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Trombone

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Trombone

(Fr., It. *trombone*; Ger. *Posaune*).

A brass lip-reed aerophone with a predominantly cylindrical bore. The most common trombones are the tenor and bass counterparts of the trumpet. In its most familiar form the trombone is characterized by a telescopic slide with which the player varies the length of the tube; hence the term 'slide trombone' (Fr. *trombone à coulisse*, Ger. *Zugposaune*, It. *trombone a tiro*; Fr. and Eng. up to the 18th century, *saqueboute*, sackbut). Both the Italian and German names for trombone are derived from terms for trumpet: *trombone* (large trumpet) from the Italian *tromba* (trumpet), and *Posaune* from *Buzûne*, derived in turn from the French *buisine* (straight trumpet). The etymology of *saqueboute* is discussed in §7 below. See also [ORGAN STOP](#) (*Posaune*).

1. Slide trombone.

The structure of a slide trombone can be seen in fig.1a [not available online]. The two parallel inner tubes of the slide are connected at their upper ends by a cross-stay. The mouthpiece is inserted into the top of one tube; the bell joint fits on to the top of the other, the tube being either tapered externally or attached to the bell by means of a threaded collar (the 'bell lock'). Over the stationary inner tubes runs the slide proper, which consists of two tubes joined at the bottom by a U-tube known as the 'slide bow' (with a water key for releasing condensed moisture) and at the top by a second cross-stay, which the player holds with the right hand. Friction is minimized by slightly thickening the walls of the lowest 120 mm of the inner tubes to provide running surfaces for the outer slide. Formerly these short sleeves or 'stockings' were of a different metal (such as phosphor bronze) from that of the slide; in modern manufacture they are formed integrally with the inner tubes, which are of chromium-plated nickel silver. The bore of the modern instrument is cylindrical for about half its length (more with the slide extended), the cylindrical section usually between 12.5 mm and 14.0 mm in diameter, although in bass trombones it may exceed 14 mm. A wide variety of bore sizes is produced by the larger manufacturers, and players select the most appropriate for the repertory and their own characteristics. The bore expands to a markedly flaring bell of brass, occasionally silver, with a terminal diameter ranging from about 20 cm across on a tenor trombone to about 25 cm on a bass. The U-bend of the bell section (the 'bell bow') is usually fitted with a tuning-slide and may include a weight to balance the whole instrument in the player's left hand.

In each position of the slide, a series of resonances approximating to a harmonic series is available to the player. Modern slide technique is based on seven positions that lower the pitch of all members of this series progressively by semitones ([Table 1](#)); the 1st (highest) position is with the slide fully retracted, the 7th (lowest) with it fully extended. The distance between adjacent positions increases as the slide is extended. On the tenor trombone, for instance, from 1st to 2nd position is about 8 cm, from 6th to 7th position about 12 cm. A slide allowing lowering by six semitones gives a complete chromatic compass from the second-lowest available note in 7th position (*E* on the tenor trombone in *B*) upwards for some three octaves, more or less, depending on the skill and needs of the player.

TABLE 1

Slide Position	1st	2nd	3rd	4th	5th	6th	7th
12							
11							
10							
9							
8							
7							
6							
5							
4							
3							
2							
1	B \flat	A	A \flat	G	(G \flat)	(F \sharp)	(E \flat)

The modern tenor and bass trombones stand in 9' B \flat ' (length of tubing, with the slide retracted, 9 feet). Some tenors and most basses are B \flat /F trombones, which incorporate in the bell section a valve which, when operated, extends the tube length to lower the basic pitch of the instrument by a perfect 4th to 12' F (The 'F attachment'; fig.1b [not available online]). The practice of using B \flat and B \flat /F trombones has almost done away with what survived in the 20th century of the traditional use of three different sizes of slide trombone: alto, tenor and bass. The B \flat trombone, however, is still often called a 'tenor trombone'. Wide-bore models of the B \flat /F trombone are often termed 'bass trombone', and are used for the lowest of the three trombone parts that have normally been written in orchestral and band music (fig.1c [not available online]). The E \flat alto trombone is used in parts written for it; many players, however, use a tenor trombone to play alto parts. The trombone is a non-transposing instrument except for tenor trombones in the British-style brass band, where the parts are written in the treble clef a major 9th higher than they sound.

The second leg (leading to the joint) of the trombone's slide is sometimes of slightly wider diameter than the first (leading from the mouthpiece receiver); such a model is termed 'dual bore'. In any case, the high proportion of cylindrical tube (even with the slide retracted) acoustically determines the tonal character of the trombone. In order to bring the modes of vibration of the air column into a usefully close approximation to a harmonic series, there has to be a significantly high 'horn function', given by a flaring bore profile, over the last foot or so of the bell. Even so the frequencies of the lowest one or two modes are markedly lower than the nominal frequencies of the corresponding notes available to the player: one can only sound the lowest ('pedal') and next lowest resonances in tune because of the presence of an extensive series of strong higher modes allowing a 'cooperative regime'. Compared with other brass instruments of comparable tube length and tessitura such as the euphonium, the strong higher modes of vibration (resulting from the more cylindrical bore) and the greater acoustical energy trapped in the instrument by the flaring bell of the trombone give the instrument a more brilliant character, especially when played loudly. It has recently been suggested (Hirschberg and others, 1996) that the energy levels in a trombone can be so high that they display non-linear (shock-wave) characteristics; this is probably responsible for the non-harmonic 'tearing of linen sheets' effect when the trombone is played at maximum volume (see [ACOUSTICS, §IV, 4–5](#)).

