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Bassoon

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Bassoon

(Fr. *basson*; Ger. *Fagott*; It. *fagotto*).

A wooden conical wind instrument, sounded with a double reed, which forms the tenor and bass to the woodwind section. In the modern orchestra, the family exists in two different sizes: the bassoon and the double bassoon or contrabassoon, sounding one octave lower. Built in four joints, its precursor the dulcian was of one-piece construction. Because of its wide compass and its range of characteristic tone-colours, from richly sonorous at the bottom to expressively plaintive at the top, it is one of the most versatile and useful members of the orchestra. Certain design features are peculiar to it: the doubling back on itself of the bore, like a hairpin; the 'extension bore' beyond the sixth finger-hole; and local wall thickness allowing for finger-hole chimneys. These features give the instrument its essential tone qualities and condition its complex acoustics. The standard compass of the present-day bassoon is from *Bb*' to *f*' or *g*'. It is a non-transposing instrument and its music is notated in the bass and tenor clefs; occasionally the treble clef is also used.

In the Hornbostel-Sachs classification it is classified as an oboe.

See also [ORGAN STOP](#).

1. The modern instrument and reed.



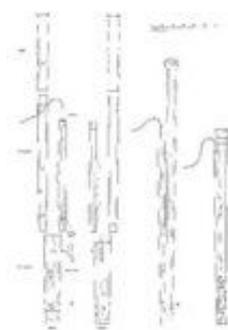
Modern bassoons: (a) German system, by Wilhelm Heckel, Biebrich; (b)...

The modern bassoon exists in two versions: the German or 'Heckel' system, and the French or 'Buffet' system of differing keywork and slightly modified bore ([fig.1](#)). As the German type is more commonly used today, it provides the frame of reference for general statements here about the construction of the modern bassoon.

While early bassoons (like dulcians: see §2) were sometimes made of harder varieties of wood, maple has been the wood traditionally used. Carl Almenraeder (see §4) favoured North American dark maple (*acer nigrum*), considering harder varieties to be unsuitable because they produced a duller tone, while softer varieties, although giving a better tone, were less durable. Most German makers preferred the medium-hard flamed or curly ring maple to the harder and heavier grenadilla or palissander (Brazilian rosewood) more often used by the French. The last serious attempt to make the body out of metal was by Lecomte, and was exhibited in Paris in 1889. However, ebonite has since been used in England for military instruments destined for the tropics. German bassoons today are made of sycamore maple (*acer pseudoplatanus*; Ger. *Bergahorn*). In America they are also made of local sugar maple (*acer saccharum*), though plastics such as polypropylene are successfully used as an alternative to wood. Before World War II the wood was customarily seasoned for up to 12 years, and machined only in gradual

stages; now modern drying processes are used and the wood is often impregnated under pressure to stabilize its inner structure.

The machining of the bore and tone holes needs to be done with the utmost precision to achieve a good instrument. Final tuning has to be done by hand and calls for considerable time and skill. The crook is a crucially important element which needs to be carefully matched with its instrument. These factors make the bassoon traditionally more expensive than other wind instruments.



(a) Diagram of a modern German bassoon showing the joints...

The bassoon stands about 134 cm tall and consists of four wooden joints together with a metal crook and reed ([fig.2a](#)). The total length of the bore is about 254 cm, flaring from a width of 4 mm at the narrow end of the crook to 39 mm at the bell. The components are:

(a) The tenor or wing joint, named after the projecting 'épaule' (a part of the wall thickened to accommodate three obliquely drilled finger-holes); this joint has a protective lining of hard rubber or plastic.

(b) The double or butt (boot) joint, which contains two continuously flaring bores connected at the bottom by a metal U-bend bow, which is screwed on to the body and protected by a metal cap. The narrower of these two bores is also lined for protection against water. A 'crutch' or hand rest to support the right hand is usually fitted to this joint.

(c) The long joint or bass joint, which lies adjacent to the wing joint.

(d) The bell joint, usually with a decorative outer profile and often tipped with an ornamental rim of ivory or plastic. A longer bell for the A' was first demanded by Wagner in *Tristan und Isolde* (1865); followed by Liszt, Strauss, Mahler, Delius, Nielsen, Schoenberg and Stravinsky among others. It is generally found to have a detrimental effect on playing characteristics.

(e) The crook or bocal which is inserted into the upper end of the wing: a tapering metal tube with a nipple perforated by a pinhole near the wider end; the reed is placed at the other end. The crook is usually bent into a characteristically curved 'S', but this shape is sometimes altered to suit individual players. Crooks are built in different lengths to assist tuning.

When played, the bassoon is held obliquely across the body. Its considerable weight is supported by means of a neck strap or shoulder harness attached to a ring on the butt, a seat strap or adjustable spike attached to the bottom of the butt, or a leg support fitted to the top of the butt. The left hand is held uppermost: raising the three middle fingers of each hand produces a basic scale of G to f. With the help of the crook- and other register-holes these overblow an octave higher. The other fingers control keys which extend the range down to B \flat . This considerable extra length of 'resonator' is an important factor in the acoustics of the bassoon, as are the wall thickness, which produces chimneys of significant length on the wing joint, and the relatively small size of finger-holes. (For a fuller discussion of acoustics see Benade (1976) and Krüger (*MGG2*); see also [ACOUSTICS, §IV, 6.](#))

The fingerings of the upper register are complicated: above c'' the notes become somewhat more difficult to produce, requiring a progressive increase of wind pressure. While the French instrument with its slightly narrower bore and different layout of tone holes is able to reach e'' and f'' without undue difficulty, these notes are less easy on the German bassoon, though extra keys are now available to facilitate them.

Response and intonation is greatly affected by comparatively minute deviations in the conicity of the bore. In recent years makers have devoted great efforts to designing a more evenly-scaled instrument. Luckily the degree of pitch alteration available to the player through regulating air support and embouchure is comparatively great, and players often use individual fingerings to

'humour' certain notes. A new bassoon requires 'playing in' and thus players are hesitant to change their instruments. The problem of playing softly is sometimes assisted by the use of a mute; this can take the form either of a piece of cloth stuffed in the bell (e.g. as demanded by Ligeti) or of a short sleeve-like metal cylinder (see [MUTE](#)). Many players (especially in the USA) take great pains to seal every trace of porosity in pads and body to facilitate response.

In London there have been two efforts made in the late 20th century to reform the instrument. The 'Logical Bassoon' of Giles Brindley employed an electronic circuit to open and close the tone holes, thereby simplifying the fingering whilst making possible ideal combinations of holes for each note (Brindley, 1968). Edgar Brown's promising experimental bassoon, developed in collaboration with the bassoonist Zoltan Lukacs (1936–91), is built to a design by the distinguished acoustician Arthur Benade (1925–87); in the interests of greater tonal homogeneity, 'the hole proportions are such as to give a uniform tone-holes lattice cut-off frequency' (Brown, 1998).



Modern bassoons: (a) German system, by Wilhelm Heckel, Biebrich; (b)...

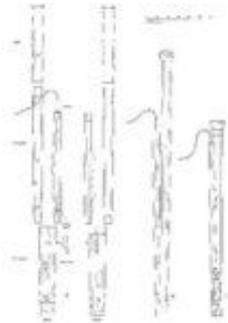
The French bassoon differs from the German in bore, disposition of tone holes and system of keywork (see [fig.1](#)). In general it has retained the basic design of the early bassoon, in contrast to the reformed Almenraeder instrument with its low-register open holes enlarged, increased in number and placed further down the bore. Formerly in common use throughout the non-German-speaking world, it has since the 1930s been replaced by the German model. There is controversy over their respective merits – the light, free tone quality of the French contrasts with the dark homogeneousness of the German. However, much depends on the style of playing and of the reed chosen by the individual player. In general the German instrument may be considered 'safer' and easier to control for the

player.

Like the oboe, the bassoon uses a double reed (see [fig.11d](#) below) made of a type of bamboo cane (*arundo donax*), of which the most suitable quality grows in the Var district of southern France. Cane from Italy, America, southern Russia and China is also used by local players. The modern method of manufacture is as follows: a piece of tube 12 to 14 cm long and about 2.5 cm in diameter is split vertically into three or four pieces and the inside of each planed to the desired thickness by a gouging machine; on the outside the 'bark', except on the top and bottom quarters of the length, is removed to a contoured bevel by a 'profiler'. The piece is then folded to half its length, cut to size in a metal 'shaper', formed on a mandrel and bound with three wires and thread; lastly the tip of the fold is cut off. The final thinning of the reed blades may be done with a tip profiling machine, or with a file and scraping knife. The reed is very fragile and sensitive (the blade tip is only some 0.1 mm thick) and plays a crucial role in the tone and response of the instrument. Both the quality of the cane and the contour of blade thickness are very important. Recent research by Heinrich (1987), subjecting reed cane to analysis under laboratory conditions, has yielded new insights into the behaviour of what he defines as a *bilâme hydrique* (bilaminate reacting variously to water), and the interaction of the banding wires with cane density. Reeds for the German instrument differ from those traditionally used on the French in the way they are finished; 'French' reeds are usually bevelled evenly like a chisel while the 'German' scrape leaves a thicker spine down the centre. There is considerable divergence of style and scrape between players. Formerly made exclusively by hand, nowadays reed manufacture has become increasingly mechanized. Various experiments have been made with plastic reeds, but so far they have not proved suitable for professional use.

At times the bassoon has been played with a clarinet-type mouthpiece. According to *GerberL* the clarinetist J.W. Hesse attempted to do this in 1786, and in England small bassoon mouthpieces from the early 19th century have survived. They have never been used seriously because of the way they denature the tone, although they were formerly used for tuning instruments. They are still marketed in the USA.

2. The dulcian and other precursors.



(a) Diagram of a modern German bassoon showing the joints...

