Sound Designs: the story of Boosey & Hawkes
Gallery exhibition catalogue

The name Boosey & Hawkes is synonymous with wind instruments in Great Britain. The story of the company and its predecessors is the story of wind instrument production and use in Britain and its former colonial territories. It is deeply interwoven with the development of the brass band and with the unique and celebrated wind sound that characterised British orchestras during the first half of the 20th century.

Boosey & Hawkes was established by the 1930 merger of Boosey & Co. and Hawkes & Son, two rival firms that had been a vital force in shaping wind instrument playing in Britain since the mid-19th century. Boosey & Hawkes absorbed almost all other London based manufacturers of wind instruments, including Besson and Rudall Carte. At the height of its power in the 1960s as one of the world's largest producers of wind instruments, the company employed over 700 people at its Sonorous Works in Edgeware, North London. Mass production techniques pioneered by Boosey & Hawkes enabled the factory to make over 1000 instruments a week. However, by the close of the 20th century, the range of instruments produced at Edgeware had significantly decreased. In 2001 the Edgeware factory was sold. A smaller premises in Watford was leased for the building of brass instruments and the firm was rebranded as Besson. The 2006 purchase of Besson by the French woodwind maker Buffet Crampon marked the end of large scale instrument manufacture in Britain. Instrument making in London has returned to a situation similar to that before the advent of Boosey & Co., with small-scale production of instruments carried out by specialist makers.

The factory housed an important museum of historic and technically innovative instruments that was a source of inspiration for the company's designers and makers. Boosey & Hawkes also maintained extensive archives that recorded the details of instrument design and production.

The museum instruments and archive were acquired by the Horniman in 2003 and form the core of this display. They give us a special insight into the output and influence of Boosey & Hawkes and enable us to understand how their work helped to shape the development of the brass band and the sound of British orchestras. This display explores the lasting contribution the company has made to musical instrument design and enjoyment worldwide.

We gratefully acknowledge the support and assistance we have received from the following individuals and organisations in the development and production of this exhibition: the staff of Boosey & Hawkes and Besson; the Heritage Lottery Fund; the Art Fund; Arnold Myers and the University of Edinburgh; Robert Barclay; Sofia Tsikala; David Salmon; London Musical Instruments.

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Footage of Bob Barclay © Canadian Museum of Civilisation, Opus featuring Bob Barclay, trumpet maker, October 1992, V93-0026, 13.G.22

Information in this booklet compiled by Bradley Strauchen
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HORNIMAN MUSEUM

From Music Publishing to Instrument Making

Thomas Boosey established himself as a bookseller in London in 1792 and soon distinguished himself as a publisher of foreign music in Britain. Several important early alliances with musical instrument makers led to instrument production at Boosey & Sons. The earliest was with Prussian military bandsman Carl Boosé, author of the groundbreaking sheet music publication *Boosé's Military Band Journal*. Boosey & Son acquired the journal and produced a wide range of wind instruments in collaboration with Boosé during the 1850s. This established the firm in military music. Flute making came to the fore in 1856, when Boosey & Sons worked with flute virtuoso R.S. Pratten to produce instruments that he designed. Boosey & Co. became a pillar of the brass band world in 1868, when they purchased the firm of Henry Distin, which introduced the saxhorn family to England and designed a range of innovative brass instruments. In 1930, Boosey & Co. merged with its largest competitor, Hawkes & Son. Boosey & Hawkes went on to purchase rival firms such as Besson. Music publishing remained a core activity and enabled Boosey & Hawkes to offer musicians a complete service, supplying music and the instruments with which to play it.

From Music Publishing to Instrument Making
Object labels

1 **Illustrated timeline displayed in the Boosey & Hawkes museum**
2004.1122

2 **Advertisement**, Boosey & Co., late 19th century
2006.335

3 **Bb clarinet**, Carl Boosé, London, *c.*1850
Carl Boosé emigrated to England in 1835 to take up a post as a clarinet player in London. This instrument was exhibited at the 1851 Crystal Palace Exhibition
2004.846

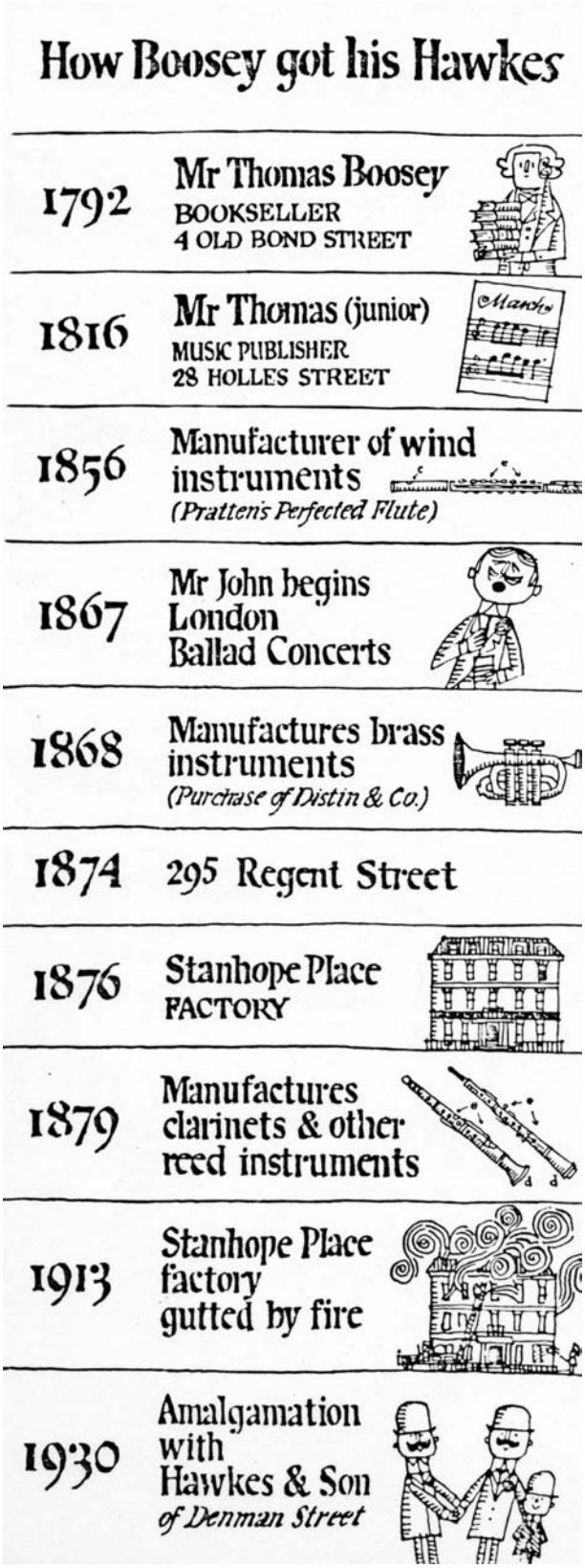
4 **Flugelhorn with rotary valves**, Carl Boosé, Boosey & Sons, London, *c.*1855
Rotary valves were popular in Germany. Boosé promoted 'rotary cylinder action' as a new and special feature of the instruments that he produced with Boosey & Sons.
2004.903

5 **Flute, cylindrical bore**, R.S. Pratten, Boosey & Co., London, 1869
This cylindrical bore flute with its large tone holes was designed to compete with instruments being produced by Theobald Boehm.
2004.844

6 **F tenor saxhorn or saxotromba**, probably Sax, Paris, *c.*1846-49
Inscribed on bell 'sold by Distin'. The saxhorn family, invented by Adolphe Sax, was the backbone of the brass band. The bass, euphonium, baritone and tenor horn are all derived from the saxhorn.
EUCHMI 887 Lent by the University of Edinburgh

7 **Tenor euphonion**, Distin, London, *c.*1856
2004.1134

8 **Eb soprano cornet**, Distin, London, *c.*1850
2004.811



Illustrated timeline displayed in the Boosey & Hawkes museum
2004.1122
Boosey & Hawkes Archive, Horniman Library

Collecting Ideas

The musical instrument collection at Boosey & Hawkes was a living resource for the instrument designers and makers working at the factory. Instruments with innovative key and valve systems by makers throughout Europe served as an inspiration for Boosey's designers. Instruments with an interesting history or special provenance were collected as well. The museum was also a repository for experimental instruments made by Boosey but sadly, a systematic collection of their output was not made.

