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Early Bassoon Fingering Charts*

In its purest form research on the early bassoon should attempt to understand the instrument in terms of its own acoustical design and within the musical context of its individual period. This is a particularly difficult problem with the bassoon for any one of a number of reasons. To begin with, relatively few instruments survive from the bassoon's developmental period during the seventeenth and eighteenth centuries. Most surviving bassoons lack a crook and reeds, and even in the rare circumstances where an old instrument has been found in what seems to be original working order (with associated case, reeds, and crook) it cannot be absolutely presumed that the tuning and pitch standards of the instrument were not altered through a form of woodwind ravalement to adapt the instrument for use in a later period.[1] Surviving historic crooks and reeds are relatively rare, often shortened, and mostly late eighteenth century. It appears from the written and physical evidence that reeds were radically different in construction, application, and conception from the standard practice of today.[2] The most striking of these differences concern the greater size and internal scrape of these reeds, both of which are totally foreign to the player of the modern bassoon. In turning one's attention to written sources it becomes clear that evidence about all aspects of the early bassoon, at least before the last quarter of the eighteenth century, is scant, with what little information there is often being vague, contradictory, and confusing.

In order to recreate an historically correct sound and response on an original bassoon one needs the basic instrument, the crook, and the reed designed for it. This is also dependent upon recreating the original player's concept of embouchure, sound, reed style, and breath support. If one is to refine any one of these components there must be stability in all the others. To rediscover the historical correctness of any one of these components each must first be isolated within this same context of stability. This is the core of the problem with research on the early bassoon – so little trustworthy information exists which provides a secure and controlled base to work from. The reeds and crooks are lost, the surviving bassoon altered in subsequent periods, and the players'

* For early oboe and clarinet fingerings, see *GSJ* XXXI (1978), p. 68; and *GSJ* XXXVII (1984), p. 16. – Ed.

tradition of technique and performance interrupted, and now lost. With so many unknowns, variables, and modern preconceptions it is hard to know where to begin piecing together the puzzle of how and where the early bassoon was developed, what it sounded like, and at what pitch and temperament it was tuned. Yet without answers to these questions it will be difficult to refine our application of individual instrument types to specific repertoire.

There is one area, however, where written evidence exists in large enough quantities to provide a firm basis of study – historic fingering charts. About fifty tables published between the mid-seventeenth and mid-nineteenth centuries have survived.[3] This body of work constitutes an overview of the development of the instrument during its formative period, while also marking the appearance of national styles of instrument building and the isolated eccentricities of individual instrument makers and players.

Apart from their obvious practical application, fingering patterns are also an acoustical record of the bassoon within a specific musical era. There is a logic and sequence to tuning a bassoon. The sequence chosen may generally improve the upper, middle, or lower portion of the instrument's range or specifically strengthen notes within a scale. The focus of this action becomes the tuning of individual vent holes, each of which has two functions: the first is to create a fundamental tone and the second is to influence the other tone holes. The changing influence of a vented tone hole is reflected by alterations in fingering patterns. One can infer from such changes recorded in the charts a prejudice for a particular temperament, a trend towards equal temperament, or a historical change in musical application of the instrument. 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.

THE TABLATURE

Bassoon tablature was presented in a variety of ways during the period we are concerned with here. In all cases a system was devised which linked fingering patterns to specifically notated pitches. Some of these are quite easily read, others much less so, and others with great difficulty. Seventeen charts (the earliest dates from 1738) are accompanied by illustrations of instruments, some of which bear strong resemblance to surviving specimens of a known maker or a type of bassoon. Almost all of the fingering tables are accompanied by some form of text; usually an explanation of how to utilize the chart or an

addendum on technique, or both. In a few instances we are given the name of the author or editor, though more often it is the case that one can never be absolutely sure about the context (intended audience of the publication), reliability (printing errors), and authorship (professional vs. amateur) of these charts. There is firm dating for most of these publications, but ascertaining whether the information is current or long out of date can be problematic. When information is at its best, it is specific to a period and location within a few years of publication; at its worst, it can be out by decades. Much of the information gleaned from these charts cannot stand alone without careful cross-reference against research and experimental data yet to be understood through the contemporary performance of the early bassoon. This will require the cooperation of the performer, builder, and researcher all working together to understand how performance practice, instrumental technology, and period repertoire reflect each other. Only then will there be a clearer, more useful picture of the evolution of the bassoon during its formative centuries.