The early history of the bassoon is obscure: few early specimens survive and it is not possible to be sure when and where these were made. Iconographic evidence, though sparse, is more trustworthy than that from written documents, which, because of ambiguities of nomenclature, must be interpreted with caution. In general, two successive versions of the instrument may be distinguished: the earlier, in use up to the beginning of the 18th century (though later in Spain), was essentially in one piece and is best labelled 'dulcian' (fig.2c) to distinguish it from the later 'bassoon' proper (i.e. in four joints). Although one early specimen in Vienna (a 16th-century Italian instrument by HIER.S, refurbished during the Baroque era) is inscribed 'DER. DULCIN. BIN. ICH. GENANT ...' the names given to the instrument in early times were, unfortunately, seldom consistent or unambiguous. Derivatives of at least four different names have been in use since early times, 'Fagott' and 'curtal' as well as 'dulcian' and 'bassoon' (also 'tarot' and 'szort'). Since, of all the derivatives of these names, 'dulcian' has arguably been the least ambiguous, this is the preferred terminology.

The first term originated in 14th-century France as 'fagot', meaning a bundle of sticks, a faggot. While also used as the name of a dance by Phalèse (i) (1549) and Susato (1551), it was first used to denote a musical instrument in the early 16th century in Italy. 'Choristfagott' was an early name for the dulcian, and the name 'Fagott' was applied in the 17th century to the bass pommer as well, in spite of the fact that neither resembled a bundle of sticks. From the mid-18th century onwards *Fagott* and *fagotto* have been respectively the German and Italian names for the bassoon. The name 'dulcian' is commonly used today for the original version of the instrument in one piece (as opposed to the later type in joints). Deriving from the Latin root *dulc* (soft, sweet), it has traditionally been held to refer to the instrument's more subdued tone quality than that of the louder shawms and pommers. However, Klitz (1971) showed that forms like *dulzan* can refer to the pommer as well as to an earlier type of shawm called the 'dolzaina' (*douçaine*). In England the earliest name for the dulcian was 'curtall', which was used well into the 18th century for the bassoon as well, and is related to other wind instrument names such as the French *courtaud* and the German *Kortholt*, which all derive from the Latin *curtus* (short), referring to instruments shortened because of their folded bore. 'Basson' meant originally the bass-register version of an instrument (e.g. *basson de hautbois*, *basson-flûte*). In 18th-century Germany it became the name of the new jointed version of the dulcian, which had been developed in France. In England, Talbot's manuscript made a similar distinction: 'Basson has 4 Joynts, Fagot entire'. Purcell's *Dioclesian* score of 1690 specified 'bassoon' and this anglicized version of the word has been used ever since.



Early form of dulcian: detail of an alabaster relief by...

With the rise of instrumental playing in the 16th century, the desire to extend the range of instruments into the lower register caused them to be developed in families: larger versions of the shawm and recorder were made possible by an improved technology which enabled makers to bore longer tubes and to control widely spaced extension holes with the aid of keys. As Kolneder (*MGG1*) showed, there must have been a demand in the 16th century for a deep instrument to form a bass to the wind band that would surpass the trombone in agility, the bass recorder in loudness, and the bass pommer in ease of handling. Early in the 16th century all the constructional elements of the dulcian would have been available: the double reed of the shawm, the curved crook of the bass recorder and bass shawm, and the doubling back on itself of the bore (within a single block of wood) of the phagotus.

The shawm had already been built in large versions which were known as 'bomharten' or 'pommers': it may be assumed that the largest of those made in Nuremberg by Sigmund Schnitzer the elder and described by Johannes Apel in a letter of 1535 as 'vill höher und lenger den ich' (i.e. 'much taller than I') was already like the largest pommer illustrated by Praetorius in 1620. It must have been a cumbersome instrument to manage, especially out of doors.

The first mention of the dulcian in a reference work is in Zacconi's *Prattica di musica* (1592); Virdung (1511), Agricola (1529, 5/1545) and Luscinius (1536) made no reference to it. Zacconi wrote that 'the Fagotto chorista has a range C-b. It is so called because there is another kind which is not of its pitch but either a little higher or lower'. Sachs derived 'chorista' from the

instrument's usual function of supporting the bass in choral music; however this term was applied to other instruments as well to mean a certain register or **PITCH** level, for example 'Dui corneti, uno di ton chorista, et uno più basso' (Accademia Filarmonica inventory, Verona, 1562).

Of these different types, the *Choristfagott* soon established itself as the most useful member of the family. It consisted of a single shaft of wood (maple or fruit), oval in section, nearly a metre tall, drilled with two bores connected at the bottom so as to form one continuous, conical tube. At the top a curved brass crook was inserted into the narrow end of the bore, and the other end was slightly extended to form a flared bell. This bell sometimes took the form of a perforated cap, thus making the instrument *gedackt* (i.e. covered) as opposed to *offen*, and doubtless affecting both the tone quality and pitch. The thickness of the walls enabled the finger-holes to be drilled obliquely to accommodate the span of the fingers. There were eight finger-holes and two open keys protected by perforated brass boxes: six fingers gave G, and by adding the keys and using the player's thumbs, notes down to C could be played. The basic scale overblew the octave, giving a range up to about *g'*. The 'swallow-tail' end of the little-finger key allowed the player to hold the instrument on either side of his body with right or left hand uppermost. Sometimes, especially in the larger sizes, the body of the instrument was made in two half-lengths, or even in three sections, which were joined together under an ornamental band, as in figs.4 and 5 below.

Over 50 dulcians of various sizes datable to the 16th and 17th centuries are in museums at Vienna (10); Berlin, Brussels (7); Augsburg, Linz (6); Frankfurt, Nuremberg, Salzburg (4); Brunswick, Leipzig, Merano, Sondershausen (2); Barcelona, Dresden, Hamburg, Paris, Prague (1). Of those in Vienna, eight come from the famous collections of Catajo and Ambras and include several of the earliest dulcians known. The four signed by J.C. Denner (*d* 1707) may be presumed to be among the last non-Spanish examples made. Sachs was the first to dispute the traditional view that the dulcian was a development of the pommer. That the two instruments coexisted for some time is shown in the paintings of a wind band by Alslot (in the Prado, Madrid; see **SHAWM**, §3, [not available online]) and Sallaert (in Galleria Sabauda, Turin). The Nuremberg Stadt

Where, when and how the dulcian evolved is unknown, there being insufficient evidence to allow tidy conclusions to be drawn. The sparse evidence available shows different forms appearing in different places and at different times. Lockwood's researches (1985) into the Ferrara *guardaroba* archives of Willaert's patron Cardinal Ippolito I d'Este reveal that as early as 1516 the musician Gerardo *francese*, in the cardinal's service since 1504, was paid for 'uno fagotto da sonare cum le chiave d'argento' and identified that year as a 'sonator de fagoth'. There is a further reference to payments in 1517 'per fagotto che sona Janes de pre Michele', evidently a colleague. The following year we find the lutenist Giovanni Angelo Testagrossa in a letter written to Isabella d'Este at Mantua, offering instruments and referring to 'un altro instrumento quale se chiama un fagot' (Bertolotti, 1890). The phagotum, demonstrated in 1532 at the court of Mantua by its inventor Afranio degli Albonesi and described in 1539 by his nephew Teseo Ambrosio, was traditionally considered to have been the earliest ancestor of the bassoon on the strength of its name; however, with its bellows-blown pair of twin cylindrical bores (each called a *fagoto*) sounded by single metal reeds, it is rather a type of bagpipe. The next earliest Italian citation is from the Verona Accademia Filarmonica *Libro degli atti* of 1546 which mentions 'il 9 maggio furono comperati da Alvise soldato un Fagotto ed una Dolzana'.

Of all the signatures known on early wind instruments, variants of **HIER.S** (25; see **HIER.S**) and of the so-called 'rabbits foot' (about 143) by far predominate. An attractive theory links both to the Bassano workshop. Significant research by Lasocki and others has revealed much concerning the activities in both Venice and London by members of this remarkable family. He has identified three generations of makers and players descended from Jeronimo (i) (*d* ?1539), a native of Bassano, some 65 km north-west of Venice. By 1531 four of his sons had visited London in their capacity as sackbut players, where they settled by about 1538. Both they and two subsequent generations were active there and in Venice making and repairing instruments. It is most likely that the eight surviving dulcians signed 'HIER.S' and 'HIERO.S' may be products of the Bassano workshop – the instrument depicted by Castiglione shows a two-section dulcian made in a similar style – as are also the eight others bearing the 'rabbit's foot' mark.

In Germanic countries references appear somewhat later. A Graz inventory of 1577 lists 'a set of old, bad [or plain] fagati, 2 bass, 2 tenor and 1 descant' and '1 good fagat in daily use'; from this,

Kolneder deduced that they were at least 40 to 50 years old, setting the time of their introduction in Graz at about 1530. In Augsburg, where a unique set of six (made in Italy) survive, they were first listed in 1566.



Early form of dulcian: detail of an alabaster relief by...

Nickel argued that in Nuremberg the instrument did not make an appearance until 1575, when a *dulzin* (here meaning dulcian) was procured from Antwerp: earlier references elsewhere to *dulzana*, *doltzana* and the like refer to the *dolzaina*, an instrument in common use since the 15th century; and the *fagati* of Augsburg and Graz, he suggested, were pommers. Neudörfer (1547) praised the

Nuremberg maker Sigmund Schnitzer the younger (d 1578) for his ability to turn, tune and perform on large oversized *Pfeiffen*, which Doppelmayer (1730) called *Fagotte*. That this might refer to a *Grossbasspommer*, rather than a dulcian, is supported by the fact that the player Rosenkron who was engraved holding one in 1679 is called *fagotist*. In view of these verbal ambiguities, pictorial sources are more reliable. A relief carved in Antwerp by Antonius von Zerun for the Moritz monument erected in 1563 in Freiberg Cathedral (Lower Saxony) shows a dulcian among a group of wind instruments (see [fig.3](#)); the instrument is portrayed again in an engraved frontispiece by Collaert of about 1590 (reproduced in Fraenkel, no.39). These and other sources suggest that it appeared early in Flanders. Venice was also supplying instruments to courts in Germany and Austria in the late 16th century (in 1588 the Munich Hofkapelle acquired 'ein Vagott von Venedig'); in Nuremberg, the leading centre of wind instrument making of the period, the first dulcian was made in 1595.