A variety of mouthpiece designs have been used for the trombone. Few early mouthpieces have survived, but the earliest models seem to have been larger versions of the trumpet mouthpiece with hemispherical cup shape, a sharp-edged throat and a flat rim. The 19th-century French trombone mouthpiece was a large version of the horn mouthpiece, with a deep funnel-shaped cup. The modern trombone mouthpiece is of intermediate cup shape and a larger cup volume to match the large bore of modern instruments.

The mutes commonly used with the trombone are the straight mute (today often of curved profile rather than a truncated cone) – this is the mute used in parts marked *con sordini* without further qualification – and the cup mute; these are positioned by strips of cork allowing the air to pass between mute and bell. Some mutes, such as the 'harmon' or wah-wah mute and the practice mute, fit tightly to the bell and have a central air passage. Other mutes are loosely attached, hand-held or attached to a music stand; these include the bucket and 'derby' or hat mutes (see [MUTE](#)).

Anthony C. Baines/Arnold Myers

2. Tenor trombone.

The tenor trombone in A, B \flat or C has always been the most common; in 16th-century Germany, for instance, it was often termed *gemeine* ('ordinary'), and the deeper-pitched instruments (*Quartposaune* etc.) were described by their pitch interval below the tenor. **Table 1** shows how the scale is made on the tenor trombone. The lowest available note in each position (the 'pedals') was not written for until Berlioz, and these notes even at the end of the 20th century were to some extent treated as a special effect. The lower pedals are, with a normal mouthpiece, difficult to produce. Although one talks loosely of the slide having seven positions, for sustained notes fine adjustment of slide position is needed to produce good intonation, and intermediate positions are required for quarter-tones. In fast passages, the slide is hardly stationary in any position. Higher in the range, extended positions of the slide are used primarily as alternatives to avoid long shifts in fast passages and to allow variation in making slurs for legato playing. Alternative positions are also often needed for the first or last note of long glissandos.

Anthony C. Baines/Arnold Myers

3. Bass trombone.

The F bass trombone formerly used in German and central European bands barely survived into the 20th century. In Britain, however, the G bass trombone, pitched a minor 3rd below the B \flat instrument, was used in every orchestra and band from about 1815 up to the 1950s and still appears in some brass bands. Its lowest note, apart from pedals, is C \sharp ; in the orchestra a D valve was used. Because of the long slide extensions necessary on F and G trombones, the stay of the outer slide is provided with a handle, needed to reach the lowest positions.

The B \flat /F trombone was introduced in 1839 by the Leipzig maker C.F. Sattler; in Paris Halary and Sax followed with similar instruments, though they were little used in France. The B \flat /F instrument was at first regarded as a 'tenor-bass trombone', capable of covering the compasses of both bass and tenor, rather than a replacement for the true bass in F. With the valve operated, the slide has only six positions, and the scale of the trombone is thus extended down to C, the lowest note in classical bass trombone parts. The F valve also provides further alternative positions to avoid shifts to the slide that are awkward on the B \flat trombone: for example the semitone from B \flat to B, 1st to 7th position, is reduced to 1st to 2nd position, allowing the progression to be played legato, if the B is taken with the valve operated. B' is missing altogether as the instrument lacks the 7th position. Composers such as Bartók and Stravinsky who have included this B' in important works have obliged players to use an extended tuning-slide in the valve loop, putting the instrument into E, or a bass trombone with two valves. Many bass trombones now have a second valve lowering the basic pitch by a 2nd or a 3rd (fig.1c [not available online]) which gives further alternative positions as well as a complete compass down to E' or lower so that the instrument can also play contrabass trombone parts, e.g. those of the *Ring*.

During the second half of the 19th century it became regular practice in German orchestras for the second and third players to use B \flat /F trombones (with a wider-bore instrument for the third part), while the first used the B \flat instrument. This practice has been extended to the USA and to other European countries. For some repertory, the second or even the first player in a section of three will prefer a B /F instrument, although where a valve is less useful many players prefer to use the B trombone, which is lighter and usually freer-blowing. The 'stiffness' caused by the conventional rotary valve in trombones led at the end of the 20th century to the introduction of valve designs with gentler bends in the windways; these valves are of necessity bulky and some incorporate valve designs tried and abandoned in the 19th century, but they do provide an instrument on which the response of both valved and unvalved notes is good.