THE FUNCTION OF THE KEYS

The vented holes under the key mechanisms on the bassoon perform dual functions. Key mechanisms were primarily added to eliminate the need for lipping or awkward crossed and half-holed fingerings in the production of solid fundamental pitches. They also perform a secondary function in assisting to colour and tune other notes, an aspect which will be discussed later in this paper.

In naming keys one must distinguish between an operational name for that key and the name of the tone-hole influenced by the operation of that key. For example (see Fig. 1 *(a)*): the key with the operational name of 'D' is so called, because when it is depressed (with all vents above closed) it closes the E-vent hole and produces the low *D*. Operation of this key's head closes the hole which has been tuned to produce the low *E*. This action negates the influence of this hole by channelling wind further down the bore (from the reed end) where it is vented through the hole adjacent to the D-key touch. This hole serves as the D vent, but is called the C hole (operational name), because it is the last hole stopped in the fingering pattern which produces the lowest *C* on the instrument. The distinction between operational and vent name has historically been a source of confusion in composing fingering charts. In order to eliminate this confusion in the following sections on the charts, keys and holes will be named in the most traditional manner by their operational name; that is, by the pitch produced when the key is operated or finger-hole closed. However, before covering this, both the

operational and venting names will have to be used in a discussion about the secondary function of the keys.

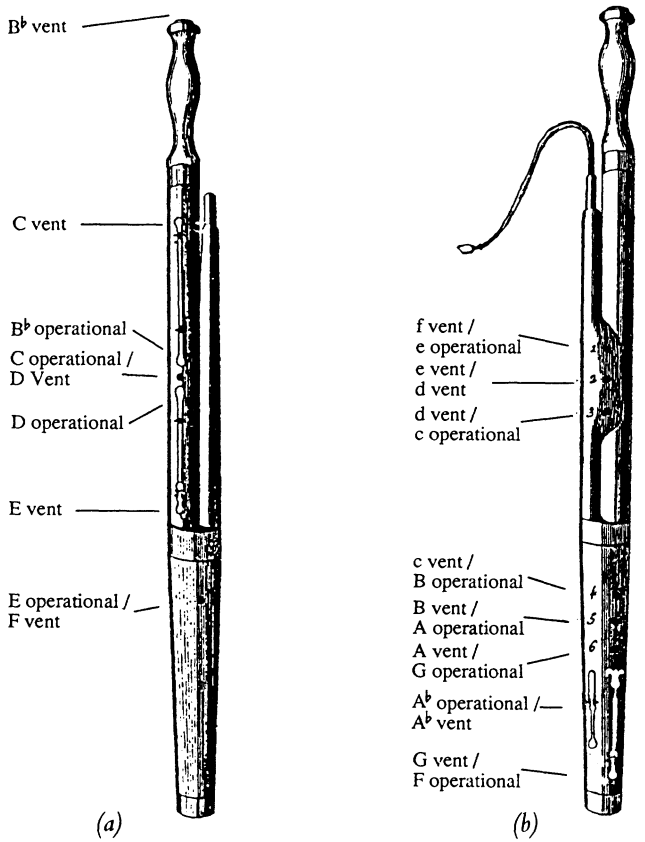

FIG. 1. *Diderot, source 10.*

In its fingering, the bassoon is essentially an extended oboe. The four-keyed instrument has a tenor side consisting of six finger-holes and two keys (like the two or three-keyed oboe), which overblows at the octave and ends at the E hole (F vent) in the same way that the oboe ends at the bell. The bass section consists of the remainder of the butt joint, the bass joint with two keys and a fingered hole, and a bell. The entire length of this section of tubing extends the range down by a fifth. This added length of tubing gives the bassoon an advantage over all other early woodwinds through the influential application of keys and holes from the bass side to overcome difficulties with pitch, articulation,