By the time of Praetorius, the family had reached its maximum extent: in *Syntagma musicum*, ii (2/1619) he described a complete consort of *Fagotten* or *Dolcianen* consisting of eight instruments of varying size – the *Discantfagott* (g to c"), the *Fagott Piccolo* or *Singel Corthol* (G to g'), the *Choristfagott* or *Doppel Corthol* (C to g'), and two varieties of *Doppelfagott*, a *Quartfagott* (G' to a) and a *Quintfagott* (F' to g). In his *Theatrum instrumentorum* (1620) he showed in addition an *Alt fagott* (presumably c to f'). A hitherto unknown source was discovered in 1994 in Edinburgh ([GB-Eu](#) Dc.6.100). The *Instrumentälischer Bettlermantl* by 'A.S.', a south German manuscript datable to the mid-17th century (Campbell, 1995) describes and illustrates four sizes of *Vagött* – Discant, Alt, Tenor and Bass; the accompanying instructions for reed making (see §5 below) are the earliest known. How long the use of the dulcian persisted is hard to ascertain. Eisel's treatise (1738) dismisses the *Teutscher Basson* as outmoded, but still supplies a chart. Its use by the *Pfeifergericht* at the ceremonial opening of the Frankfurt fair persisted well into the 18th century.

In Spain the dulcian (Sp. *bajón*) enjoyed a long and well-documented period of use, which, according to the researches of B. Kenyon de Pascual, extended from the early 16th until the early 20th century. The earliest reference dates from 1530, when Juan de la Rosa of Pamplona was paid two ducats for repairing *bajones*. The 1616 workshop inventory of the court maker Bartolomé de Selma y Salaverde included small and large dulcians. The four Spanish dulcians preserved in Brussels comprise a tenor, two altos, and one descant, indicating that such smaller models were also in use. Surviving music and inventory records show that they were frequently used through to the 18th century. The fact that all known iconographic sources have an ecclesiastical setting indicates that they were primarily played in church, though there is some evidence of secular use. They were still made and played after the jointed bassoon (*fagot*) was introduced; a 1739 Royal Chapel report specified that 'the *fagoto* – which is an instrument of the same family, though its voice is not so full as that of the *bajón* – will also play'. An early 19th-century listing of 'bajón' with choristers and two 'fagots' with orchestra shows the different functions discharged by each instrument. As late as 1902, a cathedral chapter record mentions a *bajonista*. A painting by the Italian Bernardo Bitti on an organ from a Peruvian convent datable to 1590–95 shows early evidence of a kind of longitudinally sectioned dulcian. Several early 19th-century examples of a five-keyed jointed *bajón* in three or four sections survive.



Early form of dulcian: detail of an alabaster relief by...

Evidence for the dulcian's early use in Flanders is the fact that it was there in 1563 that the earliest known representation was carved (see [fig.3](#)), while in 1566 some *bajones* were ordered for Valladolid. A print from Philipp Galle's *Encomium musices* (Antwerp, c1590) shows another longitudinally sectioned dulcian. In the following century it was portrayed by such painters as Denis van Alsloot, Jan

Breughel the younger, Theodoor Rombouts and Anthonis Sallaert, among others. Evidence from other countries (Poland, Denmark etc.) also shows considerable use of the instrument.

In England it is likely that members of the aforementioned Bassano family were making and repairing dulcians from about 1538 onwards. A Suffolk account book of 1574 records payment 'for an instrument called a curtall'. In 1575 the Waits Band of Exeter was using a 'Double Curtall', and in 1597 the chamberlain of the Corporation of London was ordered to provide a curtall for the musicians at the charge of the City. About 1582, Stephen Batman referred to 'the common bleting music in ye Drone, Hobius and Curtall' (i.e. bagpipe, shawm and dulcian). The Talbot manuscript, which was probably written between 1690 and 1700 (*GB-Och* Music MS 1187), while describing fully the 'Basson' (jointed bassoon) still sees fit to describe fully the 'Double Courtaut' (dulcian). The 'Tenor & Treble Courtaut' and 'Fagot' are briefly mentioned; he tells us that the 'Fagot', which is 'entire' and thus evidently also of dulcian construction, is 'unused', while the 'Double Courtaut' is 'not used in Consort'.

Evidence of the dulcian in France is mysteriously lacking. The fact that it does not figure in Cellier's manuscript of c1585 (*F-Pn* fonds fr.9152) suggests that at that time it was still unknown. It is however in France that evidence regarding other precursors of the bassoon may be found. Predecessors other than the dulcian, such as the 'fagotted' bass shawm and the sectioned dulcian, were evidently also filling the gap before the emergence of the jointed bassoon. Mersenne described and illustrated instruments which may loosely be considered transitional, and recent researches by Kopp and White have yielded fresh insights. Comparing closely Mersenne's Latin version *Harmonicorum libri* (1635–6) with the French *Harmonie universelle* (1636–7), Kopp (*JAMIS*, 1991) has been able to resolve confusing inconsistencies of nomenclature. White ('The Bass Hautboy in the Seventeenth Century', 1994, 167–82) challenges the conventional assumption of a straight development from bass shawm to dulcian to bassoon, arguing that of these the dulcian, far from being more primitive, requires tooling capable of greater accuracy; none of the instruments illustrated show one-piece construction, but rather two discrete tubes wrapped externally (the illustration of the bass *hautbois de Poitou* showing just such a construction). Mersenne wrote that they were 'different from the preceeding bass [shawm] only in that they break into two parts to be able to be managed and carried more easily; that is why they are called Fagots because they resemble two pieces of wood which are bound and fagotted together'. White surmises: that 'the bassoon may not have evolved directly out of the dulcian, but rather out of an interim "fagotted" version of the bass shawm early in the sixteenth century'; and that the dulcian's simplified 'modern' design allowing for oblique chimneys represented an improvement over the sectioned instrument that must have preceded and then co-existed with it. Trichet appeared to corroborate his contemporary Mersenne in his treatise (c1640) by describing, in addition to a small conventional dulcian, a three-piece 'basson' constructed of two discrete tubes, 'deux tuiaux joints ensemble', the larger of which 'pour la commodité se peuvent desmonter et se briser en deux parts'. Only one sectioned model of dulcian survives, in the Kunsthistorisches Museum, Vienna (Sammlung Alter Musikinstrumente no.201); unsigned, but of Italian provenance and datable to about 1600, its upper part is divided into two halves.

3. The early bassoon (to 1800).

It is not clear when or where the precursors of the bassoon evolved into the four-jointed instrument of today, descending one extra tone below the C of the dulcian. The gradual abandonment and replacement of the dulcian was doubtless brought about by such factors as the need for an instrument to match the range of the contemporary 'basse de violon' which descended to *B^b*, and to replace the old high church-pitch instruments that were incompatible with new instruments built at French flat pitch. There was an evident demand for such an instrument with this extended range. Selma y Salaverde had already called for it (see §7 below) and the compass of one of Mersenne's instruments had also been extended to *B* with the aid of a third key. The impulse for this development can be identified as emanating from Amsterdam, Nuremberg and Paris.

An important early iconographic source for the new bassoon is the Dutch painting *Der Fagottspieler* in the Suermondt Museum, Aachen. Unsigned, its attribution to Harmen Hals (1611–69) is dubious, White dating it to nearer the end of the century. The instrument has turned mouldings on the upper joints that served both as decoration and mounts for the keys. The wing joint has the characteristic 'épaule' or thickening of the wall necessary to retain the oblique bore

of the finger-holes. The extra length afforded by the bell, which has a bulb-like cavity at the end, enabled the range to be extended a whole tone downwards to $B\flat$ with the aid of an extra key, and the longer bore and lighter construction made the instrument more free and flexible in the upper register as well. A well-preserved three-keyed bassoon by Richard Haka (Schlossmuseum, Sondershausen), datable to a *terminus ante quem* of 1699, provides significant evidence. Its Baroque profile resembles that of the instrument portrayed in *Der Fagottspieler*. His contemporaries Jan Juriansz van Heerde (fl 1670–91) and Jan Juriansz de Jager (fl c1684–1694) also made bassoons. The additional $G\sharp$ key for the right little finger, shown on the trade card of the Amsterdam maker Coenraad Rijkel (c1705), stabilized the position of the player's hands; formerly the swallow-tail design of the F key had permitted interchangeable hand position. Rijkel's contemporaries, Abraham van Aardenberg, Thomas Boekhout, Michiel Parent and Hendrik Richters, among other notable Dutch woodwind makers, also made bassoons.



Early bassoons: (a) three-key by Johann Christoph Denner, Nuremberg, c1700...

The bassoons from J.C. Denner's Nuremberg workshop (fig.4a) resemble Richard Haka's model. It is known that by 1684 Denner was copying the new French recorders and oboes, and his bassoons may have been built to a French pattern. An engraving by Weigel of a bassoon maker – possibly Denner – at work shows both the two-key dulcian and three-key *Basson* being made (fig.5), but soon the new instrument with its greater potentialities was to dominate. Some 33 three-key bassoons survive.

The traditional view is that the bassoon, along with other Baroque woodwinds, was developed in the time of Louis XIV in France by members of the Hotteterre family, working as wind players and makers in Paris. Nicolas Hotteterre (i) (c1637–1694), a bassoonist for the royal chapel from 1668 and the first identifiable bassoon maker of the family, was possibly foreshadowed by other earlier relations. However, both the dulcian and bassoon are conspicuously absent among the woodwind instruments represented in the Gobelin tapestries of 1669, which show instead the *cromorne*, which appears to have functioned as bass to the reed group in France at this time (see Haynes, 1997). Borjon de Scellery's *Traité de la musette* (1672) mentions the use of musette with 'cromornes, flûtes & bassons'. Haynes concludes that 'since bassoons played with *cromornes* and musettes, and hautboys did as well, hautboys and bassoons were probably able to play together by 1672. Thus some new model of bassoon would have been in existence by that date'. By the 1680s there are references to bassoons of the new type, i.e. designed to play at flat pitch like the other new Hotteterre woodwind instruments. In 1680 Lully scored for basson in his opera *Proserpine* and regularly thereafter (with a range of $B\flat$ to f). In 1686 the Darmstadt court appointed the bassoonist Maillard, presumably from France.