Anthony C. Baines/Arnold Myers

4. Contrabass trombone.

For a long time many opera houses possessed a true contrabass trombone in 18' $B\flat$ ", provided with a double slide consisting of two parallel slides connected in series (by two U-bows at the base and one at the top) but moved as one (fig.2a [not available online]). As each shift on such an instrument requires half the movement necessary with a normal slide, the shifts are no greater than those of the ordinary $B\flat$ trombone. Double slides were also fitted to some F trombones. Boosey & Co. made a trombone in 16' C' for the London première of the *Ring*; as its double slide provided nine positions instead of the usual seven, Wagner's E' could be reached on it. According to Arthur Falkner, however, it failed to earn Hans Richter's approval and the part was played on a tuba.

A contrabass in 12' F' or $E\flat$ ' with two valves has been used in Germany, particularly a model introduced by Ernst Dehmel of Berlin in 1921 and used at the Bayreuth Festival of 1924 (fig.2b [not available online]); this was modified by Hans Kunitz in 1959 as the 'Cimbasso' model, in which one valve lowers the instrument to 16' C', the other to D, and both together lower the pitch to 18' $B\flat$ ". **CIMBASSO** when it means a trombone denotes a four-valve contrabass in 18' $B\flat$ ". An instrument of this kind is required for the lowest trombone parts in the late works of Verdi and the operas of Puccini. It is also used in the larger Italian wind bands.

Anthony C. Baines/Arnold Myers

5. Alto and soprano trombones.

Alto trombones in $E\flat$ or F, commonly used from the 16th century to the 18th as the top voice in the brass choir (see fig.6 below), declined in popularity from the early 19th century, when trombones became an established part of the symphony orchestra. The range of the parts can usually be covered with the $B\flat$ instrument; furthermore, players have become accustomed to the $B\flat$ trombone's slide shifts and mouthpiece, and some prefer its sound to the brighter, thinner tone of the alto. (Indeed, even in the 17th century Praetorius recommended using the tenor instead of the alto.) Although some first trombone players have always used the alto in parts so marked, its use was unfashionable from the mid-19th century to the mid-20th. Several 20th-century works require the alto, for example Berg's *Wozzeck* and Britten's *The Burning Fiery Furnace*, and at the end of the 20th century it was more frequently used for classical parts than a generation earlier.

The soprano trombone, usually in $B\flat$ an octave above the tenor, seems to have appeared in the late 17th century, the period from which the earliest surviving specimens date. It was used in Germany to play the treble part in chorales, and this tradition survives in the Moravian trombone choir at Bethlehem, Pennsylvania. In the 20th century several manufacturers made soprano trombones as doubling instruments for jazz cornet players, or as a novelty, but the instrument has never been widely used. It lacks its own character and the short shifts make it difficult to play in tune.

Anthony C. Baines/Arnold Myers

6. Valve trombone.

Although Heinrich Stölzel, co-inventor of the valve, had considered its application to the trombone, the first valve trombones were produced during the 1820s in Vienna by other makers, employing the double-piston valve (the double-piston valve trombone survived until the second half of the 20th century in Belgium as the *trombone Belge*). Made in alto, tenor and bass pitches, valve

trombones reached a peak of popularity soon after the mid-19th century. In 1890, according to Constant Pierre, German and Italian orchestras almost always used a valved bass trombone, and until the mid-20th century valve trombones (often alongside slide trombones) were common in bands and theatre orchestras in the Latin countries, eastern Europe and Asia. Most valve trombones have kept the basic shape of the slide trombone, although in 'short' models the length is considerably reduced. From about 1840 instruments intended for mounted and marching bands were produced in various upright (tuba) and circular (helicon) designs. Among these was the *Armeeposaune* (Ger.: 'army trombone') invented by V.F. Červeny of Hradek Králové in 1867; it had rotary valves and came in several sizes, from alto in F to contrabass in B \flat .

Tenor and bass instruments are frequently fitted with a fourth valve that, as on other four-valved brass instruments, lowers the pitch by a 4th; but as three valves remain tuned to the B \flat pitch, use of the fourth valve adds intonation difficulties to those inherent in the standard three-valve system. The constant need to correct intonation by embouchure and the stuffiness resulting from tight bends in the windway are shortcomings of the valve trombone. Advantages are greater technical flexibility (e.g. on certain trills), compactness, and the fact that every instrument from alto to contrabass has the same fingering pattern as other brass instruments.

A valve arrangement that offers better intonation is Sax's system of six independent pistons, used for many years in Belgium. Each valve controls a loop giving a total tube length matching a given shift on a slide; when operated, a valve diverts the windway through its own loop, cutting off all those below it. The main windway leads through all the valves to a terminal loop and back through the valves to the bell. The first valve corresponds to the 1st position, the sixth to the 6th position; without any valve operated the instrument gives the notes of the 7th position. No combinations of valves are required (unless an extra valve is fitted to serve as the fourth valve of a normal valved instrument).