The collection was begun by Works Manager David James Blaikley in the late nineteenth century and was housed in a museum room within the factory. D.J. Blaikley was an important figure in the early history of musical instrument collecting. In an era when there were few instrument collections in public museums, many instruments from the collection were lent to public exhibitions such as the Musical Loan Exhibition of 1905 and the Royal Military Exhibition of 1890.

During the 1950s and 60s, the collection was developed into an important educational resource by Eric McGavin. Performers, school groups and researchers were regular visitors to the collection. Tours of the factory at Edgware were also an educational feature.

Eric McGavin, Boosey & Hawkes education advisor and museum curator, demonstrates the cornu (28 in this display) to students at Hemel Hempstead Grammar School, *c*.1960. By kind permission of Kim McGavin

Collecting Ideas
Object labels

9 **Trumpet, disk valves**, John Augustus Köhler, London, *c*.1850
Disk valves, patented by John Shaw in 1838, were one of the many experimental valve types to appear in the 19th century.
2004.870

10 **Keyed bugle**, Joseph Higham, Manchester, *c*.1857
A rotary valve was incorporated into this bugle to increase its range. The valve is Higham's 'clear bore' patent, designed to be free blowing.
2004.869

11 **Cornet, conical bore valves**, Rudall Carte & Co, London, 1931
This instrument is an example of Rudall Carte's 'Patent Conical Bore' valves in which the bore increases progressively within and between the valves. This was designed to equalise tone and response between open and valved notes. Trumpets using this system were marketed as 'Webster Trumpets'.
2004.799

12 **Cornet, Samson valves**, Rudall Rose Carte & Co., London, *c.*1872-78
Samson's 'finger-slide' valves have pistons that move in a tube that continues into the windway at both ends. It is difficult to identify any real advantages for this system, but these instruments have a high standard of workmanship and elegant design.
2004.782

13 **Flugelhorn**, D.J. Blaikley, Boosey & Co., London, 1891
Experimental compensating valve system. The 1905 stockbook record for this instrument contains the first written reference to the Boosey & Hawkes museum.
2004.1135


Who says "there is nothing NEW under the Sun!"

YOU might say this upon entering our drawing office, but you would change your mind before leaving. Look at the collection of antiques, our museum, worth over £1,000, Shawms, Serpents, Ophicleides, etc., all of which are there for possible guidance. The acoustic experts, highly qualified men with college degrees, are constantly evolving designs, experimenting with new bores, in fact new everything. Occasionally something new is found—very rarely we must admit, but there it is for the musician of to-day at his service for his pleasure and profit. It was in this office that the "N.V.A." valve was created, here that the hydraulic dies for brass instruments were designed. It may be taken for granted that when a better design can be produced for any part, or whole instrument, it will emanate from this office. It is open to satisfy your curiosity, come and see it!

Advertisement from a *c.*1935 Boosey & Hawkes catalogue featuring the collection in the Boosey & Hawkes museum. By kind permission of the University of Edinburgh Collection of Historic Musical Instruments

14 **Bass flute**, Wigley & McGregor, London, *c.*1820
The extra length of this instrument is accommodated in the head joint, which doubles back on itself.
2004.769

15 **Steckel Boehm system flute**, Gautrot-Marquet, Paris, *c.*1880
Big rectangular tone holes were used to produce an instrument with a large, full tone to compete with popular flute designs by Boehm.
2004.819

16 **Flute**, Claude Laurent, Paris, 1816
Glass was used for the body of this flute to avoid the cracking and warping to which wood and ivory were prone. The use of glass necessitated the design of innovative metal pillars to mount the keys. The flute was one of the few wind instruments thought to be acceptable for the early 19th-century gentleman amateur to play. The jewel-like appearance of Laurent's glass flutes would have heightened their appeal and status as aristocratic accoutrements.
2004.1190

17 **Northumbrian smallpipes**, probably Dunn, Northumbria, *c.*1805
This instrument was owned by famed woodcut engraver Thomas Bewick and later by the illustrator and Punch cartoonist Charles Keene. Both were active musicians.
2004.868

Woodcut by Thomas Bewick from *A Natural History of Water Birds*
Horniman Library

18 **Bb clarinet, Ward's 1855 patent key system with extra roller keys**, Cornelius Ward, London, *c.*1855
2004.852

19 **Cor anglais**, Henri Brod, Paris, *c.*1835
Brod was the first maker to extend the compass of the cor anglais to Bb.
2004.874

20 **Bassoon**, Harmen Wietfelt, Burgdorf, *c.*1700
2004.1123

21 **Tárogató**, Josef Schunda, Budapest, *c.*1904
This tárogató, a national instrument of Hungary, was brought to England by Hans Richter for performances of Wagner's *Tristan und Isolde*. At Richter's suggestion, it was used as a substitute for the shofar in performances of Elgar's *Apostles* by the Hallé Orchestra, Manchester.
2004.1069

A Musical Empire

Boosey & Hawkes had factories in London, Malta and India and offices in the United States and Australia. Their output encompassed wind and percussion for orchestras, military and brass bands. It also included instruments such as Hammond organs and Wheatstone concertinas. Musicians using Boosey & Hawkes instruments included jazz and music hall performers, bandsmen and orchestral players around the world.

During World War II, the firm's metal working equipment and expertise were pressed into service and the Boosey & Hawkes factory in Edgware was requisitioned for the production of components for Lancaster bombers and Spitfire fighters . Production of non-musical goods such as Wirex cockpit voice recorders, heater components and soda siphon casings continued as a sideline after the war.

The commercial and musical reach of Boosey & Hawkes extended around the globe, perpetuated by the spread of English business and culture during the expansion of the British Empire. Boosey actively participated in international trade exhibitions such as those held at the Crystal Palace, London, and in Leipzig and other cities around the world.

Aircraft component production at the Boosey & Hawkes factory in Edgware during World War II, Boosey & Hawkes Archive, Horniman Library

A Musical Empire
Object labels

22 **Drum major's mace**, Boosey & Hawkes, London, *c*.1965
2006.245

23 **Drag horn**, Boosey & Co., London, 1890
EUCHMI 1083 Lent by the University of Edinburgh

24 **Bass fanfare trumpet**, Besson, London, *c*.2003
2006.328

25 **Herald's trumpet**, **Eb**, Boosey & Co., London, 1911
This trumpet was made for the visit of King George V to Edinburgh in 1911.
EUCHMI 2525 Lent by the University of Edinburgh

26 **Regimental bugle**, Boosey & Hawkes, London, 1946
2006.464

27 **Workshop order book**, Boosey & Co., 1914

Bugle production soared during World Wars I and II at Boosey & Hawkes, as is poignantly illustrated in the factory production records, where clerks gave up on entering information for each instrument as was usual and instead indicated bugle production in batches.
A227/053

28 **Facsimile of a Roman cornu**, Boosey & Hawkes, London, 1945
Built for the Northern Command Tattoo in 1954 and based on bronze instruments found at Pompeii.
2004.1205

29 **Exhibition medals, awarded at the Leipzig Trade Fair**, 1968, 1975
2006.329; 2006.330

30 **Tenor ventil horn**, Henry Distin, London, 1857-68
This instrument is one of many, some of which are fanciful, that are depicted on the cover of the *DISTIN-guished Gallop* (31).
EUCHMI 576 Lent by the University of Edinburgh