It was in England that the new instrument was first described and illustrated. Here James Talbot gathered detailed information from London professional players, both native and French: White tentatively dates his inquiries to 1685–8. Talbot confirmed that the 'French Basson' in '4 Joynts' had three keys and a compass extending down to $B\flat$. According to his brass authority William Bull, it had been the 'Fr. Basson' that had replaced the trombone after it had been 'left off towards the end of the reign of King Charles II (d 1685). Around this time, Randle Holme (before 1688) described and illustrated what he called a 'double curtaile', which however appears to be a three-jointed bassoon. The employment of Jacques Hotteterre, brother of Jean (1648–1732), in London as an oboist is documented in 1675 (Giannini, 1993); doubtless he helped introduce the family products. Both the tenor oboe and bassoon had arrived from France by 1687 (see Lasocki, 1988). This traffic is documented later in a letter of 1711 by Louis Rousselet, another French oboist employed in London, who ordered two bassoons, one right-handed and one left-handed, from the well-known Parisian maker Jean-Jacques Rippert (Giannini, 1987). The earliest French illustration of the new bassoon is on the title page to Marais' *Pièces en trio* (1692). The plain severity of its bell, free of Baroque turnery, resembles that of Stanesby.

Two unique double-reed instruments – the *basse de musette* and *basson d'amour* – built in the 1760s in a French-speaking Swiss valley colonized by Huguenot refugees, were possibly derived from lost French models. The four-jointed, three-keyed *basson d'amour*, 14 examples of which survive, displays unique features; these include a globular brass bell, which augments the tone

like a Helmholtz resonator, and a pirouette at the crook end to facilitate playing (see [HAUTOIS D'ÉGLISE](#)). Designed for church use, many lack the left-hand keys deemed unnecessary for psalm accompaniment (see Staehelin, 1969–70).



Early bassoons: (a) three-key by Johann Christoph Denner, Nuremberg, c1700...

The four-key instrument was to remain the model in standard use for the rest of the century. Halle (1764) reported that the best were made of boxwood: examples by J.H. Eichentopf, Poerschmann and Scherer survive. The Baroque mouldings of the upper three joints disappeared, the keys being mounted instead on projecting bosses or on saddles. The bore of the bell was changed to an inverted taper and sometimes a small resonance hole was added. The earliest extra keys to be added were for those low notes for which the standard 'forked' fingerings were less satisfactory: a chart by

Hotteterre and Bailleux (c1765) first shows the fifth $E\flat$ key for left thumb (later moved by Grenser to left little finger), and a right-thumb

key (for a' ; also $F\sharp$) followed later. A more significant advance was

the addition of a 'harmonic key' on the wing joint to obtain high-register notes, sometimes even being added to existing instruments ([fig.4c](#)). This was first reported in France in 1787 (according to Ozi, it was 'in almost universal use') and 1786–7 in Germany (a six-keyed instrument, complete with hand rest, is depicted on the seal attached to the will of Franz Anton Pfeiffer, court bassoonist at Ludwigslust). From Ozi (1787) we also learn that French makers had by this time already

shifted the $G\sharp$ key-hole away from its traditional site on the narrow butt bore to just below the F key-hole; other makers were not to follow suit for at least a generation. Ozi used an instrument by Keller of Strasbourg; the best-known Paris makers of this period were Bizey, Lot, Porthaux and Prudent. In Germany, the Dresden *Fagot* was considered the best; most notable were those made by the Grensers and their contemporaries Grundmann and Floth. A portrait of Felix Rheiner, painted in 1774 by Horemans, shows the earliest recorded use of a pinhole in the crook, here operated by a key. Cugnier also advocated the pinhole in 1780, but it was not to come into general use until the 19th century. Almenraeder considered that it might be dispensed with on a broken-in, but not on a new, instrument. Extra keys of any sort were slow in becoming standard: Koch's lexicon of 1802 describes the five-key instrument with two octave keys 'found on recent instruments'.



Early bassoons: (a) three-key by Johann Christoph Denner, Nuremberg, c1700...

In England, bassoons were made in considerable quantities throughout the 18th century; John Ashbury (*f* London, 1698), Peter Bressan (1663–1731) and Thomas Stanesby (i) are the earliest recorded makers. However, only two English bassoons have survived from before 1750 (one each by Stanesby (i) and (ii); see [fig.4b](#)). The Milhouses of Newark and London later became the most notable makers. The bell of these earlier English instruments has a characteristic baluster contour and a pronounced inverted taper. The widespread use of church bands, in some places having up to seven instruments, as well as the demands of professional and military music making, gave work to numerous makers in London and the provinces. The tone-colour of the bassoon became

more mellow and expressive throughout the 18th century. In Germany, Mattheson's 'stoltze Basson' (1713) became the 'Instrument der Liebe' of Koch (1802), while French writers stressed its powers of expression, comparing it to the human voice. The early Sonata by Telemann (1728) already makes considerable technical demands, and the works written by Mozart in 1774 (κ 191/186e and 292/196c) indicate the expressive range expected from the instrument by then.

4. Development of the modern bassoon.

In the 19th century, several factors helped to bring about developments in instrument making. These included the increasing demands of composers regarding technique, expression and extension of the range upward; the rise of the solo virtuoso-composer; larger orchestras and concert halls demanding louder-toned instruments; international trade exhibitions encouraging competition and experiment; instrument makers who had backgrounds as excellent performers

(including Savary *jeune* and Almenraeder); and technical advice from acoustic experts such as Gottfried Weber.

While Cugnier's exceptional chart of 1780 showed fingerings up to *f*'' apparently possible on a five-key instrument without octave keys, the gradual introduction of up to three such keys on the wing undoubtedly facilitated notes from *a*' upwards, even if composers were still reluctant to write above *g*' in the orchestra. Simiot of Lyons, an important innovator, provided, in addition to these, closed keys for *B*' and *C*#, notes hitherto unobtainable except by 'faking'; other refinements included bushing finger-holes with metal tubes against water, and (in 1817) replacing the cork plug with a metal U-bend bow, an improvement later adopted in Germany.



Early bassoons: (a) three-key by Johann Christoph Denner, Nuremberg, c1700...

Improvements made by the leading Paris makers Savary *jeune* and Adler included key-rollers (introduced in 1823) and one or two tuning-slides on the wing to obviate the need for several *corps de rechange*. Attempts were made to obtain the greater volume desired for the military band by widening the end of the bore with a broad flaring bell, or even widening the bore of the entire instrument (Winnen's 'Bassonore' of 1834), and by making the instrument in metal. Both Charles-Joseph and Adolphe Sax experimented with brass instruments with covered keys; Sax *filis* patented in 1851 a 24-key metal bassoon with regularly spaced holes which was demonstrated at the London Exhibition that year. The instrument favourably impressed Boehm, who subsequently calculated his 'Schema' of hole dimensions for a bassoon bore which Triébert and Marzoli of Paris used for their model of 1855, together with many of Boehm's innovations for the uniquely intricate keywork (shown in [fig.4c](#)). Another system comparable to that of Sax was worked out in London by Ward and Tamplini and patented in 1853. However, altering the traditional relationships between size and position of holes and wall thicknesses caused the instrument to lose its characteristic tone quality. The complexity and expense also militated against the 'Boehm bassoon', and it failed to catch on. Meanwhile, however, the efforts of the player and teacher Jancourt, working with Triébert, Gautrot *ainé* and Buffet-Crampon, led to the development in 1879 of the 22-key model which has with minor modifications since established itself as the standard French-system bassoon (see [fig.1b](#)).

In spite of the achievements of the Dresden makers, the bassoon in Germany was still far from satisfactory, especially as compared to the other woodwinds. Fröhlich (1810–11), who praised its qualities – the majesty of its bass and the grace of its middle and high registers – described the situation at this time: to adjust to different pitches, instruments were sold with a set of three wing joints of differing lengths, and with as many crooks. Standard bassoons had six keys, the more recent ones with two extra 'octave' keys on the wing for *a*' and *c*'', but many instruments still had only five or even four keys. Because of the lack of standardization of keywork or bore, no given set of fingerings would suit everyone; different notes were always out of tune, needing correction with special fingerings. On French bassoons of the period many fingerings were different; those given in the 1805 and 1806 translations of Ozi's 1787 tutor were impracticable on German-built instruments.

This state of affairs was to be remedied by Carl Almenraeder (1786–1843), the 'Boehm of the bassoon' (Sachs, *Reallexikon*, 1913). Though some of his innovations can be traced to others, he nevertheless remains the most important figure in the history of the instrument. With the advantage, like Boehm and Savary, of a virtuoso ability on his instrument, he had experience as bandmaster, teacher, player and composer. In 1817, while playing in the Mainz orchestra, he met Gottfried Weber, who had recently published valuable articles on woodwind acoustics, and started working in the Schott factory at those experiments to improve and reform the bassoon which were to occupy him almost up until his death in 1843. His treatise of 1823 and subsequent articles describe how, by adding certain keys and relocating others, he improved the intonation and response of certain notes, extended the range up to *g*'' and facilitated passages in extreme keys. While leaving the bore as far as the fifth finger-hole essentially unaltered, he enlarged the tone holes sounding from A downwards and moved them further down towards the bell. Highly significant too was the replacing of the old resonance hole in the bell with an open key for *B*'. Reports of these improvements appearing in Schott's house journal *Caecilia* attracted the attention of Beethoven, who closely questioned the local Viennese player Mittag about them and even asked Schott (letter of 25 November 1825) to send him one of the new instruments. An

important discovery was that the intonation and response of certain notes could be improved by opening a second vent hole into the large bore of the double joint; other innovations included fitting a metal U-bend bow at the end of the butt, using stuffed pads and connecting keys with a pin through the inner wall of the double joint.

Almenraeder's monumental tutor (completed 1836, but not published until 1843) is for his improved 17-key model with a complete chromatic range of four octaves (*B \flat ' to b \flat "*), and gives many interesting data on technique, reeds and instrument construction. In 1831 he had founded his own factory in Biebrich with J.A. Heckel (1812–77). After Almenraeder's death in 1843 Heckel (and his descendants for two generations) continued the manufacture and gradual refinement of what has since become known as the *Heckelfagott*, the model gradually adopted by the other German makers. Wagner, who in 1862 was living nearby and took an interest in these developments, persuaded Heckel to build a longer bell to reach *A'*, and later endorsed Wilhelm Heckel's improved double bassoon of 1879, which he subsequently employed in *Parsifal*.