Anthony C. Baines/Arnold Myers

7. History to c1750.

The early history of the trombone was misunderstood in Britain until the end of the 19th century. Burney appears to have believed it to be an entirely new instrument when players of the 'Sacbut – or Double Trumpet' were sought for the 1784 Handel Commemoration, and many 19th-century antiquarians thought that it had origins in deep antiquity. The source of the latter misconception was the appearance of the word 'sackbut' in the Old Testament (*Daniel* iii. 3, 5, 7 and 10); Francis W. Galpin's monumental paper 'The Sackbut: its Evolution and History' (1906–7) showed this to be no more than a translator's error. The translators of the Geneva Bible (1560) had encountered the word *sambuca* (meaning a type of harp) in a passage that clearly referred to musical instruments and erroneously concluded that it described an instrument with which they were familiar in the 16th century. The error was repeated in the 1611 Authorized and the 1885 Revised versions. Galpin correctly showed that the trombone, an instrument with a double, U-shaped slide, can be dated no earlier than the 15th century, though neither he nor any subsequent scholar has been able to establish exactly when and where it first appeared.

The instrument has always been called *trombone* in Italy and *Posaune* in German-speaking countries: both are terms derived from words meaning 'trumpet'. Other commonly used names for the early trombone are uncertain in origin, but appear to be a combination of two elements: *sac* (perhaps from the Spanish word *sacar*, a word with several different meanings, the most likely in this context being 'to draw' in the sense of pulling); and *bu* (meaning to thrust or push, and probably deriving from the Teutonic *boten*). These combined to become *saquebote* (French), *sacabuche* (Spanish) and *sackbut* (English), each of which appeared in several different spellings in the 16th and 17th centuries. In England for example, 'sagbut', 'shakbush' and 'shagbut' were as common as 'sackbut'. This group of words is important to scholars: from the time that they began to be applied to a musical instrument they seem to describe it as having a movable slide. The same could not be said of *trombone* and *Posaune*, since in the 15th century these words could equally have meant a form of large trumpet without a slide. Other words meaning trombone in the 16th century were *dracht* (*draught*, *draucht*) *trumpet* and *tuba ductilis*.

'Dracht trumpet' occurs in a number of Scottish sources from the late 15th century and the early 16th. In describing a wedding reception of 1538, Robert Lindsay distinguished between the 'weir trumpattis' and the 'draught trumpattis' (*The History and Cronicles of Scotland*, ed. Ae.J.G. Mackay (Edinburgh, 1899), i, 379), implying that the latter was different from the former and that it had some sort of slide. At this late date it was almost certainly a double slide instrument. *Tuba ductilis* seems to have been the commonly accepted Latin expression for the trombone from the 16th century onwards. For example, an early 16th-century warrant in the Scottish Privy Seal Records which registered the appointment of a 'draucht trumpet' player Julian Drummond specifies his office as that of 'tuba ductilis'. Elyot's Latin–English Dictionary (*Bibliotheca Eliotae*, 1538) translated 'Tuba ductilis' as 'a brazen trumpet', but elsewhere this phrase was consistently associated with the trombone. Praetorius used it, as did Roger North and Giles Schondonch, the author of 'The Custom Book of St Omer', an early 17th-century manual describing practices at the English Jesuit school at Saint-Omer, France, (MS, c1609, Stonyhurst College, Lancs. Arch. CII 19), who provided the unambiguous explanation 'Tuba ductilis (vulgo Sacbottum)'.

Most scholars believe that the immediate precursor of the trombone was the instrument now referred to as the 'Renaissance slide trumpet'. This instrument had a single telescopic slide which enabled the player to produce notes approximating to those of a harmonic series on each of three or four semitone-adjacent slide positions. No such instruments survive, but the case for their existence – based primarily on iconographic sources, but also on some documentary and musical evidence – seems compelling (see [SLIDE TRUMPET](#)). Although no direct relationship between the slide trumpet and the trombone has been established, a progression from the former to the latter seems probable since both instruments seem to have been prevalent in the same regions – Germany, the Low Countries and Italy. Keith McGavan has offered the view that the double slide instrument, because of its modular construction, could also be adapted into a single slide instrument. It is likely that Germany, where there were established centres of brass instrument making by the mid-15th century, was the source of the design and manufacturing techniques of these instruments. From northern Europe the trombone spread to other regions: by the end of the century, German and Flemish players were prominent in several parts of Europe: the first named trombone players associated with the English court, for example, were Hans Broen and Hans Nagle, the latter having originated in Leipzig.



(a) Earliest known trombone, a tenor in B \flat by Erasmus...

The earliest detailed depiction of a trombone appears in Filippino Lippi's fresco *The Assumption of the Virgin* (1488–93) in S Maria sopra Minerva, Rome. From that time to the end of the 16th century – to the extent that sources allow such generalities to be drawn – most instruments were broadly similar. A drawing of a trombone in Virdung's *Musica getutscht* (1511) shows characteristics typical of other representations and of surviving specimens. The earliest surviving trombone, by Erasmus Schnitzer of Nuremberg, is dated 1551 ([fig.5a](#)). While several early trombones are no longer in their original state, a comparison of the morphology of extant instruments presents a fairly consistent picture: the instruments have a narrow

internal bore diameter; the tubing is cylindrical apart from the length between the final bend (in the bell section) and the bell end, which flares gently, expanding to a significantly smaller final bell diameter than with the modern trombone. H.G. Fischer compared the measurements of 22 such instruments (Fischer, 1984), and found that, though there was some inconsistency among instruments, the tube bore of most was about 10 mm in diameter, and the bell diameters were seldom more than 10.5 cm. Another feature common to such instruments is the thinness of the metal walls. The bore of early trombones closely matched that of contemporary trumpets. The inner tubes of the slides had a consistent external diameter: they did not have 'stockings' (expansions at the open end of the inner slides intended to minimize friction). There was no water key to allow for the disposal of moisture accumulated from condensation of the player's breath.