dynamics, and timbre on the tenor side of the instrument.[4] The influence a key makes when added to a simple fingering is relative to its distance from the last vented hole of the fingering, the harmonious or dissonant nature of the overtone series of the two, and the proportional balance (increased or decreased) of wind redirected to either side of the hole stopped by the key. An example of this is the addition of the A♭ key to the simple *C♯/D♭* fingering (124). Depression of the key reinforces harmonics of the fifth of the desired *C♯/D♭* by venting the *G♯/A♭* position on the bore. At the same time the added 'leak' through this hole destabilizes (thereby lessening) the influence of hole 3 (D vent), hole 5 (B vent), hole 6 (A vent), F key (G vent), E hole (F vent), and to a lesser degree, all vents below.[5] Usually the effect is to centre and purify the tone, while raising the pitch slightly by the extra venting. However, because of the complex and highly inconsistent acoustical nature of the bassoon, neither this nor any other explanation to follow can be assumed to be universally true for all instruments.

THE HISTORY AND FUNCTION OF EACH INDIVIDUAL KEY

The B♭ (for the low *B♭*)

The concinnous beauty of the Renaissance precursor to the bassoon, the dulcian, was the compact efficiency of its one-piece construction. Its form was such that tone holes were naturally positioned along a doubled-over bore so as to allow the thumbs and fingers to oppose each other comfortably. The decision to lower the range of this instrument to the *B♭′* below the bottom *C* provided the impetus which required the scrapping of this design and its replacement by an entirely new instrument, the bassoon. In order to reach the bottom *B♭′* on the dulcian, while preserving the bore characteristics of the instrument, the bell would have to be lengthened by about a third again of the length of the body. Not only would this imbalance have placed too much stress on the wooden tenon, but adding the necessary amount of extra tubing on one side of the instrument would have negated the efficiency of the one-piece design. Any solution to these problems would have to take into account the need to position holes and keys within reach of the thumbs. The historical resolution was a multi-sectioned instrument with a lengthened, less-tapered bore, and repositioned bass note tone-holes and keys – among these the B♭ key. The sectioning of the instrument was to prove revolutionary to the production and improvement of the instrument. The use of four smaller sections must have lowered material costs, facilitated individual section replacement, and permitted localized experimentation within the bore.

The B♭ key has other functions apart from producing the fundamental note of the instrument. It can also be helpful when applied to simple fingerings in the tenor and treble ranges. In particular it is useful as a mute and in assuring attack in quiet passages. Additionally, this key can also be used to colour and stabilize pitches.

Among modern players of early bassoons (and makers of replicas of them) there is speculation that the key is, in some cases, a low *B′* natural. This question arises because the bottom note on some original bassoons from the eighteenth century is uncentred and flexible in nature. Often this pitch lies a semitone below the low *C*, indicating an inbuilt preference to 'lip' down to a *B♭′*, rather than 'pinch' to a *B′*.

The D Key (for low *D*)

The low D key appeared on the first bassoons as a result of the shift of tone holes around the newly lengthened bore. On the dulcian the low *D* was produced by the thumb closing a hole on the back of the butt, forcing air through the hole controlled by the other thumb further down the bore. With the change from the dulcian bore the D vent was moved roughly halfway between the two thumbs and operation shifted to a long key controlled by the left thumb on the bass joint.

This key becomes an important asset when added to simple fingerings: it influences and corrects many pitches above. Rather than muting notes as the B♭ key does, it tends to open them up by colouring, increasing resonance, or centring the tone. Depending upon the instrument and particular note, this can be the most effective way of correcting a note that is slightly off-pitch. It is particularly helpful in producing a pure-third *c♯* (124D) and an alternate overblown *g♯* (123456D). Before the advent of the wing key the D key performed a similar function in producing pitches in the upper reaches of the range.

The F Key (for the low *F*)

The function of the F key on the bassoon and dulcian is to close the gap between the bass and tenor bores of the instrument. Apart from its obvious function in producing the low *F* pitch, its influence is felt mainly in the third octave of the instrument (*f* upward) or in the middle octave *f* where it acts to stabilize the notes.