By 1887, when Weissenborn's tutor for the Heckel bassoon appeared, this model of the instrument was starting to predominate throughout Germany and also in Austria, where the traditional 'Wiener Fagott' of Ziegler and Uhlmann (which retained the traditional venting of the bell by having a closed *B'* key like the instruments of the French makers) had hitherto held its own against the reformed instrument. As early as 1825 C.-J. Sax exhibited a model entirely key-operated, while his son Adolphe patented a similar 23-key model in metal in 1851. Elements derived from Boehm's 1832 and 1847 flute models were soon adopted by such makers as Ward-Tamplini, Triébert-Marzoli and Haseneier. The latest and most promising of such 'reform' models was that of F.W. Kruspe (patented 1893), a radical new design that offered logical and simple fingering patterns, though it failed to catch on. Heckel's achievement had been to recapture the good singing qualities of the old Dresden bassoons, which the earlier Almenraeder instruments with their harder tone quality had forfeited, while retaining the technical advantages developed by Almenraeder. Further improvements by Heckel, who in 1898 claimed to have made over 4000 bassoons, included minor alterations to bore and tone-hole placement, especially on the butt; lining the wing, an idea first adopted by Morton (London, c1870), with hard rubber (1889); and fitting a key for the crook-hole (1905).

In England the local production of instruments had dropped considerably by Victorian times owing to the disappearance of the church bands and the preference of professional players, many of them foreigners, for French instruments. Ward's 'Boehm' model, patented in 1853, failed to raise any further interest. The foremost maker, Morton, trained in Vienna, made instruments on the French pattern. From about 1900, while English bassoons remained in military use, the requirements of low-pitch orchestras were met by instruments from abroad.

In the 20th century the use of the German bassoon gradually became more universal. In England the importing by Hans Richter of a pair of Viennese players to Manchester in 1899 subsequently established there a cell of 'German' players which, as Baines related, later spread to London. Cecil James, who retired in about 1980, was the last English protagonist of the 'Buffet' model. In the USA, the takeover occurred even earlier, and Italy and Spain have now followed suit. This process has been brought about by the ever-increasing demands of conductors and record producers for power of sound, homogeneity and balance, but has not always met with approval. In 1934 the English composer and conductor John Foulds remarked that:

"it was the common practice of Schubert (and his contemporaries) to eke out his two horns with two bassoons in four-part harmony. Now the bassoon is the bass instrument of the oboe family. But so intent have been both players and conductors upon producing instruments capable of fulfilling the duties of deputy horns, so to say, that German bassoons of today, forsaking their true family, have become a sort of wooden horn and have, to really sensitive ears, lost more than they have gained."

He went on to say that 'French, Belgian, and some English bassoons retain the true, slightly more reedy, certainly more sympathetic quality which allies the instrument to its true double-reed family' (*Music To-Day*, London, 1934). The dying-out of the French instrument would indisputably be a deplorable loss, and there are continuing efforts to improve the instrument and to safeguard its

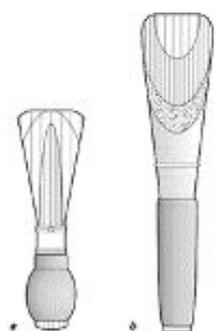
future. At the Paris Conservatoire both systems are currently taught in separate classes.

Among players of German bassoons, the instruments by Heckel maintained a unique status for many years. The production of instruments from other factories, however, has steadily increased. Before World War II the makers Adler, Hüller, Kohlert and Mönnig were notable. Current makers include: Adler-Sonora, Amati, Heckel, Mollenhauer, Mönnig, Moosmann, Püchner, Schreiber, Soulsby, Walter, Wolf (Europe); Bell (Canada); Fox, Linton (USA); and Yamaha (Japan). There are others in China and Brazil. 'Buffet'-model instruments, formerly produced not only in France (Paris and La Couture) but in Belgium (Mahillon) and London (Boosey, Hawkes, Morton), are now made only in Paris (Buffet-Crampon, Selmer). Current makers of replica models include: Olivier Cottet, Laurent, Vergeat (France); Moeck, Rainer Weber, Guntram Wolf (Germany); Matthew Dart, John Hanchet, Graham Lyndon-Jones, Barbara Stanley (UK); Peter de Robinson and Koningh (the Netherlands); Robert Cronin, Robinson and Ross (USA).

5. The early reed.

In view of the relative importance of the reed, which is continually stressed by the writers on the instrument, it is unfortunate that so little is known about what they were like until comparatively recent times. As an ephemeral accessory in constant need of replacement, surviving specimens (and their reed cases) are relatively rare. Of these, pitifully few can be tentatively assigned to the 18th century.

The earliest iconographic source for a dulcian reed is the painting by Bernardo Bitti in Cuzco, Peru (1590–95); reeds are also illustrated in Praetorius (1620), Mersenne (1636–7) and by Jan de Reyn (c1670); all are shaped somewhat like a straight-sided isosceles triangle. A still life by Franz Friedrich Franck (Städtische Kunstsammlungen, Augsburg) shows a dulcian with reed attached of a longer bassoon-like model with a long 'V' scrape extending to the thread wrapping. The earliest reed-making instructions are those in the *Instrumentälischer Bettlermantl* (mid-17th century); though tantalizingly vague, they offer some valuable data – the reed is to be bound with either wire or resined thread – that is not otherwise available at this early date. Otherwise, the sole evidence available is offered by the 21 reeds in Madrid that accompany the late-18th-century *bajones* there (Kenyon de Pascual, 1984; White, 1992). Most are shorter (55–6 mm), flatter and wider (19–20 mm) than bassoon reeds: like these, they are wired.



Reed scrape patterns: (a) modern reed; (b) early reed

With regard to the historical bassoon reed, White's ground-breaking research (1992, 1993, 1994) has shed light on many aspects of this hitherto neglected area, while raising many intriguing questions that have yet to be answered. He has subjected the available written sources, together with some 22 reeds for *bajón* and 91 for bassoon, to close scrutiny. His methodology delineates scrape patterns topographically, distinguishing between cane stratae – bark, dermis, dense and broad parenchyme (fig.6). He is able to show that 17th-century reeds were built on staples, were relatively long and narrow, bound with waxed thread rather than metal bands, and scraped to a V or U shape. Several stapled reed-forms co-existed: a conventional oboe-type staple; a cane section inserted into an external staple; or

direct reed insertion into a wide-mouthed crook. The transition from stapled to 'cane only' construction occurred towards the end of the era of the four-key bassoon (although persisting locally well into the 19th century). Thread binding was replaced by metal banding. Pre-formed bands were pressed into position to tune the reed, like the rasette (tuning-wire) of an organ reed-pipe, a system persisting longest in England. Continental reeds mostly conformed to Ozi and Almenraeder models well into the late 19th century. The gouge, scrape, banding, size and proportions of early reeds differ markedly from their modern counterparts. Early reeds were hand-gouged, often internally tapered towards the tip, allowing blade material to be of denser cane quality. External scraping was shallow, resulting in a V or U shape stopping well short of the front banding. The adjustment capability of the 'positional' pre-formed band differed both from the continuous support of the earlier thread-wrap and the re-distribution of fulcrum forces through the fixed-position, double-wire banding of today's reed. Tensional difference between these systems may have required compensational alterations in scrape, gouge thickness and embouchure

support. White's findings raise uncomfortable questions regarding how certain anachronistic practices employed today relate to 'authenticity'.



Bassoon reeds: (a) French, mid-18th century (after de Garsault, 1761);...

Early bassoon reeds were considerably longer than modern ones (fig.7). In *Der Fagottspieler*, the bassoon player's reed is approximately the length of his middle finger and has a wide flare. An engraving (1760) of the virtuoso Felix Rheiner shows him holding a broad reed of similar length with a horseshoe-shaped area of bark removed as in some modern oboe reeds. De Garsault (1761) illustrated a narrow reed 7.5 cm long and 1 cm wide at the tip (fig.7a), while Cugnier (1780) recommended a length of 28 or 29 to 32 lignes (6.5–7 cm). Ozi (1803), Fröhlich (1810–11), Neukirchner (1840) and Almenraeder (1843) all gave detailed accounts of reed making which broadly correspond, although Almenraeder's reed is narrower and longer than that of Fröhlich (fig.7c). All agree on one

significant point: the piece of cane was placed in a wooden mould for gouging by hand with a scoop-shaped chisel in order to leave it thinner at the middle, so that when made up little thinning at the blade was required once the bark was removed. The cane at the tip of the blade was thus of finer texture and more durable: Almenraeder achieved a life of up to two years for a reed in daily use. However, the subsequent universal adoption of the gouging machine (invented by the oboist Henri Brod 1834, later developed by Triébert c1845) which gives a rigidly vertical gouge to the piece of cane means that with most modern reeds this rind-wood is removed towards the tip, exposing coarser-grained pith-wood. Flament (*Exercices techniques*, op.40, 1919) recommended storing reeds for four years to avoid spongy cane, but still expected them to last only about a week. It cannot be said that modern machinery and precision techniques have done much to alleviate these perennial problems.

6. Charts and tutors.

Early fingering charts and tutors constitute a valuable reference source that documents the history and development of every woodwind instrument. With the bassoon, given the virtual non-availability of surviving historical reeds, authentic matched crooks and even 'uncorrupted' instruments, fingering charts alone are able to offer unimpeachable evidence. White (1990) states that 'by applying these fingering patterns to surviving original bassoons, or modern copies of these instruments, one can determine how close the modern player/maker is coming to an original concept of sound, reed style, temperament, pitch standard, and tuning'. Likewise, guidance on questions of performing practice may be derived from tutors of the period.

Fingering charts are found in many treatises and encyclopedia articles, as well as in tutors and independently published flysheets. They are usually presented in the form of a table: they are especially useful when also accompanied by written annotations regarding individual notes. Apart from the fingerings themselves, other significant information can be gleaned by the way in which they are differentiated, how some distinguish between $d^{\#}$ and e^b , the compass selected, and the illustrations of contemporary models that usually accompany them. Table 1 lists a selection of works containing dulcian and early bassoon charts.