The drawings of trombones in Praetorius's *Theatrum instrumentorum* (1620) are the earliest which provide any reliable and accurate iconographical detail, and the information is broadly consistent with what we can observe in specimens of the period (though it is unlikely that any surviving trombone dating from before the 18th century is completely intact). The instruments described by Praetorius had most of the principal features that were to characterize all trombones until the 19th century. Crooks and other devices for tuning and changing pitch were already in use at the start of the 17th century. A reference in the 1541 letters of the Nuremberg maker Georg

Neuschel to an order which included two 'bogen' for the 'quintposane' has been taken, probably correctly, by A.C. Baines (see [CROOK](#)), to mean that crooks were already being used on trombones at this early date. Praetorius's drawings show *Krumbbügel auf ein ganz Ton* for the tenor instrument, and the bass instruments have a tuning slide on the bend of the bell section operated by a long rod extending forward. This would have been used to change the overall pitch of the instrument rather than for moving from one note to another. Other means of changing the overall pitch were a coiled crook fitted between the bell section and the slide section (Mersenne (1636–7) illustrates an instrument crooked down a 4th in this way) and straight extensions at the same point, some possibly in the form of one or more tapered 'bits'. The earliest surviving instruments have loose-fitting stays held together by metal clasps, sometimes ornate and sometimes lined with leather, on both the bell and slide sections. From the second half of the 17th century, makers fitted tubular stays on the slide section, making the right hand grip of the slide more comfortable and flexible. The slide-stays on some instruments were in two parts, one fitted rigidly to each leg of the slide, joined telescopically in the middle; such a device would also have facilitated an easy slide action. Illustrations of 17th- and 18th-century trombone players show differences in the way that the instrument was held, but an engraving by J.C. Weigel (*Musicalisches Theatrum*, c1722) shows the player holding the instrument in a similar way to that used today. Bass instruments had a handle fitted to the stay of the outer (movable) slide section so that players could reach the furthest positions. H.G. Fischer has suggested that such devices were also sometimes fitted to tenor instruments if the player's arm was too short to reach the outer positions. Both of the latest 17th-century English depictions of trombonists (a drawing of a waits band attributed to Marcellus Lauron the elder ([GB-Cmc](#)) and an anonymous painting of a trombonist on a 17th-century organ case) show the players holding such handles: this suggests that it was the bass instrument which lasted longest in England in the 17th century.

Very few early mouthpieces survive; perhaps the most important is one inscribed with the mark of the Schnitzer family, who made trombones in Nuremberg in the 16th century. This mouthpiece is important because it accompanies an extant instrument, which carries the same mark and is dated 1581. Like the representations of mouthpieces in treatises such as Mersenne's *Harmonie universelle* (1636–7), which it resembles, it suggests that mouthpieces tended to have flat rims, shallow cups and sharp, well-defined apertures. But there is insufficient detailed evidence to show that all mouthpieces followed a broadly consistent, let alone identical, pattern.



Trombones were made in several sizes ([fig.6](#)). Praetorius's description of the names and pitches of different sizes is open to interpretation (see Myers, 1995), but he gives for the alto, tenor, bass and contra/double bass trombones the following nominal pitches:

Alto	(Hör oder Haupt Bassen)	B or E
Tenor	(Gemeine oder Bassen)	A
Bass	(Nieder-Bass oder Bass-Bass)	F and D
Double Bass	(Gross-Bass)	A two octaves below C

Trombones illustrated by Praetorius in 'Theatrum instrumentorum' (1619): (from left...

The labelling of the tenor instrument as 'gemeine' (common or ordinary) suggests that this size of instrument had the widest utility, and this indeed seems to have been the case. The bass was also widely used, but the alto less so, particularly outside Germanic countries. The soprano trombone, which was introduced towards the end of the 17th century, was not widely popular, but Moravians who settled in North America used it on the chorales.

The way in which early trombone players produced notes was broadly similar to that used by modern players, as were the basic mechanics of the instruments, but the sound and style they employed – the idiom of the early instruments – was markedly different from that which began to develop in the late 18th century. The idiom of the early instruments was influenced by the technical features of the instruments themselves, the musical and cultural contexts in which they were employed, and other pragmatic considerations, particularly the physical environments in which they were played.