The A♭ Key (for A♭/G♯)

The fourth key added to the bassoon, probably about the beginning of the eighteenth century, was for the *A♭*/G♯.[6] This step marks the point at which the bassoon departs completely from the dulcian tradition

by eliminating the constraint of the archaic half-holed fingering for this note (12345, ½ 6).

The A♭ key can be of great assistance in determining the age of an instrument. The earliest examples of this key are very short in length and have a small vent hole positioned high (closer to the reed end) on the bore (see Fig. 1 *(b)*). During the course of the eighteenth century the position of this key migrated down the butt joint to a position at first parallel to, and eventually below, the F (operation/G vent) hole (see Fig. 13). The A♭ vent-hole grew correspondingly in size during this period and moved further down the bore, away from the A vent and towards the G vent. These two trends probably represent changes in temperament which eventually resulted in the consolidation of *A*♭ and G♯ as the same pitch. English bassoons seem to be the only exception to this rule: their short, high-positioned keys continued well into the nineteenth century (see Fig. 14). In the following sections the key is designated A♭ rather than G♯ because the majority of charts would have had the early, short form which held a high position on the bore corresponding to the sharper of the two pitches (in meantone).

A secondary use of this key is to raise low centred pitches; most often to bring up the forked B♭s and C♯s. Many late eighteenth century French instruments appear to have an equal tempered B♭/A♯ by using this key with the *A* Fingering (12345A♭).

The E♭ Key (for the low *E*♭/*D*♯)

In almost all cases the fifth key added to the bassoon was for the lowest *E*♭. The earliest firm dating for the appearance of the key is on J. M. Hotteterre's fingering chart of *c.*1765. In France, where the E♭ key was probably first applied, the five-key bassoon seems to have been relatively shortlived as the six-keyed instruments appeared within a decade.[7]

The placement of the E♭ key is usually a reliable indicator of a particular national style. The French builders fit the key on the inside (between the D touch and the wing joint: see Figs. 8, 9 or 10), the English on the outside (to the left of the D touch as it is faced: see Fig. 14), and the Germans placed the touch on the back side of the bass joint, to be operated by the little finger of the left hand (a position continued through the Heckel system today: see Fig. 15). German placement is thought to have been originated by one of the Dresden builders, H. Grenser. The Viennese makers often positioned the key like the French.

The E♭ key is rarely used in fingering charts for anything other than producing the fundamental low *E*♭, but it can be used in the same capacity as the low D key to shade, raise, or lower pitches.

The Wing Keys: W and W2

A single wing key on the wing joint, designated the 'A' key on some charts, was the sixth key added to most continental instruments. On his 1787 chart, Etienne Ozi describes the six-key instruments of Prudent (*c.* 1760s) and Bizey (died 1762) as representing the *'Ancien'* type; this at a time when five and six-key bassoons were just being introduced into other parts of Europe. In examining P. Cugnier's extremely high fingerings, published by La Borde, or the four-key chart by Reynvaan, it would appear that this wing key is not absolutely essential for the production of high notes on a well balanced four or five-keyed bassoon. If the instrument were not perfectly tuned, and also considering the ever-present danger of an unreliable reed, such a key provided needed insurance in tense performance situations. There are many existing examples of what are basically standard five-key instruments fitted with two wing keys during a later period (this second wing key is sometimes designated in charts as the high 'C').

Wing keys serve as 'speaker' keys for pitches above *g′*. When introduced at the end of the eighteenth century they eliminated the need for complicated cross-fingerings to produce high notes. This then allowed a more refined tuning of the tone-holes for notes in the lower octaves by relieving them of the need to perform an acoustical double-duty.