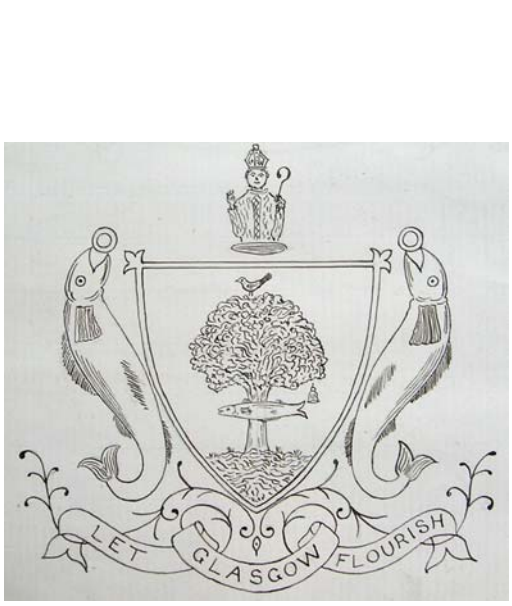
31 **Sheet music commemorating Henry Distin's success at the London International Exhibition of 1862**
A1/12/15

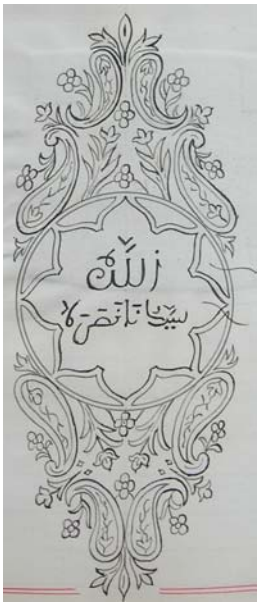
Quintet of ventil horn players, late 19th century
Adam Carse Archive, Horniman Museum

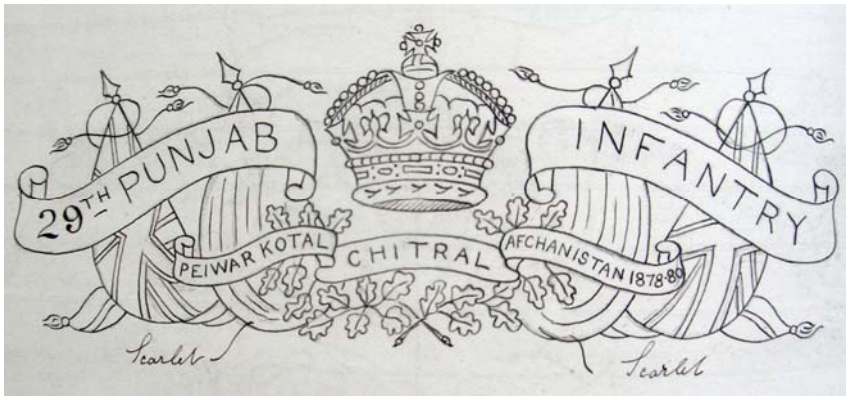
32 **Euphonium, ‘Chicago bore’**, Besson & Co., London, 1895
Besson designed their range of ‘Chicago bore’ instruments for the World’s Columbian Exposition held in Chicago in 1893.
2004.1139

33 **Contrabass trombone with double slide**, Boosey & Co., London, 1885
The extra length of this instrument is accommodated in its double wrapped slide. The design was introduced at the 1861 Crystal Palace brass band contest. This example was built for the International Inventions Exhibition, London of 1885 and was displayed at the Royal Military Exhibition in 1890.
2004.1189

34 **Regimental drum**, Boosey & Co., London, *c*.1870
Decorated with the insignia of a regimental band in Kapurthala, Punjab, India. Boosey & Co. provided drums for regiments throughout the British Empire.
2004.1172







Insignia of bands around the world recorded in the drum design books of Boosey & Co.
Boosey & Hawkes Archive, Horniman Library

35 **Ballad horn**, Distin, London, 1869
'Ballad horn' was a registered trade name of Boosey. This easy to play instrument pitched in C married the popularity of ballad repertoire with the growing amateur interest in brass playing and was designed to perform the vocal music Boosey & Co. promoted at their ballad concerts.
2005.1

36 **Concertina**, English system, George Case of Boosey & Sons, London, *c*.1860
Concertina making at Boosey can be traced to the production of George Case's concertinas at Boosey & Son in the 1850s.
M635a-1996

37 **Miniature mouth organ**, Wheatstone, London, *c*.1950
Boosey & Hawkes produced Wheatstone instruments, including concertinas and mouth organs, during the 1950s, 60s and 70s.
M333-1996

38 **Cornet**, Besson, London, *c*.1879
Engraved 'Diamond Fields South Africa'. This cornet was presented to James Saunders in 1879 by the members of the Kimberley Quadrille Society. Kimberly, South Africa is the site of the world's largest diamond mine.
2004.780

39 **Alto orpheon in Bb**, Boosey & Co., London, 1888 – 1889
EUCHMI 4501 Lent by the University of Edinburgh

40 **Tenor orpheon in Eb**, Boosey & Co., London, 1888 – 1889
EUCHMI 4503 Lent by the University of Edinburgh

41 **Baritone orpheon in Bb**, Boosey & Co., London, 1888 – 1889
EUCHMI 4505 Lent by the University of Edinburgh

42 **Bass orpheon in Bb**, Boosey & Co., London, 1888 – 1889
EUCHMI 4507 Lent by the University of Edinburgh

Only twelve orpheons were built, all for export, including a set that was built for Patrick Gilmore, the 'father of the American band'.

Brass instrument making

The basic process of making a brass instrument involves forming flat sheets of metal into a three-dimensional instrument. The two films contrast Bob Barclay making a trumpet using the methods of 17th century Nuremberg makers with modern large-scale brass instrument production at Boosey & Hawkes and Besson. Some processes differ greatly. Contrast the hand hammering and burnishing historically used to form the bell section with the use of high-speed lathes for bell spinning in modern factories. Compare the historic process of hand bending straight tubing filled with lead or pitch to form curved parts with the use of highly pressurised water to instantly mould tubing into its finished shape.

Modern production uses specially designed machines, many of them automated, to speed up instrument manufacture and to ensure a consistent product. The use of these machines has deskilled many of the jobs previously carried out by hand, but some processes, particularly finishing work, depend on skilled craftsmen using tools and techniques that a historic maker would recognise.

Brass manufacture
Object labels

43 Polishing mop
Made of soft cotton. Used at Besson, Watford on spindle with rouge for the polishing of brass instruments to a mirror finish.
2006.242

44 Polishing stick
Used at Boosey & Hawkes, Edgware and Besson, Watford for holding cornets during polishing.
2006.289

45 Pumice stone
Pumice was used to smooth the edges of linishing belts, which were used for the rough finishing of brass instruments.
2006.239

46 Mop rake
Used at Boosey & Hawkes, Edgware and Besson, Watford for softening the edges of polishing mops.
2006.243

47 Rouge
This rouge was applied to a polishing mop for the final polishing of brass instruments at Besson, Watford.
2006.234

48 Drawplate
Used at the Boosey & Hawkes factory, Edgware. Tubing is pulled through a drawplate to form it into the precise diameter needed for the various sections of cylindrical tubing that make up the body of a brass instrument. The drawplate is used on a draw bench, which is equipped with a powerful chain-driven mechanism to pull the tubing through the plate. This process is referred to as swaging.
2006.339

49 Bending iron
Used at Boosey & Hawkes, Edgware as a jig for bending tubing by hand.
2006.455

50 Measuring stick
Used for measurements during instrument assembly at Boosey & Hawkes, Edgware and Besson, Watford. Imperial measurements were used.
2006.244

51 **Tapered forming iron**
Used at Boosey & Hawkes, Edgware for hand work such as debruising of bell sections and shaping large flanges.
2006.241

52 **Forming plate with forming iron and flanges**
This tool was used at Boosey & Hawkes, Edgware for shaping flanges into the desired curvature. Flanges are used as a point for fixing stays, braces, finger rings, etc. to the tubing of brass instruments.
2006.456

53 **Forming iron**
Used at Boosey & Hawkes, Edgware for shaping flanges.
2006.235

54 **Shaper**
Used at Boosey & Hawkes, Edgware and Besson, Watford for shaping and smoothing metal parts, such as flanges, around forming irons.
2006.238

55 **Cornopean (cornet), Stölzel valves**, Charles Pace, 49 King Street, London, *c*.1840.
Charles Pace and his sons were the main manufacturers of Cornopeans in Britain.
35.107

56 **Parts kit for Besson CC tuba**, Markneukirchen, Germany
From 2001, Besson brass instruments were built in London from parts made in Germany . This tuba has never been assembled. There are over 100 parts.