The earliest source to provide explicit, diagrammatic evidence about trombone slide positions is Aurelio Virgiliano's *Il dolce melo* (c1600). Virgiliano's drawings are consistent with other sources

up to the end of the 18th century in showing that trombone players recognized four slide positions (modern players use seven). The first of the four was likely to have been sounded not with the slide closed, but with it slightly extended, allowing the player to sharpen and flatten notes to bring them in tune. As there was no secondary tuning slide, the main slide (perhaps assisted by some 'lipping') was also used to adjust the overall pitch of the instrument. The recognition of four rather than seven slide positions is consistent with the view that early players thought in diatonic rather than chromatic terms: while the seven modern positions are a semitone apart, the four associated with the early trombone were diatonic, with additional semitones treated as adjustments between them.

The best modern reproductions replicate not only the measurements of early specimens, but also the manufacturing processes by which they were made. Such instruments provide an insight into the world of early players, and allow scholars to make sense of primary-source evidence. They show that early trombones were versatile: not only could they be played in a number of settings, but they were able to produce two distinct types of sound. When these instruments are blown loudly, the sound is brassy and strident. The abundant references to trombones being combined with shawms and trumpets for fanfares and other loud outdoor music suggest that they were often heard in this mode (for further [not available online] see [ALTA \(I\)](#)). Mersenne commented that this type of trombone playing was 'deemed vicious and unsuitable for concerts', but (although his utterances are not without ambiguity in this respect) he had probably heard instruments played in this way. However, modern reproductions show that early trombones were easy to play quietly; when played in this manner they produce a restrained, suave, clearly focussed sound, capable of subtle articulation and inflection, that even remains focussed in the lively acoustics of a church. It is this mode of expression that was the most common in the 16th and 17th centuries. The sound is well matched with that of the cornett: a partnership between the two instruments was established by the early part of the 16th century and continued until the closing decades of the 17th. The two instruments were superbly suited; they had wide and complementary pitch compasses, and broad dynamic and expressive ranges. They were natural accompanists for choral music, and players of them were employed in ecclesiastical foundations across Europe (see [CHORUS \(I\)](#), [not available online]). While trombonists were employed with cornett players in court, church and civic ensembles, single instruments were also used in broken consorts. Praetorius's observation that the English had a predilection for a single quiet trombone (*eine stille Posaune*) in consort music is confirmed by other sources, and many pictorial representations show trombones in the company of various wind and string instruments. Praetorius and Mersenne recognized the trombone as one of the instruments on which it was possible and appropriate to play diminutions and other decorations. Because many trombonists also played other instruments, it is likely that the majority were not only technically capable of playing such embellishments, but had a fine sense of what was tasteful and appropriate. Some players were famous for their virtuosity: Praetorius wrote of 'the famed Phileno of Munich', and the Italian Lorenzo da Lucca was said to have had 'in his playing a certain grace and lightness with a manner so pleasing' as to leave his listeners 'dumbstruck' (Haar, 1988, p.64).

Although trombones were used by European courts and ecclesiastical foundations from the middle of the 15th century onwards, their entry into different musical centres was not simultaneous. The earliest recorded use of trombones in England does not occur until 1495, and regular wages were not paid to players until some time later. The first record of the use of a trombone by an English civic authority appears in 1526, when the Court of Aldermen of the City of London sanctioned the purchase of an instrument for their waits. In Spain, trumpets, shawms and trombones (*trompetas, é chirimias, é sacabuches*) were employed to play at the baptism of Prince Juan, the son of Ferdinand and Isabella, in 1478, but it was not until 1526 that trombonists were given regular employment at Seville Cathedral. However, from the opening decades of the 16th century until the closing years of the 17th, the trombone was one of the most prominent professional instruments. There are few labelled trombone parts in 16th-century musical sources, but contextual evidence is so plentiful that it is easy to deduce the types of circumstance in which the instruments were used. Trombonists were regular members of *Stadtpfeifer*, *piffari*, waits and other town groups, and of church ensembles. However, regional differences did occur. For example, in England, where there were up to 12 trombonists in receipt of wages from the court in the 16th century (the arrival of the Bassano family swelled the numbers in the 1530s), there is no evidence of them being used for liturgical music before the second half of that century, and even though the ensemble of cornetts and sackbuts was ubiquitous in Europe, only two English sources – John Adson's *Courtly Masquing Ayres* (1621) and Matthew Locke's *Music 'ffor*

His Majesty's Sagbutts and Cornetts (1661) – specify this ensemble alone. However, other pieces such as Charles Coleman's *5 Partt things ffor the Cornetts* (1661) provide compelling evidence that this grouping may also have widely been used in England. In the late 16th century and the 17th it became more common for a group of trombones to be used in ensembles to produce a heterogeneous block of sonority. Some of the *cori spezzati* effects which Andrea and Giovanni Gabrieli seem to specify for the Venetian players exploit this idiomatic feature, and similar sonorities dominate the trombone writing of Heinrich Schütz, the marvellously sculptured writing in *Fili mi Absalon* (*Symphoniae sacrae*, 1629) being a superb example. It is probably from this type of sonority rather than from the sound of the single instrument that the symbolic association of trombones with death, the underworld and other dark features of the emotional spectrum derives; while it is difficult to determine the exact point from which such meanings originate, it is certain that these associations were well understood by the start of the 17th century. Monteverdi's dramatic use of a large trombone ensemble in *Orfeo* seems to follow an established convention, and similar passages are found, for example, in the music for the Florentine *intermedi* performed for the Medici wedding celebrations of 1589. This symbolism seems to have been understood elsewhere as well: a stage direction for the first performance in London of Beaumont and Fletcher's *The Mad Lover* (1616) calls for 'A dead march within, of Drums and Sagbutts'.