The Right-Hand Thumb Key: Rt

This key has often been misnamed as the F♯ key. Its first mention is in Ozi's 'moderne' chart of 1787 for the seven-key instrument. He is quite specific about the key's use in the high *b″* and *b♭″* fingerings, and cites it also as an aid in raising a low centred G♯. Nowhere in any eighteenth century chart is there an indication of the key's use in producing *F♯*. Indeed, most French instruments equipped with this key – until and including the late instruments of Savary – have solid, traditionally fingered low *F♯*s (123456E). The misnomer probably arose from a familiarity the pioneering organologists had with late eighteenth and early nineteenth-century English bassoons.[8]

THE NUMBERED AND LETTERED HOLES

Holes 1–6: 123456

The first six holes are numbered in sequence beginning with hole one at the reed end. Of these, the first hole requires the most subtle operation by a careful half covering of the hole (half-hole) in order to provide a reliable *f♯*, *g*, and *g♯*.

Combinations of holes four, five, and six can be used to stabilize, raise, or lower pitches. These are most often used to correct *f*, *f'*, and *d'* weaknesses on individual instruments.

The E Hole (for the low *E*)
The right-hand, thumb-covered E hole (E operational/F vent) is most often used to raise the one-fingered *e*, to clarify the forked B♭s, and solidify the second octave *a*.

The C Hole (for the low *C*)
The low *C* hole is sometimes employed as a mute like the B♭ key, but it has a less pronounced influence.

FINGERING CHARTS

In the two sections that follow I have displayed the charts in a manner which should prove useful to the musician, historian, and builder. In the first section all known fingering patterns for the bassoon have been collated into one easily read chart.

For each individual pitch a 'standard' fingering pattern is first listed. These have been compiled from the simplest, most frequently used fingering for four-keyed bassoons. Below each 'standard' pattern, are listed all the known alternative fingerings which deviate from that norm, each being followed by an abbreviated reference to the first known source of such a deviant pattern (see Guide to abbreviations).

The 'Collation of all charts' table is followed by a much larger section detailing the chart sources and the individual fingerings from each which deviate from the standard patterns. As these chart sources are grouped chronologically and according to the number of keys involved, they are not in alphabetical order; but they can be located quickly by referring to their numbers, which are given (in parentheses) in the Guide to abbreviations.

GUIDE TO ABBREVIATIONS

AC	Apollo's Cabinet (11) exception to MB
AD	Anonymous Dutch (14) exception to LL
BERG	Berg (16)
B	Berlin (9)
BER	Bertini (42)
CAL	Callcott (20)
CIT	Citadel (12) exception to D
D	Diderot and d'Alembert (10)
DUL	all dulcian charts: Speer (1), Eisel (2), and Reynvaan (3) (modern spelling Reijnvaan)
EICH	Eichstätt (29)
E	Eisel four-key (8)
EL	Eley (46)
F	Fröhlich eight-key (44)

G	Gehot (22) exception to LL
HB	Hotteterre (24) and Bailleux and Abrahame (25)
K	Klein (21)
LB	La Borde and Cugnier (26)
LL	Longman and Lukey (13), Preston, Anonymous Dutch, Royal Encyclopaedia, and Gehot. Exceptions: PRES (17), AD (14), RE (18), and G (22)
M	Majer (5)
MB	Musica Bellicosa (6) and Apollo's Cabinet: exception AC
PREL	Prelleur (7)
PRES	Preston (17) exception to LL
O	Ozi 1787 (ancient) (27)
O2	Ozi 1787 (modern) (38)
O3	Ozi 1803 (39) and all reprints thereafter (40, 41, 47)
R	Rees (43)
R4	Reynvaan four-key (19)
R6	Reynvaan six-key (28)
RIT	Ritter (33) and Böhm (35)
RE	Royal Encyclopaedia (18)
SA	Sauer (45)
S	Schwartz (37)
SCH	Schneider (23)
T	Tan'sur (15)
TA	Talbot (4)
US	American sources: Shaw (32), Herrick (31), Holyoke (30), Whitely (34), and Goodale (36)

KEY NOMENCLATURE (see Fig. 1)

B♭	B♭ key operated by left thumb
C	hole covered by left thumb (D vent)
D	D key operated by left thumb (E vent)
E♭	E♭ key operated by left thumb (E♭ vent)
E	hole covered by right thumb (F vent)
Rt	key operated by right thumb
A♭	key venting A♭/G♯ operated by right little finger
F	F key operated by right little finger (G vent)
W	wing key operated by left thumb
W2	additional wing key
123456	finger holes numbered in sequence
½	hole half covered

COLLATION OF ALL CHARTS

A′	slackened *B*♭	D, R6, O2
B♭′	123456FEDCB♭	(standard)
	not listed	T
B′	123456FEDCB♭	D, O
	123456FEDE♭CB♭	R6
	123456FEDCRt	S
	slackened *C*	BER
C	123456FEDC	(standard)
	123456FEDE♭C	R6 (error?)