2006.233

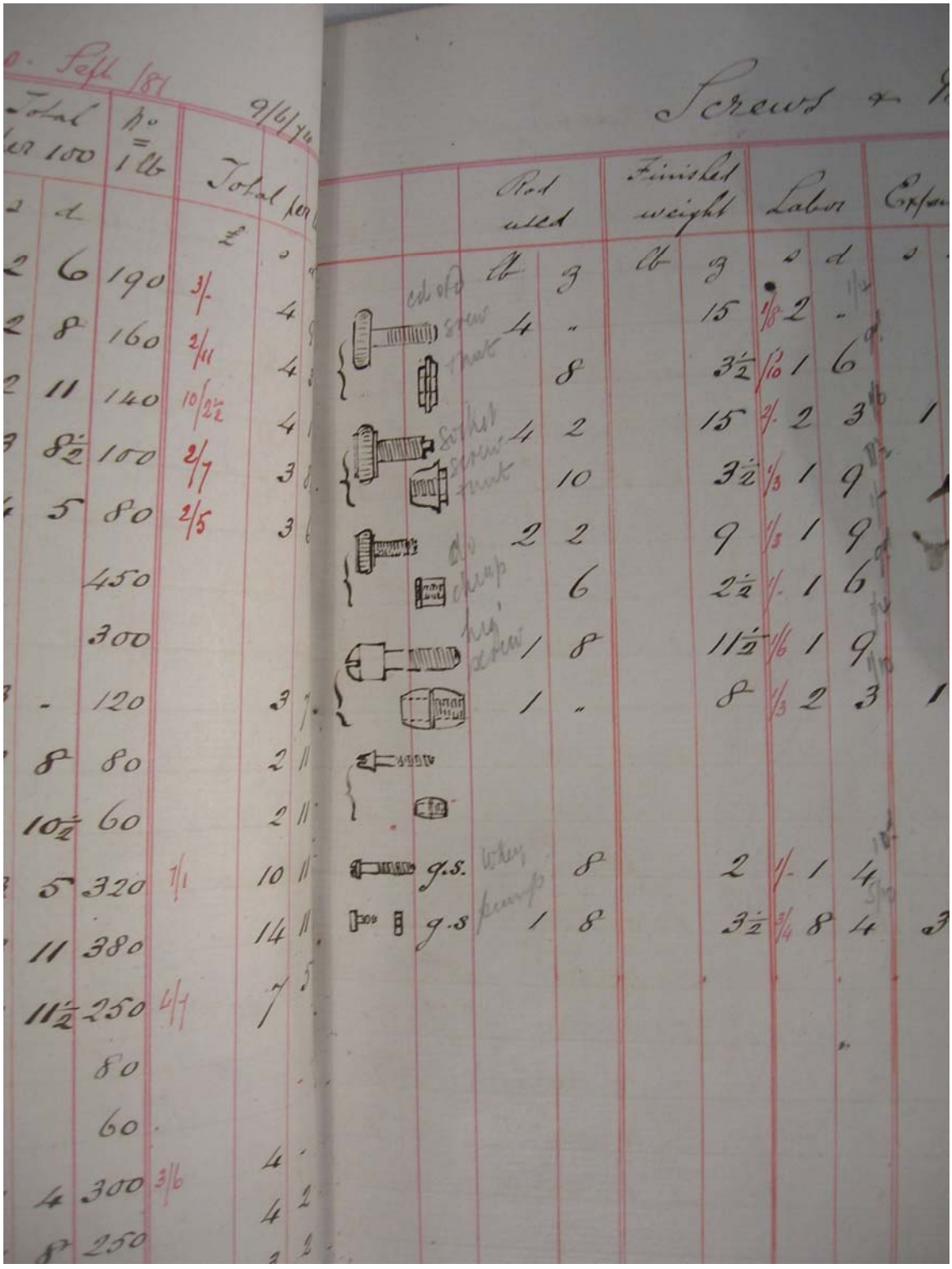
Pete Byrne polishes the bell of a cornet at London Musical Instruments
Horniman Museum

About brass

The flat sheets of metal used to make brass instruments are a mixture of copper and zinc, extracted from ores, or rocks. Initially, brass was made by diffusing, or combining ores, as it was difficult to extract the zinc from its ore. This was known as the cementation process. From about 1800 the direct method of making brass was more common. This process alloyed, or melted, the copper and zinc together ensuring a much better quality metal. Today brass is commonly a mixture of 70% copper to 30% zinc. These two stages in the development of brass technology can be identified in musical instruments by using non-destructive analytical techniques such as x-ray fluorescence (XRF). Such a technique has been used to study all of the instruments in the Horniman collections by the Pace family.

What's in a name?

Many 'brass' instruments have components made from a metal commonly known as German silver. Traditionally silver was used for garlands, keys, ferrules and other decorative elements but from about 1800 a new metal made of copper, nickel and zinc became available. This is properly called nickel brass but is known as paktong, nickel silver or German silver, although there is no actual silver in the alloy.



Detail from pricing book showing components used in brass instrument assembly, Boosey & Co, 1874
Boosey & Hawkes Archive, Horniman Library

57 **Trumpet after Hans Hainlein of Nuremberg (1632)**, Bradley Strauchen, Edinburgh, 2002
This trumpet was made at a workshop taught by Bob Barclay and Richard Seraphinoff. Bob Barclay has specialised in making copies of historic trumpets using only techniques and materials that would have been available to the original makers. This creates a much more characteristic copy of a historic instrument than those that are made using modern manufacturing techniques.
P405.1

58 **Brass sheet cut for bell section**
A template, often made from sheet iron, is used to trace the pattern for the bell onto a flat sheet of brass, which is then cut out with tin snips. One edge of the bell flare cut-out is nipped with shears to form tabs.
P405.2

59 **Partially formed bell garland**
This extra layer of metal strengthens the thin metal of the bell rim. The garland is an ideal place for a maker's inscription and engraving and is often made from a different highly decorative metal such as silver or nickel brass.
P405.3

60 **Brass sheet cut for tubing**
Before the advent of seamless extruded tubing in the 1850s, all tubing was rolled from flat sheet. The metal was annealed and rolled over a mandrel.
P405.4

61 **Partially finished tubing**
The two edges of the brass sheet are brought edge to edge to form a butt join and are then brazed. The tubing will then be pulled through a drawplate to finish it.
P405.5

62 **'Dimpled' tubing**, Boosey & Hawkes, London, *c*.1950
Water under high pressure is used to expand compressed or 'dimpled' tubing into the mould to form instrument components such as bell branches and valve slides. This near-instantaneous process replaced hours of hand work.
2004.970.1

63 **Tubing after hydroforming**, Boosey & Hawkes, London, *c*.1950
2004.970.2

64 **Hydroformed baritone bell stem**, Boosey & Hawkes, London , *c*.1950
Boosey & Hawkes developed the hydroforming process during the 1930s. It revolutionised brass instrument making and marked the beginning of large-scale mass production.
2004.974

65 **Technical drawing of die used for hydroforming with section of hydroformed tubing**, Boosey & Hawkes, 1984
This tubing would be cut to form valve slides and knuckles.
T26389, 2004.971.2

66 **Tubing in hydroforming die**, Boosey & Hawkes, 1980

Small Workshops and Boosey & Hawkes

The success of large companies like Boosey had an impact on small workshops. A typical workshop was that of Charles Pace of Westminster, London. Charles Pace with his son Charles Matthew designed many improvements to wind instruments and they exhibited at the Great Exhibition of 1851. In 1841, Pace was employing his two sons and three workmen, who produced instruments using traditional methods. By contrast, in 1879 Boosey & Co. produced 250 bugles and 90 trumpets for a single order with the India Office. Pace and others like him would not be able to compete in this new mass production market. Inexpensive mass production in Asia and Eastern Europe changed the market again and led to the closure in 2005 of Besson (formerly Boosey & Hawkes) in England. In 2006, former Boosey & Hawkes workers opened London Musical Instruments, a small workshop devoted to specialist production of brass band instruments, bringing the instrument making business full circle.