A small repertory for solo trombone survives from the 17th century, including a piece called 'La Hieronyma' (*Musicali melodiae*, 1621) by G.M. Cesare (himself a trombonist), and another by Francesco Rognoni Taeggio, who includes in his book of divisions, *Selva de varii passaggi* (1620), a piece with the rubric 'per il violone over trombone alla bastarda'. But towards the end of the 17th century, the trombone began to fall out of use in many European centres where it had been an established feature of musical life for almost two centuries. The evidence for this descent is quite unambiguous: records show a decline and then a halt in payments to players who had regularly received them. The same types of source also show that players who had long been associated with the trombone were transferred to other instruments. In England the decline was particularly complete: not a shred of evidence suggests that there was a single native-born trombone player in the country for the entire 18th century, and an inventory of goods at Canterbury Cathedral refers to a chest in which are kept 'two brass Sackbutts not us'd for a grete number of years past'. Trombones were used for the first performances of Handel's *Israel in Egypt* and *Saul* in 1739, but they must have been played by foreigners. Their use a few years later at a benefit for the trumpeter Valentine Snow was deemed sufficiently unusual to be featured in advertisements. When they were reintroduced for the 1784 Handel Commemoration, a member of the audience annotated his programme with the observation that they looked something like 'bassoons with an end like a large speaking trumpet'.

There are several reasons why the instrument fell from use. The most obvious is a change in taste which favoured more homogeneous sonorities, particularly after the fashion of the string orchestra of the French court. Another is the decline in the practice of doubling vocal lines with cornetts and trombones; because this was a primary function of the instrument, trombones were less needed when that practice became less favoured. In Austria, however, the practice of doubling vocal lines with trombones survived. As late as 1790 Albrechtsberger complained of 'trombones written in unison with alto, tenor or bass voice'. It was in Austria and Germany, especially in Vienna, that the trombone survived as a church and theatre instrument. Many sacred choral works contain trombone obbligatos, and there is a small but attractive solo repertory. It is no accident that it was here, in the hands of Gluck and Mozart, that the earliest developments of the modern idiom took place.

Trevor Herbert

8. History from c1750.

In the mid-18th century the trombone was still used principally in church music (particularly for doubling the lower voices) and in small ensembles: it did not become a part of the orchestra until the late 18th century. The instrument maintained strong associations with the underworld or the supernatural. The use of a trio of trombones – alto, tenor and bass – appears to date from the beginning of the modern phase of trombone usage in the late 18th century, when the instrument

was increasingly used in orchestral and band music. The widespread use of the trombone is a result of the burgeoning of wind bands and brass bands in the mid-19th century in towns, villages and workplaces all over Europe and North America. Gluck wrote for a trio of alto, tenor and bass (e.g. in the oracle scene of *Alceste*), as did Gossec, who also scored for a single trombone joined to a bass part. Mozart used trombones only in his operas and sacred works; his dramatic use of the instrument is particularly well exemplified by the supper scene of *Don Giovanni*, and he provided a notorious solo for the instrument in the 'Tuba mirum' of the Requiem (not without precedent in his earlier church music). In Germany the reorganization of military bands gave the trombone the role of strengthening the bass line, although the trio was maintained in large infantry bands as well as in the orchestra.

Romantic composers considered the trombone capable of expressing a broad range of emotional situations; Berlioz said the instrument possessed 'both nobleness and grandeur' and had 'all the deep and powerful accents of high musical poetry, from the religious accent, calm and imposing ... to wild clamours of the orgy'. He included an impressive solo in his *Symphonie funèbre et triomphale*. According to Algernon Rose (*Talks with Bandsmen*, 1895) trombonists' propensity for playing too loudly was the reason one conductor, about 1850, employed trombones designed with the bell pointing back over the shoulder. Over-the-shoulder trombones were also used in at least one American band (the Boston Brass Band) to match the design of the other instruments, which were all over-the-shoulder models. 19th-century composers often limited themselves to a stereotyped usage of the trombone for reinforcements of tutti passages and for background harmonies in soft passages; because of the preponderance of 19th-century music in 20th-century concert programmes, it is with these least interesting sides of the trombone's character that audiences are most familiar. In the dance band music of the first half of the 20th century, however, arrangers made liberal use of the trombone's inimitable cantabile, which dance band trombonists execute so well they are sometimes credited with having discovered new techniques. Other technical developments have been largely due to the influence of jazz musicians (see for example [KID ORY](#), [TOMMY DORSEY](#) and [J.J. JOHNSON](#)). Jazz trombonists have explored the expressive potential of irregular attacks, glissandos, microtones, a wide variety of mutes and (particularly the German virtuoso Albert Mangelsdorff) multiphonics of up to four distinct pitches, revealing that a greater range of timbres is available than is usually employed even by modern symphonic composers. Vibrato – always a technical possibility – has become part of the trombone soloist's style; it can be made with the slide, the embouchure, or the diaphragm. Slide technique has become more flexible, and the instrument's range has been extended at both ends, making the feasible range of the tenor trombone from *E'*, the lowest pedal note, to *g''* or above.