Early tutors can offer information unavailable elsewhere on such significant topics as ornamentation and reed making, as well as playing techniques. The mid-17th-century German treatise *Instrumentälischer Bettlermantl* is an important early source regarding reed making (see

§5 above); J.S. Halle's *Werkstätte der heutigen Künste*, iii (c1779) also includes brief but significant information on the subject (p.368). The earliest known monograph dedicated to the bassoon is the anonymous *Compleat Instructions for the Bassoon or Fagotto* (London, c1770). However the informative 20-page article in La Borde's *Essai* (pp.323–43) by the player Pierre Cugnier constitutes the first real tutor for the instrument. Two significant methods were published by Etienne Ozi: his *Méthode nouvelle et raisonnée pour le basson* (1787) has seven pages of material relating to playing position, model of instrument, embouchure, choice of reed and tone production. Ozi's later work, *Nouvelle méthode de basson*, first published in 1803, is the earliest comprehensive tutor for bassoon and has remained in print ever since. It includes information on reed making, with illustrations of tools, and is an entirely different work from his 1787 tutor. The earliest original tutor published in German is Wenzel Neukirchner's *Theoretisch practische Anleitung zum Fagottspiel* (1840); the significant works of Carl Almenraeder have already been discussed (see §4 above). Julius Weissenborn's *Praktische Fagott-Schule* (1887) relates specifically to the Heckel bassoon; it remained in use for a century. More recent examples are by Seltmann and Angerhöfer (based on the German system), Maurice Allard (French system) and Sergio Penazzi (for avant-garde techniques). Additional pedagogical sources are cited in the bibliography.

7. Repertory and use.

While the earliest use of the dulcian was as a strengthening element to the bass, it began in the early 17th century to assume a more independent role; Schütz in his Psalm xxiv (SWV476) used a consort of five dulcians of different pitches (total range *A'* to *a''*) as a self-contained group. The instrument also began to be used with just one or two other instruments and continuo, for example by Mikolai Zielenski (*Fantasia*, 1611), Biagio Marini (*Affetti musicali*, op.1, 1617; *Sonate*, op.8, 1629, ded. 1626), Gabriele Usper (*Compositioni armoniche*, 1619), Giovanni Battisti Riccio (*Terzo libro delle divine lodi musicali*, 1620), Stefano Bernadi (*Madrigaletti*, 1621), Giovanni Picchi (*Canzoni da sonar*, 1625), Dario Castello (*Sonate concertante: libro primo*, 1621, *libro secondo*, 1629), Mathias Spiegler (*Olor Solymaeus nascenti Jesu*, 1631), Giovanni Battista Buonamente (*Sonate et canzoni*, 1636) and Giovanni Battista Fontana (*Sonata*, 1641). (For an extensive listing of 17th-century dulcian music see Wagner, 1976.) The first solo composition was a *Fantasia per fagotto solo* in the *Canzoni, fantasie et correnti* by Selma y Salaverde (Venice, 1638), who was descended from a family of Madrid instrument makers. In a dedicatory sonnet he is praised for his skill on the instrument; exceptionally, the piece descends to *Bb'*. The nine sonatas comprising the *Compositioni musicali* (1645) by the player Bertoli, the earliest set of sonatas for any one instrument, were written for the two-key dulcian (range *C* to *d'*), as was the *Sonata sopra La Monica* (from *Sacra partitura*, 1651) by the Darmstadt Fagottist P.F. Bötdecker, a tour de force of technical virtuosity for its time. A sonata by 'M.G.' (c1686, *I-MOe*) remains unpublished. Daniel Speer's tutor (1687) contains two sonatas for three dulcians designed to exemplify writing for the two-keyed instrument. Its use in ensemble is documented as early as 1589, when *tromboni, cornetti, dolcaina e fagotti* took part in the *intermedi* composed for *La Pellegrina* in Florence by Christofano Malvezzi (Elsner, 1935, p.58). The earliest known use of the instrument in opera is in Cesti's *Il pomo d'oro* (performed 1668), where it is grouped with cornetts and trombones.

The late 17th century was a point of transition when the dulcian still co-existed with the new jointed instrument; therefore it is hard in certain circumstances to know which instrument may have been intended. However, the advent of the new jointed bassoon, with its increased range of tone and expression, gave new impetus to composers, and orchestras increasingly began to include the instrument. In Hamburg, where up to five were available, Keiser's *Atlanta* (1698) and *Octavia* (1705) each included an aria accompanied by five *Fagotte*. With the operas of Lully the instrument assumed a new function of bass to a wind trio consisting of two *hautbois* and *basson*, which are used as a contrasting group to the strings (e.g. *Psyché*, 1678); the same pattern was followed by Purcell in *Dioclesian* (1690). Mattheson (1713) perceived the role of the 'Proud Bassoon' as forming 'the usual bass, *Fundament* or *Accompagnement* to the oboe'. He went on to say that 'it is reckoned easier to play, not calling for the same *Finesse* or ornamenting (but perhaps other skills instead); however anyone wishing to distinguish himself on it in the upper register with delicacy and speed has a considerable task'. In 1728 Telemann published his *Sonata* in F minor, with its pathetic echo effects and tenor cantilena. Two sonatinas followed in 1731. From this period there are also sonatas by Carlo Besozzi, J.F. Fasch, J.D. Heinichen and

Christoph Schaffrath. Vivaldi's 39 concertos for *fagotto* (preserved at [I-Tn](#)), outnumbering those he wrote for any other instrument save the violin, represent a unique legacy. While RV502 was dedicated to a local player Gioseppino Biancardi, and RV496 to his Bohemian patron Count Wenzel von Morzin, the others were presumably written for the girls of the Pietà orphanage where the composer taught from 1703. Fertonani (1998) dates their composition to between 1720 and 1740. The remarkable solo writing pre-empted many of the characteristics of later bassoon style, including rapid leaping between registers, lyrical tenor passages, and the occasional use of dynamic and expression marks. While the *a'* in RV487 and the *Bb* in RV495 would appear to demand bassoon, the somewhat restricted compass of C to *g'* employed in the other concertos suggests dulcian, raising doubt as to the instrument intended. Other concertos are by J.G. Graun, Graupner, Mützel, J.F. Fasch and J.C. Bach. Chamber works include trio sonatas by Telemann, Handel and C.P.E. Bach and a remarkable set of sonatas with two oboes by Zelenka. J.S. Bach in his cantatas gave the bassoon several important obbligatos; his use of the instrument was limited by the players at his disposal, but for players like Torlle at Cöthen he was able to make considerable demands: movements like the second Bourrée in the fourth suite require fluency in an extreme key, and the 'Quoniam' of the B minor Mass is written up to *a'*. C.P.E. Bach gave the bassoon an obbligato in his oratorio *Die Israeliten in der Wüste* (1769), while 'Non m'alletta' from *Temistocle* (1772) by J.C. Bach resembles a concerto in miniature.

In England in 1733 Galliard published his six sonatas, which display characteristic writing for the instrument: no.4 descends to *B'*, a note obtained by 'pinching'. Mercier's six sonatas followed in about 1735. The use of the bassoon in English orchestras was also increasing. Galliard's 'New Concerto grosso [for] 24 Bassoons, accompanied by Caporale on the Violoncello', performed on 11 December 1744 in London, has not survived. Concertos with string accompaniment were written by Capel Bond (1766) as well as Henry Hargrave (1762). Boyce's *Solomon* (1743) contains the once well-known aria 'Softly rise' with bassoon obbligato: a reported concerto is lost.

In France Boismortier published, from 1726 onwards, several sets of duets for two bassoons; his were the earliest of a considerable quantity subsequently written for teaching purposes. Corrette wrote a charming work, *Le Phénix*, for four bassoons as well as *Les délices de la solitude* (c1739) with continuo. In Germany the bassoon was considered indispensable in the orchestra (even if not always given an independent part) as a means of consolidating and clarifying the bass line. Writing in 1784–5, C.F.D. Schubart asserted that the bassoon was able to 'assume every role: accompany martial music with masculine dignity, be heard majestically in church, support the opera, discourse wisely in the concert hall, lend lilt to the dance, and be everything that it wants to be' (*Ideen zu einer Ästhetik der Tonkunst*, Vienna, 1806/R). For orchestral playing Quantz in 1789 recommended the proportion of one bassoon to nine strings, two bassoons to 13 strings and three bassoons to 21 strings. A pair were to become the regular complement of the Classical orchestra, although in France two pairs were usual. There the demand for players was so great that for a period at the end of the century the Conservatoire was employing four professors to teach the bassoon.

Mozart's use of the instrument shows a great understanding of its nature and potentialities; his early Concerto in *Bb* K191/186e (1774) remains the most significant in the bassoonist's repertory. It is not known who commissioned the 18-year-old composer to write it; the amateur Baron Dürnitz, a composer of bassoon music himself for whom the sonata with cello K292/196c was probably written, can be discounted. Jahn's supposition that he wrote three further concertos for Dürnitz is unfortunately not supported by any other evidence. A second concerto (K230/196d), first published by Max Seiffert in 1934, was attributed by Hess (*MJb*, 1957) to Devienne, although Montgomery (1975) convincingly disproved this. Chamber works for bassoon and strings, a combination unlikely to entail problems of balance, were written in considerable quantities in the Classical period. G.W. Ritter's lead (1778) was followed by Carl Stamitz, Devienne, Krommer, Danzi, Johann Brandl, Reicha and many others.

Works for bassoon with orchestra from this time fall into two categories. The first consists of concertos written by professional composers, usually with specific players in mind. Among these are notable works by Danzi, David, Michael Haydn (that by Joseph Haydn, c1803/4, is lost), J.N. Hummel, J.W. Kalliwoda, Kozeluch and Berwald. Efforts to identify definitively a reported *Concerto da Esperienza* (c1845) by Rossini have not so far proved convincing, although more than one work has been proposed. A *Pezzo da Concerto* (1813) for bassoon and horn by Paganini has recently come to light (as has also his youthful set of three *Duetti concertanti* for violin and

bassoon commissioned in 1800 by a Swedish amateur). Weber composed two works of capital importance to the repertory: the concerto written in 1811 for Brandt of Munich, in which the alternation of brilliant passage-work and lyrical melody shows off well the bassoon's capacity for both wit and pathos, and the *Andante* and *Hungarian Rondo*, a successful reworking of a piece originally for viola. A recently discovered *Capriccio* by Verdi for bass clef instrument and orchestra, datable to the early 1830s, was probably intended for bassoon. In the second category are works written as display pieces by performers (usually for their own use), for example Gebauer, Jacobi and Almenraeder. According to the fashion of the time, these often took the form of pot-pourris and variations. Among the many concertante symphonies, the one ascribed to Mozart (for oboe, clarinet, horn and bassoon) and that by Haydn (for oboe, bassoon, violin and cello) are notable. Works for two bassoons and orchestra by Dieter, Johnsen, Schacht and Vanhal survive; one by Danzi is lost.