Staff from London Musical Instruments, 2006
Horniman Museum

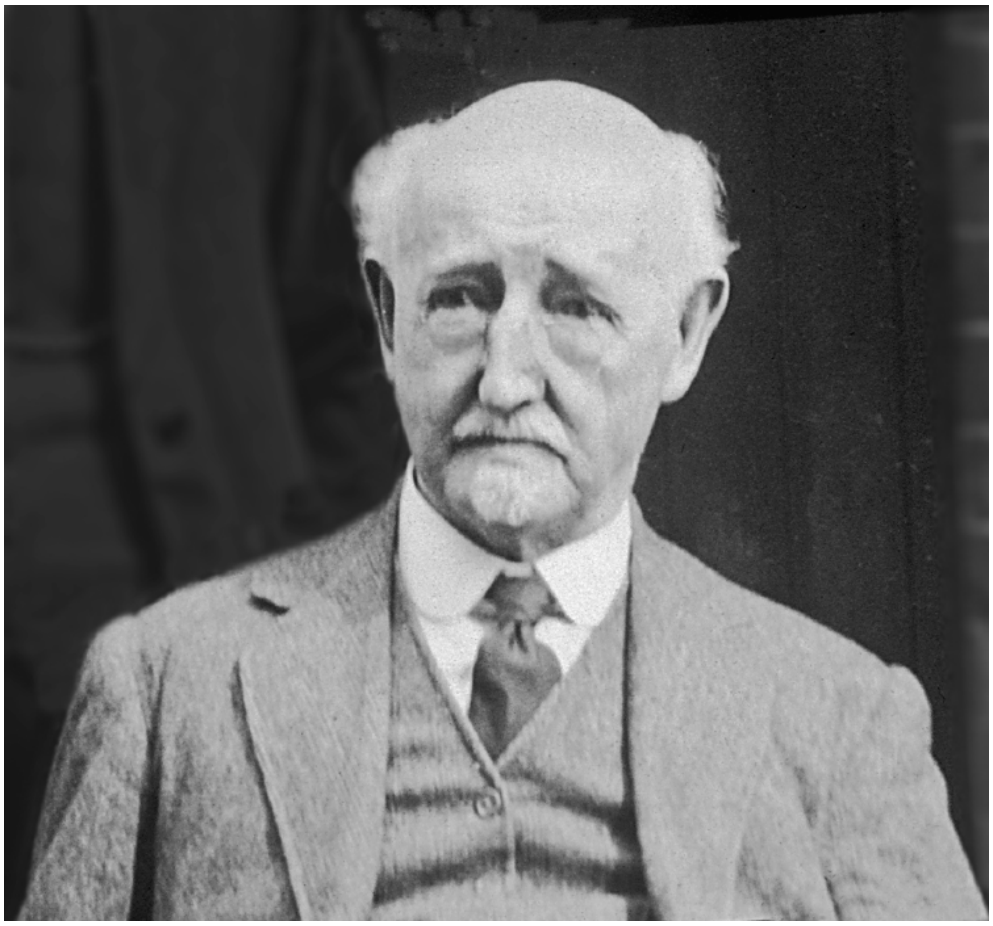
67 **Bugle**, **6 keys**, Charles & Frederick Pace, 2, Crown Street, London, *c.*1820
This bugle is the only surviving instrument from the first workshop set up in 1819 by Charles Pace with his brother Frederick in Crown Street. It has a copper bell and body. The garland and mouthpiece receiver are made of direct method brass, the keyplates and mouthpiece of cementation brass. The rim to the mouthpiece is silver. This bugle illustrates the variety of metals old and new that can be found in an instrument. It highlights the nature of the maker's workshop in the early nineteenth century when scrap metal made of cementation brass was being recycled into new instruments where brass made by the direct method was also used.
1970.274

68 **Cornet, 'Royal' model**, London Musical Instruments, London, 2006
2006
London Musical Instruments was founded by a group of former Boosey & Hawkes instrument makers after the closure of the Boosey & Hawkes/Besson premises in Watford.
E1049

D.J. Blaikley & Brass Instrument Design

The success of Boosey & Co. as instrument makers owned much to the innovative designs and work of David James Blaikley (1846-1936), the son of a portrait painter. Blaikley worked for Boosey from 1859 to 1930, interrupted only by the four years prior to 1868 spent as a railway engineer. He was appointed as works manager soon after Boosey & Co. took over Henry Distin's flourishing band instrument factory in 1868. As factory manager from 1873 to 1918 Blaikley was responsible for many improvements, inventions and the development of new models by Boosey & Co. In his final years with the company he was in charge of research and development. Blaikley was a practical acoustician and gave papers to the Royal Musical Association on pitch, tone, quality and wind instrument design; he contributed to Grove's *Dictionary of Music and Musicians*. His son, Arthur Blaikley, became factory manager in 1918.

D.J. Blaikley's most important contribution to wind instrument design was the development of a successful compensating valve system, which enabled brass instruments to play better in tune. Most valved brass instruments are designed so that the valves act independently of each other: a player can operate more than one valve, each of which lengthens the air column. It was soon recognised that valves which gave good intonation when the valves were operated singly, played sharp when valves were used in combination. Blaikley's compensating systems corrected this weakness and are still in use today for many of the larger brass instruments, such as euphoniums and basses.



David James Blaikley
By kind permission of Richard Smith

D.J. Blaikley & Brass Instrument Design
Object labels

69 **Acoustical investigation showing nodes and antinodes in a Bb valve trombone**, D.J. Blaikley, 1927
Blaikley made important contributions to acoustics, while not neglecting the ‘day job’ of running a factory which employed a considerable workforce. He carried out practical experiments (which involved instruments partly filled with water) to find out where the points of maximum and zero vibration occur in the air column. In a real instrument (with a flaring tube) such as a valve trombone they are not equally spaced. The understanding of the acoustics of wind instruments developed considerably in the 19th century. Innovative makers such as Sax and Besson recognised the potential of scientific methods for instrument design, although the theory necessary for this was not formulated until the 20th century.
E91.127.24

70 **Paper model of 4-valve compensating system**, Boosey & Hawkes, London, 1954
This advertising material cleverly illustrates the system of compensation.

