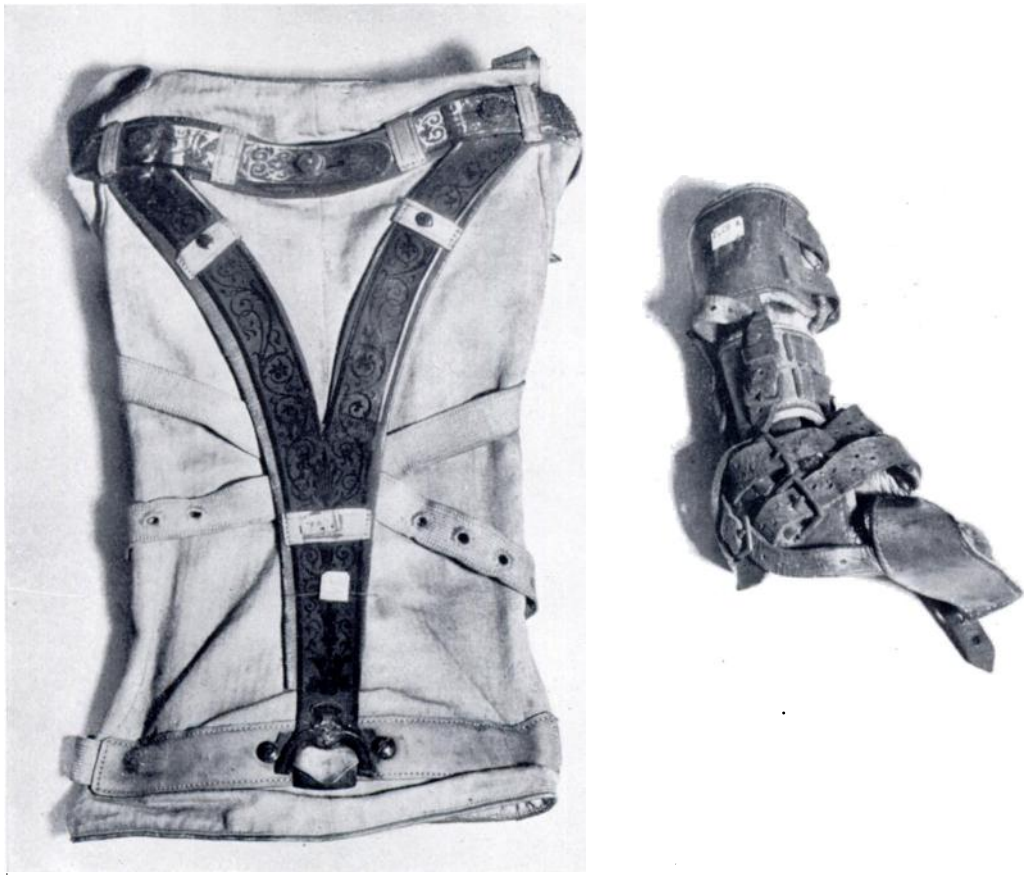

FIG. 12

Left—Spinal support with engraved steel frame. Right—Scarpa shoe for treatment of talipes equino-varus. This specimen had been worn by the donor for eighty years.

This frame is adjusted to a surgical corset, which laces in front. The specimen, which was in the museum when the first manuscript catalogue of the instrument collection was compiled in 1878, has no history or donor's name. The Scarpa shoe (Fig. 12), used in a case of talipes equino-varus, was worn by the donor for eighty years.

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