Sonatas with piano were comparatively rare at this period. The substantial sonata by Liste (1807) may be considered the most important for any woodwind instrument prior to Weber. Others were composed by Reicha, Krufft, Amon, Moscheles and Theuss; there are some smaller pieces by Spohr, Christian Rummel and Jacobi. Almenraeder's solo pieces, with their unique exploitation of the highest register up to *g'*, mark the end of an era in which solo music for wind was fashionable. In France, the virtuoso Jancourt assembled for his repertory a large number of transcriptions as well as his own compositions. Notable examples of 'morceaux de concours' were written by Pierné, Bourdeau and Büsser.

Concerning its role within the orchestra, the bassoon was criticized by 19th-century writers as being 'a weak-sounding instrument that gets lost among loud forces' (Fétis, *Revue musicale*, viii, 1834, pp.148 and 326). Fétis recommended that 'in a well-equipped wind orchestra, there should never be less than eight bassoons'; he even recorded an occasion where he used as many as 30. Berlioz too noted the bassoon's lack of volume and remarked that 'its timbre, totally lacking in *éclat* and nobility, has a propensity for the grotesque which must be borne in mind when giving it prominence'. However, he also said that 'the character of its high notes has about it something painful, complaining, almost wretched, which can sometimes be surprisingly effective in a high register melody or an accompanimental pattern' (*Grand traité d'instrumentation*, 1843).

Among the vast output of the 20th century, the following works are noteworthy: concertos and other concert works by Elgar, Wolf-Ferrari, Villa-Lobos, Jolivet, Françaix, Jacob and Maconchy; recent British works by John Addison, Judith Bingham, Stephen Dodgson, Robin Holloway, John Joubert and Peter Maxwell Davies, and in North America by Elliott Schwartz, Gunther Schuller, John T. Williams and E.T. Zwilich; a concerto by the Russian composer S.A. Gubaydulina (along with two other significant works for bassoon); concertante works by Strauss (clarinet and bassoon) and Hindemith (trumpet and bassoon); sonatas and other works by Tadeusz Baird, Roger Boutry, Eugène Bozza, Mario Castelnuovo-Tedesco, Dutilleux, Hindemith, Hurlstone, Longo, Nussio, Saint-Saëns, Skalkottas – his *Sonata Concertante* (1943) is the outstanding sonata of the century – and Tansman (a sonata by Poulenc, 1957, remained unfinished at his death and is lost); unaccompanied solo pieces by Apostel, Arnold, Bruno Bartolozzi, Jørgen Bentzon, Berio, Boulez, Jacob, Stockhausen and Isang Yun; bassoon ensembles by Bozza, Victor Bruns, Alois Hába, Jacob, Prokofiev, William Schuman and Peter Schickele; and bassoon and string works by Kalevi Aho, Bax, Françaix and Jacob. The increased prominence given to the bassoon in many 20th-century orchestral scores is exemplified by the opening of *The Rite of Spring*, a solo in the upper register. During the century various new techniques were demanded of the instrument, among them double- and triple-tonguing, flutter-tonguing, multiphonics, pitch bending, quarter tones, and vocalizing while playing. Many of these are exploited in Bartolozzi's *Concertazioni* for bassoon, strings and percussion and Stockhausen's *Adieu* for wind quintet (see Penazzi, 1982, and Ouzounoff, 1986). More recent is its use with contact microphones and live electronics.

8. Performers and teachers.

The earliest performers known by name are the composers Bertoli, Selma y Salaverde and Bøddecker, whose florid writing indicates the existence of a high level of dulcian technique in the 17th century. Vivaldi's concertos suggest that standards in Italy were particularly high; the playing of Paolo Girolamo Besozzi (1704–78) of Parma was praised by several writers, and the earliest

German virtuoso of note, Felix Rheiner (1732–82) of Munich, of whom two interesting portraits survive, was sent to Turin to study with him. His pupil Franz Anton Pfeiffer (1752–87) was praised, among other things, for his double-tonguing; his use of ‘three-part harmony’ in a solo cadenza was doubtless a multiphonic effect. Georg Wenzel Ritter (1748–1808), ‘the finest bassoon player I ever heard’ (Kelly, 1826), of Berlin started his career in the Mannheim orchestra, making Mozart’s acquaintance there; while in Paris in 1778 he published a pioneering set of bassoon quartets. The bassoon part in the *Sinfonia concertante* Mozart said he wrote in Paris was for him. Among Ritter’s pupils were Carl Baermann (1782–1842), who succeeded him in the Berlin orchestra and became well known as a soloist, and Georg Friedrich Brandt (1773–1836) of Munich, for whom Weber wrote his concerto and Hungarian Rondo. Other German virtuosos included Carl Almenraeder, the Bohemian Wenzel Neukirchner (1805–89) of Stuttgart, who like Almenraeder wrote a tutor and solos as well as attempting practical improvements to his instrument, and Carl Jacobi (1791–1852) of Coburg, who published a number of interesting bravura pieces. Julius Weissenborn (1837–88) of Leipzig and Ludwig Milde (1849–1913) of Prague left teaching material which is still widely used today.

In France the best-known players have traditionally taught and written tutors as well. The treatise of Pierre Cugnier (*b* 1740) appeared in La Borde’s *Essai* of 1780; Cugnier wrote that the bassoon ‘might imitate the sound of the recorder, were it possible for that instrument to play as low. But its tone must never be denuded of that kind of “bite” (*mordant*) proper to it which lends it the necessary timbre; otherwise it will resemble that of the serpent, which would be disagreeable’. The tutors of Etienne Ozi (1754–1813), who was appointed to the Conservatoire in 1795, have already been discussed (see §6 above). Tutors were also written by his successors Berr, Willent-Bordogny, Jancourt, Cokken and Bourdeau (see §6 above, esp. [Table 1](#)); Eugène Jancourt (1815–1901) had a notable career as a soloist as well, and wrote and arranged an extensive repertory of solo pieces; this corpus of 116 works forms a valuable contribution to the repertory. His tutor includes information on tone vibrato, which was not to be confused with embellishment. Jancourt wrote that ‘this is not an ornament dictated by taste, but the result of deep feeling expressed on the instrument’ and that it was obtained ‘by shaking the right hand over the finger-holes’. Writing over 100 years later, the English bassoonist Archie Camden expressed his opinion that ‘the wide, throbbing kind of vibrato – wow-wow, wow-wow – is in bad taste ... whether it is vocal or instrumental, and can easily make a bassoon sound like a badly played saxophone’.

In England, early players of note included Kennedy, for whom Galliard in 1733 wrote a set of sonatas; Miller, who was to Burney ‘the best Bassoon I can remember’; and James Holmes (*d* 1820), who played in the première of Haydn’s *Concertante*. John Parry (ii) (1830) wrote of Holmes that his ‘tone resembled the most perfect human voice’ and that his ‘execution was as accurate as rapid’. In the 19th century the renowned James Mackintosh (1767–1844) was followed by the Paris-trained Belgian Friedrich Baumann (1801–56), who was brought over by the conductor Jullien. William Wotton (1832–1912) and his brother Thomas (1852–1918) were succeeded as the leading players by another notable pair, E.F. James (1861–1921), for whom Elgar (himself an amateur bassoonist) wrote his *Romance* of 1909, and his brother Wilfred (1872–1941). Writing in 1836, George Hogarth noted that ‘English performers, in general, use stronger reeds than foreigners, with a corresponding difference in the quality of their tone’ (*Musical World*, iii/38, 1836, p.180). He differentiated between a ‘strong, thick reed’ which ‘produces a great volume of tone; but the pressure of the lips which it requires prevents the attainment of smoothness and flexibility’ and a ‘weak reed’ which ‘is easily blown into; but the tone is feeble, and defective in roundness’. Hanslick (*Welt Ausstellung: Paris 1867*) also observed that the English (along with the French and Belgians) preferred very wide reeds, which in his opinion promoted ‘strength of tone at the cost of beauty’. The establishment of the German bassoon in England owes much to Archie Camden (1888–1979), who as a soloist helped popularize the instrument and trained a whole generation of players. Other influential teachers have included Karl Öhlberger (Austria), Karel Pivonka (Czech Republic), Maurice Allard (France), Albert Hennige (Germany), Mordechai Rechtman (Israel), Enzo Muccetti (Italy), Gwydion Brooke (UK), Simon Kovar and Sol Schoenbach (USA), and Roman Terëkhin (Russia).

Notable performers and teachers of our time include: Milan Turkovic (Austria), Gilbert Audin, Pascal Gallois (France), Sergio Azzolini, Dag Jensen and Klaus Thunemann (Germany), Masahito Tanaka (Japan), Valery Popov (Russia), and Norman Herzberg and Stephen Maxym (USA). ‘Period’ performers include Danny Bond, Michael McCraw, Milan Turkovic and Marc Vallon. Jazz bassoonists include Paul Hanson and Michael Rabinowitz.