71 **Bb bass trombone, 4-valve compensating**, Boosey & Co., London, 1874
This is the earliest surviving Boosey compensating valve instrument, designed by Blaikley as an experiment. It was displayed in the Royal Military Exhibition of 1890 and was described in C.R. Day's catalogue:`This instrument was designed by Mr D.J. Blaikley and made as an experiment in 1874. The essential difference between the valve system employed, and any other previously designed on a "compensating" principle, lies in the reduction of the number of passages through the valves.' This is the earliest surviving Boosey compensating piston instrument.
2004.1209

72 **Bass saxhorn in Bb, 'equitonique' system**, Gautrot-Marquet, Paris, c.1865
The principle of compensation was introduced and patented by the firm of Gautrot.
EUCHMI 4619 Lent by the University of Edinburgh

73 **Euphonium, 4-valve compensating**, Boosey & Co., London, 1885
Blaikley improved Gautrot's system by shortening the pistons and having one passage through the valves as part of one section of the windway when the valve was not operated and as part of another section of the windway when the valve was operated. This instrument is the second-earliest surviving Boosey compensating piston instrument.
2004.833

74 **C contrabass, 3-valve compensating**, Boosey & Co., London, 1885
Gautrot had effectively patented the 4-valve compensating system. Blaikley's patent of 1878 in fact only covered a reduced version of compensation for 3-valve instruments. This is the third-earliest surviving compensating-piston instrument and the earliest surviving 3-valve compensating instrument.
EUCHMI 4200 Lent by the University of Edinburgh

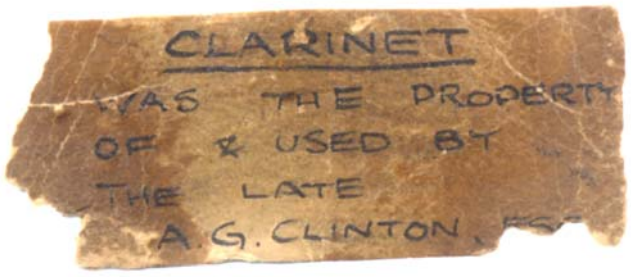
75 **Cornet, 3-valve compensating**, Boosey & Co., London, 1914
Compensating valves were initially applied to all valved instruments, including cornets.
2004.801

76 **Cornet, double principle system**, Boosey & Hawkes, London, 1896
Compensating valves on small instruments have tiny additional loops of tubing, giving problems of manufacture and tight bends. Blaikley reduced these problems with a system that Boosey also called 'compensating pistons' but was actually akin to the valve system used on double horns. Both systems made instruments heavy: the present-day solution to the intonation problem of valve combinations is to have movable valve tuning slides controlled by triggers operated by the left hand.
2004.797

Clarinet design

Woodwind instrument production was a significant part of the output of Boosey & Co. and Boosey & Hawkes. This focused primarily on clarinets and flutes, but all standard members of the woodwind family were manufactured and saxophone production swelled during the 1920s to meet the demands of jazz and dance bands. Bagpipes were made for the military.

Clarinet design was the leading activity of woodwind production at Boosey. This is reflected by the unusual and innovative clarinets collected for the factory's museum. D.J. Blaikley worked on key system improvements and the company employed and collaborated with important designers and performers including Eugené Albert, George Clinton, Manuel Gomez, Geoffrey Acton, Reginald Kell and Jack Brymer. The 1010 model clarinet, with its characteristic large bore and rich sound, defined British clarinet playing during much of the 20th century.



Early collection label attached to Clinton-Boehm system clarinet (77), probably in D.J. Blaikley's hand. Horniman Museum

Clarinet design
Object labels

77 **Bb and A clarinets**, Clinton-Boehm system, Boosey & Co., London, 1904
Owned and played by A.G. Clinton, clarinettist in the Crystal Palace Orchestra and the Philharmonic Society and professor at the Royal Academy of Music. These instruments are made from ebonite, which is a product of the vulcanization of rubber with sulphur. Ebonite was attractive to instrument makers because it was less prone than wood to cracking or warping when exposed to humidity and temperature changes, but over long periods of time ebonite undergoes severe decomposition through the action of air, light and humidity. For this reason, these instruments are displayed in a specially sealed case.
2004.967; 2004.968

78 **Bb clarinet, Gomez-Boehm system with extra keys**, Boosey & Co., London, *c.*1906
Made for Manuel Gomez, clarinettist at Covent Garden and the London Symphony Orchestra and professor at the Guildhall School of Music. The extra keys on this clarinet enabled Gomez to play Bb and A clarinet parts with one instrument. Boosey & Co. marketed a production model of this instrument.
2004.849

79 **Fingering table in Gomez's hand for playing trills on the Gomez-Boehm clarinet**, 1906
E91.150.24

80 **A/Bb clarinet**, James Clinton, London, *c.*1898
The metal sleeve inside the joints of this clarinet was designed to make it playable in Bb or A. The composer Sir Arthur Sullivan was chairman of the Clinton Combination Clarinet Company.
2004.851

81 **Bb and A clarinets, 1010 model**, Boosey & Co., London, 1934
Formerly owned and played by Richard Temple Savage, clarinettist at Covent Garden and by Hale Hambleton, principal clarinettist of the English National Opera and professor at Trinity College of Music.
2006.465

Clarinet manufacture

The most favoured material for clarinet making is wood. African blackwood (*Dalbergia melanoxylon)*, also known as grenadilla, is preferred because it is extremely hard and resists cracking. The wood is cut into billets roughly the length of the clarinet's joints or parts. The billets are first bored to create the internal profile of the instrument and then turned on a lathe to achieve their external shape. These processes, once carried out by hand, are now automated in most factories. The tone holes are then drilled, usually using computer-guided machines. Their placement and diameter is critical to the response and intonation of the instrument. The attachment and fitting of the keys to the instrument, and finishing of the bore and tone holes are delicate jobs that are still carried out largely by hand.

Metal and various rubber and plastic compounds (with proprietary names such as resonite) have also been used to make clarinets. These compounds are virtually unaffected by moisture and temperature changes that cause wood to crack and warp. These compounds are cheaper and are often used for student models and outdoor band instruments, but players generally prefer wood for its feel and sound. Demands on sources of African blackwood are high and conservation programmes are in place. Buffet Crampon have developed a process of recycling scrap material from wooden clarinet making into a wood-based compound that is used in the production of their 'Green Line' clarinets.

Clarinet manufacture
Object labels

All of these parts are made from grenadilla (African blackwood, *Dalbergia melanoxylon*), the preferred material for clarinet making.

82 **Billet for clarinet bell**, Boosey & Hawkes, London, *c*.1950
2004.1053

83 **Billet for clarinet right hand joint**, Boosey & Hawkes, London, *c*.1950
2004.1074

84 **Rough turned and bored clarinet right hand joint**, Boosey & Hawkes, London, *c*.1950
2004.1078

85 **Turned and bored clarinet right hand joint ready for tone hole boring**, Boosey & Hawkes, London, *c*.1950
2004.1077

86 **Clarinet left and right hand joint with tone holes**, Boosey & Hawkes, London, *c*.1950
2004.1080.1-2

87 **Device for measuring tone hole placement on top joint of clarinet in A**, Boosey & Co., 1905
2004.1131

Scrap grenadilla shavings from the Buffet factory floor being prepared for use in the compound used to make ‘Green Line’ clarinets.
Horniman Museum

Bell blanks formed from ‘Green Line’ compound
Horniman Museum

Virtuoso Performances

The 19th century was an extraordinary period for wind instrument design and performance. Players had an unsurpassed choice of instruments, from refined versions of traditional designs to a range of designs with new key and valve systems. Virtuoso performers and instrument makers, who were sometimes one and the same, were influential in determining the type of instruments that were played and that were made by leading English makers. Some worked to develop and promote key and valve systems that laid the foundations for modern wind instrument design, while others refined long-standing technology. These high profile performers and designers helped to establish national preferences for instruments and performance styles.