Although the trombone is now seldom heard in the concert hall as a solo instrument apart from jazz, several 19th-century players made reputations as soloists, including C.T. Queisser and F.A. Belcke in Germany, and in France A.G. Dieppo.

The developing use of the trombone from about 1750 was accompanied by changes in design. The concept of the tenor instrument standing in A with a 'floating' first position and four diatonic slide positions gradually gave way to the perception of the instrument as standing in *B \flat* with seven chromatic slide positions. The earliest known source to treat this disposition as normal is André Braun's *Gamme et méthode pour les trombones* (c1795). The large basses in *E \flat* and D tended to give way to the more manageable basses in F and G with seven positions on the slide. Around the turn of the century, the flat stay on the bell section was replaced by a tubular stay, facilitating the modern mode of holding the instrument, with several fingers curled around the stay. The expansion in bore from the joint through the bell bow to the bell tube is much more pronounced in the later models, which considerably influences the tone and increases the volume at which the instrument can be played. Also important in determining the quality of the sound is the degree of flare in the bell over the last foot or so of the air column – the last inch or two being probably less important than the region a little way into the bell (which is where most of the sound energy is reflected back towards the mouthpiece). By the end of the 19th century nearly all trombones were equipped with slide stockings, a tuning-slide and a water key. In the modern trombone there is a 'tapered leadpipe': a subtle shaping of the first few inches of the tubing (inside the downward leg of the inner slide) which gives a gradual transition from the narrowest part of the bore (inside the mouthpiece) into the cylindrical bore of the slide. This has the effect of making notes speak more readily.

From the early years of the 19th century, when the instrument became far more popular and its manufacture more widely distributed, distinct models developed. In Germany the bore increased from an average (for the tenor) of 11 mm around 1800 to 13 or even 14 mm by about 1840. The flare of the bell was increased in acuity and was continued to a termination of wide diameter. This enlargement of the trombone's bore and bell size (and increase in power) is usually credited to the Leipzig maker C.F. Sattler, and its adoption to Wagner during his period at Dresden. The tubular slide stays, consisting of two sections, one end of each fixed to the limb of the slide and the other ends resting one inside the other in a loose fit to provide flexibility, have been continued on some German trombones until the present day. German trombones of the late 19th century and the early 20th often carried a traditional embellishment of a pair of snakes disporting themselves on the bell bow.

The use of large-bore tenors and basses in B \flat /F became general in military bands after 1850 and such instruments were used in the orchestra for the later works of Wagner, Brahms, Bruckner and Richard Strauss. In the early 20th century some British players changed to instruments of wider bore for this repertory and at the end of the century some changed from their normal American-model trombones to German instruments for the music of these composers.

In France subtle changes were made to the bell flare to create an instrument capable of playing louder without increasing the bore of the slide, which remained at around 11 mm or even less. This model seems to have been developed by François Riedloker towards the end of the 18th century and later modified by Courtois and others. Braun described the bass as the principal member of the family, merely providing fingering charts for the tenor and the alto. While his alto is an instrument in E \flat , the tenor is distinguished from the bass only by its use of the tenor clef and its avoidance of the lowest notes: both parts were taken by trombones in 9' B \flat , presumably with a larger mouthpiece for the bass. The true bass and alto sizes were a rarity in France in the 19th century; the tenor was not infrequently pitched in C.

The German model seems to have been favoured in Britain early in the 19th century, the French from mid-19th to mid-20th century. The traditional complement was a set of alto, tenor and bass, disposed either in F, C and G or in E \flat , B \flat and F. The trombone was virtually unused in Britain during most of the 18th century, but in the first quarter of the 19th it returned to fashion, frequently with a forceful style of playing which gave it associations that are only being thrown off at the end of the 20th century, but no doubt appealing to many band members and bandmasters. The alto, capable of less volume than the tenor and bass, and not as full in tone as valved french horns, does not appear to have been much used after the 1860s. The bass in G), more manageable than that in F, had a particular appeal to players in Britain; it was as numerous in early bands as the tenor trombone and also became the standard bass trombone in the orchestra.

The wide-bore German model was further refined in the USA to produce the modern trombone, sonorous in *forte* but perhaps lacking in character in *pianissimo*. The American instrument (fig. 1a), with its good intonation and lightweight outer slide (essential on a wide-bore instrument) is used and copied worldwide. The higher dynamic level in late 20th-century bands and orchestras (to the detriment of some aspects of tone quality and balance), was largely the result of the power of the trombones combined with the desire of brass players to be audible above the rest of the ensemble.

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