9. The double bassoon.



Modern double bassoon by Wilhelm Heckel, Biebrich (private collection)

The modern double or contrabassoon (fig.8) is basically similar in construction to the bassoon. The normal compass extends from $B\flat$ to c' . Modern instruments, mostly of the 'compact' model, stand about 122 cm tall with a bore length of 5.5 m. Earlier models have a tall down-turning metal bell, for which a short bassoon-shaped wooden 'C' bell may be substituted when the lowest notes are not required. There are also models descending to A'' (or even $A\flat''$) which require an even taller extension bell. The reed, somewhat larger than that of the bassoon, can vary more than the latter in its dimensions; while some players use inflated bassoon reed dimensions, others alter the ratio of blade to shaft (as required by the model of instrument). The crook fits into a metal shank incorporating a tuning-slide and water-key. The contrabassoon is a transposing instrument, notated one octave higher than it sounds; in a few scores (Wagner, Debussy) its part is written at pitch. As with the bassoon, the crook is crucial as regards response, intonation and tone. The basic problem for the player is to produce a sound of good quality which will nevertheless 'tell' in a tutti passage. While the upper register is weak, it is in the lower register that the contrabassoon sounds at its best, lending a rich organ-like sonority to the full wind section. Brahms specified its use in his Requiem op.45, should no organ be available (letter to Hermann Levi, spring 1869). From the turn of the century, its orchestral role became more independent (works by Ravel, Schoenberg, Berg, Stravinsky, Britten, etc.). Works such as Schoenberg's *Kammersymphonie* op.9, no.1 and Berg's *Kammerkonzert* set new standards for the player. Modern scores often demand the player to double between bassoon and contra, a manoeuvre often requiring considerable dexterity. During the era of acoustic recording, the instrument proved an indispensable reinforcement for the string bass. Rarely, a pair is called for; Schoenberg in his *Gurrelieder* allowed the first player to appear in the unusual role of inner voice. Its use in a solo context is only a recent development. As early as 1922 Ervín Schulhoff scored his *Bassnachtigal* for unaccompanied double bassoon, partly for extra-musical reasons; more recently concert works have been written by Henk Badings, Victor Bruns, Ruth Gipps, Roger Smalley and Gunther Schuller. There are compositions for double bassoon and piano by Victor Bruns and Vítězslav Novák.

If the folding of 8' register pommers in the interests of commodity made sense, this was even more the case for 16' models. Larger members of the bassoon family have existed from the earliest period of its history; Zacconi (1592) referred to more than one size of dulcian and Praetorius (2/1619) listed an entire consort whose deepest members were two 'Doppelfagotte', the *Quartfagott* (G' to f, g) and *Quintfagott* (F' to e, g). The two larger dulcians in the Vienna collection correspond to the former. Praetorius also referred to a projected *Fagotcontra* by Hans Schreiber of Berlin which would be pitched one octave below the *Choristfagott* size of dulcian. The consort of dulcians in Augsburg contains one such instrument, of Italian origin, dating from the second half of the 16th century (see §2 above). The instrument is constructed of five sections, the glued tenons strengthened with ornamental bands. Of the four keys, the E and D thumb-keys are mounted one over the other. A flush pepper-pot lid similar to that of the *gedackt* dulcian is inserted in the bell (see Weber, 1991). Another early period *Oktavbass* instrument is at Dresden (Museum für Kunsthandwerke, Schloss Pillnitz). The other instruments known are two that are slightly later, now in the Schlossmuseum, Sondershausen (one is dated 1681; both are ascribed to Johann Bohlmann) which, aside from detachable bell are of one-piece construction. Four early octave bassoon models survive. One in Leipzig is signed A. Eichentopf, dated 1714. Another in Sondershausen is unsigned but attributed by Heyde to the same maker and tentatively dated to *ante* 1711 (Heyde, 1987). These are like a large version of one of Denner's bassoons and descend to B'' . An interesting example in the Museum Carolino Augusteum, Salzburg, by the Milanese maker Anciuti, is dated 1732. In England Talbot (c1695) mentioned a 'Pedal or Double Basson' descending to F' , which would appear to be a jointed version of the 'Quintfagott' of Praetorius. The famous London maker Thomas Stanesby (i) is reported to have made a double bassoon in 1727; a fine specimen in Dublin by his son (dated 1739) descends to B'' , is built like a large bassoon of the period with four keys, and stands 253 cm high. A contemporary advertisement refers to 'Two Grand or Double Bassoons, made by Mr Stanesby jun. the

greatness of whose sound surpasses that of any other Bass Instrument whatsoever'. The double bassoon is not referred to in England for several decades after 1803, and it is unlikely that any other such English instruments were made until the late 19th century.

In Germany the *Quartfagott* was more common than the true *Kontrafagott* pitched one octave below the normal bassoon. Bach used the former in the cantata *Der Himmel lacht! die Erde Jubiliert* BWV31 (1715), and in his *St John Passion* a 'continuo pro Bassono grosso' part is mentioned. Some works (e.g. the cantata *Nach dir, Herr, verlanget mich* BWV150) which contain passages descending to written *A'* were transposed so as to enable old *Chorton* instruments (bassoon, organ) to play with newer low-pitch woodwinds. *Kontrafagotte* were included in German and Austrian military bands towards the end of the 18th century and were used occasionally in the orchestra when available. Mozart wrote a part for *gran fagotto* descending to *C'* in his *Maurerische Trauermusik* K477/479a (however, his Serenade for 13 wind instruments K361/370a specifies *contrabasso*, i.e. string bass). By 1807 the Vienna court orchestra included a double bassoon, and Haydn and Beethoven made use of it in their larger works.

During the 19th century, experiments were made by many different makers to develop a satisfactory double bassoon, mainly to satisfy the need for a powerful contrabass-register instrument in the military band. One type developed was of metal, with a closed key for each note; the earliest maker was Stehle of Vienna, who exhibited his 'Harmonie-Bass' there in 1839. It measured 169 cm and its 15 keys were operated singly like those of the ophicleide giving a range of two and a quarter octaves from *E♭*" to *g*. Six of these instruments survive, of which two are in Budapest, and one each in Leipzig, Nuremberg, Paris and Toronto. Later models were more compact: these included Červený's 'Tritonicon' of 1856 and Moritz's 'Claviatur-Kontrafagott', which was fitted with a keyboard like that of a piano-accordion. A version by Mahillon from 1868 was called 'contrebasse à anche', and later on similar instruments of this name (Eng. reed contrabass; Ger. Rohrkontrabass; It. contrabbasso ad ancia) were produced for military bands in France and Italy. The deepest of all was Červený's 'Subkontrafagott' of 1867 which descended to *B♭*". Another solution was to widen the bore. Haseneier's wooden 'Contrabassophon' of 1847 had a bore which flared from 6 mm to over 10 cm and tone holes of exceptionally large diameter. It had 19 keys covering all holes and its range extended down to *C'*. Since the tube was in four sections, the overall length of the instrument was only 140 cm; it was considered a success and was copied by several makers. Some models, such as that of Berthold in 1875, were made in papier-mâché to lessen the weight; W.H. Stone brought one such to England, where it was copied by Morton. However, the open and not easily controlled tone of all these instruments, while acceptable in the military band, was not suitable for the orchestra. The contrabass sarrusophone which later replaced them in France is still found occasionally and appears in some scores by Ravel, Debussy and Delius.

However, it was the achievement of the Heckel factory to bring about the development of the modern instrument. For the preceding years the double bassoons outwardly resembled a large bassoon with a long looped metal crook; their range descended to *D'* or *C'*. In 1875–6 J.A. Heckel redesigned the instrument, retaining its narrow bore but disposing it into three separate wooden tubes; it was held on the left of the player's body and its range descended to *C'* (it was patented in 1877 by Heckel's foreman Friedrich Stritter). In 1879 an improved model was made which was held and fingered conventionally; Wagner praised its new-found ability to play smoothly, and subsequently employed it in *Parsifal*. For the first time the instrument was comparable to the bassoon in tone and general response. Later a down-turned metal bell was added, extending the range to *B♭*", and after 1900 to *A*". All subsequent instruments have been based on these Heckel models, including a version by Buffet-Crampon with French-system keywork introduced in 1906.

10. Other sizes.

The family of dulcians as described by Praetorius included three progressively smaller sizes which he called *Diskantfagott*, *Altfaagott* and *Fagott Piccolo* or *Singel Corthol*. A set of four small dulcians, of Spanish provenance and listed as *bajoncilli*, is now in Brussels. An early incidence of scoring for such an instrument is by Flaccomio (*Liber primus concertus*, Venice, 1611), marked 'con basoncico alias fagotto piccolo'. Ever since the appearance of the jointed bassoon, smaller-

sized instruments have continued to be built by every bassoon maker of note; their survival in surprising numbers is perhaps explained by their lack of serious use. They can be divided into two categories. The more usual type of tenor bassoon pitched in F (a 5th higher than normal) or occasionally in G or E \flat , was also known as the 'tenoroon'. This name, presumably a contraction of 'tenor bassoon', appears to have been originally applied to the alto oboe, and Stone in *Grove 1* misleadingly confused the two instruments. The French name for this type, *basson quinte*, should not be confused with the *Quintfagott* of Praetorius, the large dulcian which descended to F. The second type, pitched one octave higher than normal, is named 'octave bassoon' or 'fagottino'. A fine early specimen, 63.6 cm tall, by J.C. Denner, is in Boston.

The only known early works for small bassoon are a mid-18th-century wind parthia by J.G.M. Frost, which includes parts for two *fagotti-octavo* and two *fagotti-quarto*, and a cantata by F.W. Zachow, which includes *bassonetti*. In France a small bassoon was reportedly used about 1833 at the Bordeaux opera to replace the english horn; Larousse (1865), comparing the two instruments, considered that the tone of the *basson quinte* had greater force and penetration. Later it was used occasionally in the military band; Buffet-Crampon exhibited three new models in 1889 and Morton made some in London.

As a solo instrument, the small bassoon had long been used by such recitalists as Eugène Jancourt and E.F. James. In 1992 Guntram Wolf (Kronach) built the first tenor bassoon in modern times for the English player Richard Moore, who subsequently commissioned Victor Bruns to write for it. Another significant use has been as an instrument for young beginners: Almenraeder recommended starting ten-year-olds this way – the age at which Bärmann began his studies with Ritter. The same practice was reported in the Foundling Hospital of London and more recently in the band of a Sicilian orphanage. Since 1992 Wolf, followed by Moosmann and Howarth, has developed successful models for the seven- to ten-year-old age group.

The name 'Caledonica' was given to a modified version of the octave bassoon invented about 1825 by the Scottish bandmaster William Meikle; it had a wider flaring bore and was played with a small clarinet mouthpiece. An improved model was subsequently developed by the London maker George Wood which he called the 'alto fagotto'.

Bibliography

A Pedagogical. B General. C Early history (to 1800). D Construction and makers. E Repertory and performers.

A: Pedagogical

LaBordeE, 323–43

Compleat Instructions for the Bassoon or Fagotto (London, c1770)

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