Virtuoso Performances
Object labels

88 **Clarinet in Bb, 12-key simple system,** Thomas Key, London, *c.*1832
This clarinet was owned by Henry Lazarus, 19th century London's most influential clarinet virtuoso. It is typical of the instruments used by players in the first half of the 19th century.
2004.848

89 **Clarinet in A, Boehm system**, Buffet Crampon, Paris, *c.*1870
This clarinet is stamped with Lazarus's name. Lazarus taught at the Royal Academy of Music and the Royal College of Music. He promoted the Boehm system clarinet to his students and recommended it in his tutor. This is the key system most used by clarinetists in Britain today.
2004.850

90 **Basset horn, Boehm system**, Pask, London, *c.*1860
This instrument is stamped with Lazarus's name. A basset horn is a clarinet pitched between the normal clarinet and the bass clarinet and having an extended length for playing low notes.
2004.1124

91 **Cor anglais, Boehm system**, A. Buffet Jr, Paris, *c.*1880
Formerly belonged to Lavigne. The key system of this instrument, with unusual features such as the Dorus pattern G sharp key, merited its inclusion in the Royal Military Exhibition of 1890.
2004.913

92 **Unmounted body for Boehm system oboe**, anon., *c.*1880
Formerly property of Lavigne. The conical bore enlarges rapidly, and the pad and fingerholes are unusually large. Lent to the Royal Military Exhibition of 1890 by Boosey & Co.
2004.860

Henry Lazarus
Horniman Library

93 **Oboe, modified Boehm system**, Boosey & Co., London, 1860-70
Formerly property of Antoine Lavingne, principle oboist of the Hallé Orchestra in Manchester, who preferred the Boehm system oboe because of its more logical fingering and spent much time working to perfect it. Ultimately, the Boehm system oboe was never widely used in Britain because of its reedy tone.
2004.838

94 **Pastoral oboe, Boehm system**, Triébert, Paris, *c.*1860
Formerly belonged to Lavigne. A pastoral oboe was a small oboe intended for popular music-making, but it failed to establish a permanent niche.
2004.865

95 **Flute, Nicholson's improved system**, Clementi & Co., London, 1820
London flute virtuoso and designer Charles Nicholson dazzled listeners with his powerful tone and his flutes attracted a wide following. Nicholson's playing inspired Theobald Boehm to design his own flute.
2004.1140

96 **Flute, Boehm-inspired key system**, George Card, London, *c.*1840
Orchestral flute player and Royal Academy of Music teacher George Card was an early promoter of Boehm's flute in Britain. However, many players preferred simple system flutes.
2004.1207

97 **Flute**, **Rockstro model, Boehm 1847 system**, Rudall, Carte & Co., London, *c.*1900
Flute virtuoso Richard Rockstro added his own modifications to Boehm's design. The key system and cylindrical bore of the 1847 system flute defined the modern orchestral flute. Players in Britain preferred wooden flutes long after metal ones became popular in France.
1969.632

Trumpets
Object labels

98 **Slide trumpet, Harper's improved model**, Köhler & Son, London, 1871
The Harpers worked with makers such as Köhler to improve the design of the slide trumpet. This instrument belonged to Thomas Harper Junior.
2004.872

99 **2 valve trumpet**, Pace, 49 King Street, London, *c*.1841
Valve trumpets were comparatively rare in Britain when this instrument was made because most players preferred to use the slide trumpet. This instrument, which retains the long shape, pommel, and playing position of the slide trumpet, was an attempt to make valved instruments acceptable within the tradition of natural and slide trumpets. The bell and tubing is made of direct method brass. The garland and ferrules are of paktong (early Chinese nickel brass).
2004.1208

100 **Double slide trumpet**, Courtois & Mille, Paris, *c*.1890
The double fold of this trumpet's slide enabled it to play more notes.
2004.871

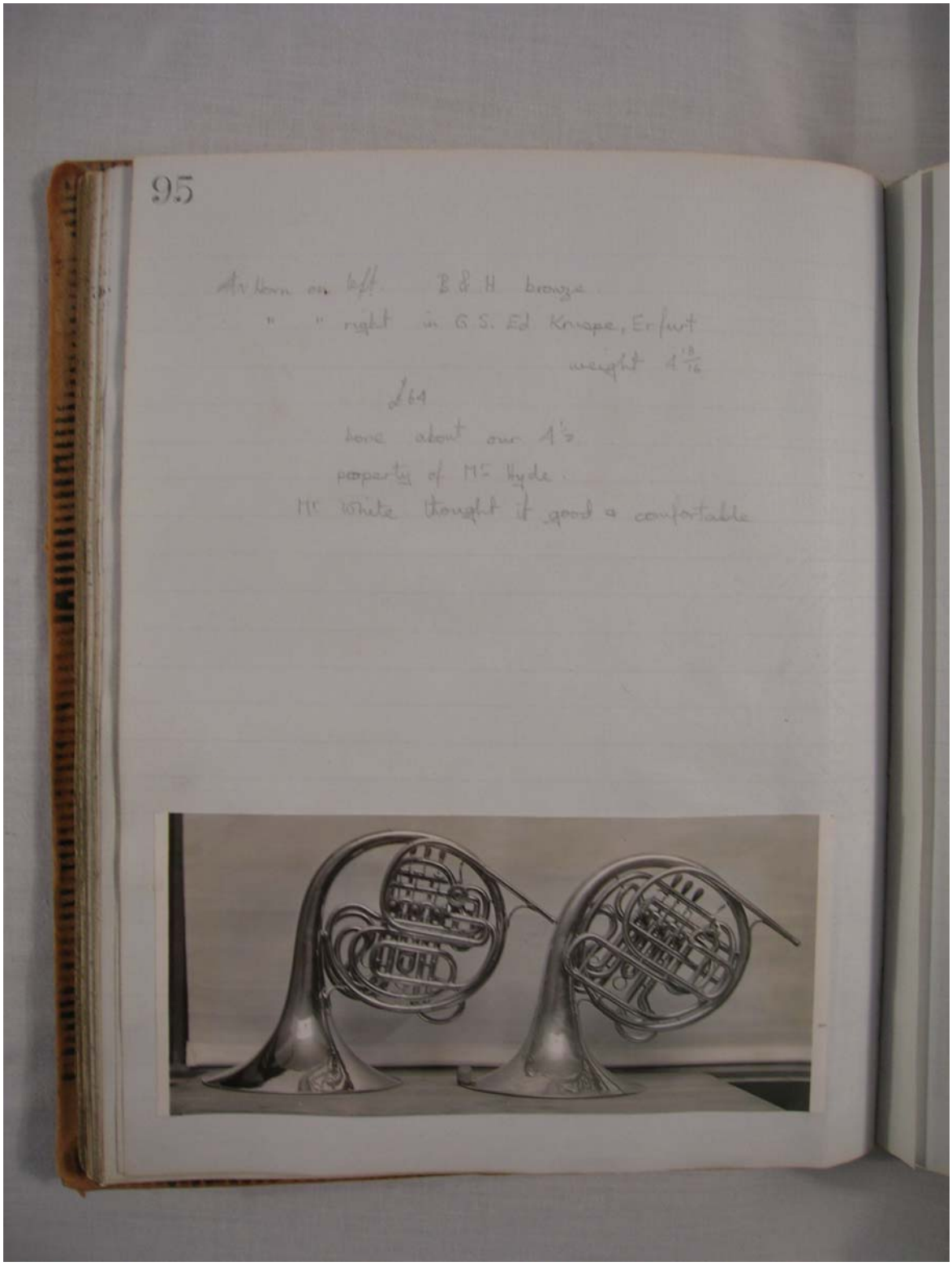
101 **Slide trumpet**, Boosey & Co., London, 1886
Although the valve was patented in 1817, the slide trumpet remained popular in Britain throughout much of the 19th century largely because it was the instrument used and promoted by the father and son trumpet virtuosos Thomas Harper senior and Junior.
M40-1983

Thomas Harper Junior
Adam Carse Archive, Horniman Library

Winds of Change

During the second half of the 19th century, a distinctive style, or 'school', of playing was established in Britain. British orchestras had their own unique sound. The instruments chosen by players were an important part of establishing this style. The wind section of British orchestras and bands looked and sounded different, particularly from those in Germany and America. Brass instruments tended to have small bores and produced a bright and transparent sound. The French narrow bore bassoon was favoured, as were the wooden flute (also more prevalent in Germany) and wide bore clarinets.

In the early 20th century, British orchestras began to tour internationally and German and American orchestras visited Britain. British players and conductors keen to emulate the bigger and darker sound of these orchestras began to experiment with German and American instruments. Boosey, Hawkes and other English makers responded by producing their own versions of these instruments. World War II accelerated the travel of musicians and instruments. Soon after the end of the war, most wind players throughout Europe and the US used similar instruments and the distinctive national schools were supplanted by a homogeneous sound.



Page from a scrapbook of brass instrument photos kept by D.J. Blaikley, c. 1930, showing a German horn made by Kruspe (on right) and a horn designed by Boosey & Hawkes to compete with these instruments.
Boosey & Hawkes Archive, Horniman Library

Winds of Change
Object labels

102 **Plan, horn**, Hawkes & Son, London, *c.*1920

103 **Horn, 2 Périnet valves**, Boosey & Co., London, 1910
French-style narrow bore horns were preferred in England from the mid 19th to the mid 20th century. Like the French, the British delayed using valves on the horn. This two-valve instrument shows that players continued to use their hand in the bell to produce different notes much later than players in Germany.
2004.1191

104 **Horn, 3 Périnet valves**, Hawkes & Son, London, 1915
This narrow bore, piston valve horn with detachable crooks was the type of horn used by three generations of the Brain family. Its distinctive sound and technique, reaching its highest level with Dennis Brain, represented the most characteristic period of horn playing in England.
2002.5

105 **Double horn in F/Bb, 3 rotary valves and piston change valve**, Hawkes & Son, London, *c.*1930
This instrument was an attempt to combine the French-style narrow bore prized by British players with the greater flexibility and security of the German double horn layout. However, the instrument suffered from poor tone quality and intonation.
2004.820

106 **Double horn in F/Bb**, Paxman, London, 1988
This horn, typical of those used by British players today, follows the layout and bore profile of German double horns.
M37-1992

107 **F Trumpet**, Boosey & Co., London, *c.*1922
This trumpet, with its unshortened form built in the key of F, echoes the layout of the slide trumpet that it replaced, and was used in Britain during the first decades of the 20th century.
EUCHMI 2513 Lent by the University of Edinburgh

108 **Trumpet in Bb, Grisha Farfel 'Sessionair' model,** Boosey & Hawkes, London, 1963
This trumpet was targeted at jazz players and modelled after American instruments. This model was endorsed by Grisha Farfel, whose name is engraved on the edge of the bell. Farfel became famous playing with the Billy Cotton Band during the 1950s.
2004.1210

109 **Trumpet in Bb, 'Imperial' model**, Boosey & Hawkes, London, 1955
With factory guarantee card and prospectus. The Bb trumpet was more agile than the F trumpet and its larger bore helped it to compete with the large bore trombones and horns that became popular in Britain in the 1930s and 40s. This trumpet was the property of William John Mansfield BA of Southerness, Scotland and was donated to the Horniman Museum in his memory.
E1008

H.G. Hambleton with narrow bore piston valve horn, late 19th century
By kind permission of Hale Hambleton

Trombones
Object labels

110 **G bass trombone**, Boosey & Co., London, 1899
British brass bands, military bands and orchestras have a standard complement of two tenor and one bass trombone. From the 1830s until *c*.1950 the bass trombone used in Britain and other countries that adopted British traditions was pitched in G. The long slide requires a handle to reach the further positions: this looks cumbersome but in fact is well adapted to a fluent technique.
EUCHMI 2731 Lent by the University of Edinburgh

111 **Bb tenor trombone, 'Imperial' model**, Boosey & Hawkes, London, 1958
With the influence of international playing styles, bands and orchestras changed to wider bore instruments after World War II. From today's perspective these are seen as transitional instruments of medium bore. This particular trombone was played in the City of Edinburgh Band, a championship brass band.
EUCHMI 3839 Lent by the University of Edinburgh

112 **G+D bass trombone**, Boosey & Hawkes, London, 1932
The G bass trombone lacks the lowest notes available to the earlier F bass trombones. Adding a thumb valve not only extends the range but also increases agility by reducing slide movement. This was the first G+D trombone made by Boosey & Hawkes. These instruments were called 'Betty Model' in the company's books after noted orchestral trombonist William Betty. D+G trombones were produced until the 1950s and were used in some brass bands in the 1970s before they, like orchestras, changed to the wide bore Bb+F bass trombone.
2004.1171

113 Bb tenor trombone, 'Artists Truline' model, with alternative tuning slide for low pitch, Boosey & Hawkes, London, 1933

The British trombone sound from *c.*1850 to *c.*1950 was determined by the French model trombone, used in bands and orchestras. Its light, bright sound lent itself to an agile performing style. These instruments are now disparagingly called 'peashooters' because of their narrow bores, but Elgar and Holst (who played the trombone) had no problem exploiting their qualities. The playing pitch of British orchestras was lowered around 1900, but the pitch of brass bands remained high until *c.*1970: this instrument made in 1933 is equipped with separate tuning-slides for band and orchestral use.

EUCHMI 2496 Lent by the University of Edinburgh

114 Bb tenor trombone, 'Sovereign' model, Boosey & Hawkes, London, 1981

With the threat of loss of sales to importers of American wide-bore trombones, Boosey and Hawkes introduced their 'Sovereign' trombone in 1971. It is virtually a copy of the widely admired American Conn '8H' model. This instrument is displayed with a Denis Wick mouthpiece. Wick, a leading London trombonist, worked with Boosey & Hawkes to develop the Sovereign model trombone and produces a range of custom designed brass mouthpieces and mutes.

EUCHMI 4665 Lent by the University of Edinburgh

Leading London trombonist George Case with ‘peashooter’ trombone, late 19th century
Adam Carse Archive, Horniman Library

Basses, tubas, bassoons
Object labels

115 **Bassoon, French system**, Hawkes & Son, London, *c.*1930
Late 19th and early 20th century English makers patterned their bassoons after French instruments, which were characterised by their narrow bores. These instruments, along with 'French scrape' reeds, imparted a bright, nasal sound to British wind sections.
14.5.47/31

116 **Bassoon, German system**, Boosey & Hawkes, London, 1935
Hans Richter helped to introduce the German Heckel bassoon to Britain by bringing a pair of Viennese players to the Hallé Orchestra in Manchester in 1899. The German Bassoon was slowly adopted by English players as the demand for a more powerful and louder wind sound increased. This bassoon was used professionally by Michael Whewell in the Bournemouth Municipal Orchestra and elsewhere.
EUCHMI 2790 Lent by the University of Edinburgh

117 **F tuba**, Besson & Co., London, *c.*1931
The EEb bass is often used as an orchestral tuba, but from the 1890s until after World War II an F tuba was considered the proper orchestral instrument. This model with five valves but not compensation was known as the 'Barlow tuba' after the leading British tuba player of the early 20th century, Harry Barlow. This instrument belonged to orchestral player Vic Saywell and may have sounded the well-known signature tune of the radio series 'Hancock's Half Hour'.
EUCHMI 4048 Lent by the University of Edinburgh

118 **Bombardon or EEb bass, 'Imperial' model',** Boosey & Co., London, 1923-4
The 'Imperial' model basses were designed by D.J. Blaikley and introduced by 1911. The designation 'EEb' used in bands denotes a wide bore Eb instrument. This design has proved extremely successful, and was produced by Boosey & Hawkes (later Besson) until production in Britain ceased in 2005. The later 'Sovereign' instruments had wider mouthpiece receivers and bell flares, but the core of the instrument was unchanged from Blaikley's design. This particular bass was used in the City of Edinburgh Band, a championship brass band.
EUCHMI 4550 Lent by the University of Edinburgh

Chorley Subscription Silver Band playing typical brass band instruments of the late 19th century.
By kind permission of Bradley Strauchen