C♯/D♭	123456FED(½C)	(standard)
	pinched *C*	MB, CIT, F
	123456FEDB♭	PREL
	123456FEDC	R6 (error?)
	slackened *D*	AC, EICH, BER
	none listed	LL, E, T, SCH, AD, R, SA, EL
D♭	123456FA♭ED	T (error?)
D	123456FED	(standard)
	123456FEE♭D	R6 (error?)
D♯	123456FEE♭	RIT (error?)
D♯/E♭	123456FEDB♭	(standard)
	123456FEB♭	MB, K, SCH
	123456FE(½D)	M, DUL
	123456FEC	PREL
	123456FCB♭	R4, LL, AD, P
	123456FECB♭	CAL, F
	none listed	T
	123456FEDE♭	Standard for all instruments with five or more keys
	123456FE♭CB♭	R6 (error?)
E♭	123456FEB♭	RIT (error?)
E	123456FE	(standard)
	123456FEE♭	R
F	123456F	(standard)
F♯/G♭	123456E	(standard)
	123456FB♭	O3
	123456FRt	US, F, R, SA, EL
	none listed	T
	123456EB♭	F (alt.)
G	123456	(standard)
	123456Rt	El
G♯/A♭	123456A♭	(standard)
	12345(½6)	DUL, M
	123456A♭Rt	O2, R
A	12345	(standard)
A♯	12345A♭	EICH
A♯/B♭	12346	(standard)
	12346A♭	B
	12346D	O2, BER (alt.)
	12346EB♭	O3, F (alt)
	12346A♭Rt	R
	12346E	EL
B♭	12346	EICH

B	1234	(standard)
	12356A♭	F(alt.)
	1234A♭	R
	123456E	EL(error)
	1234	EL(alt.)
c	123	(standard)
	123F	F(alt.)
	123A♭	F(alt.)
c#	124	(standard)
	124A♭	PREL, LL, AD, CAL, O, O2, F(alt.), BER, R
	124FE	US
	1346F	EL
d	12	(standard)
	12A♭	F(alt.)
d#/e♭	13	(standard)
	1346	B
	13A♭	RE, F(alt.)
	12456	R
e	1	(standard)
	1A♭	F(alt.)
	16	O3, F(alt.)
f	open	(standard)
	2	DUL, M, E, R4(alt.)
	3	LB, F(alt.)
	A♭	LL, AD, CAL
	2A♭	RIT
	456	F
	456F	F
f#/g♭	23456F	(standard)
	23456	M
	open	E, R4(alt.)
	23456FCDB♭	PREL, LL, AD, CAL, RIT
	456FE	LL, AD, CAL
	123456FRt	F
	23456FRt	SA(alt.)
g	123456	(standard)
	23456A♭E	LL(error?)
	23456	PREL, D, AD, T, LB, O, RIT, O2, BER, EL
g#/a♭	123456A♭	(standard)
	12345(½6)	DUL, M
	23456A♭	LL, AD, O2, BER
	23456A♭D	O3
	123456D	F(alt.)
	123456A♭DC	R

a	12345	(standard)
	12345FRt	F (alt.)
a♯	12345A♭	EICH
a♯/*b*♭	12346	(standard)
	12346A♭	R4 (alt.)
b♭	12346	EICH
b	1234	(standard)
	12356	F (alt.)
	1234A♭	R
c′	123	(standard)
	123A♭	F (alt.)
c♯′	124	(standard)
	124A♭	MB, PREL, D, LL, AD, CAL, O, RIT, O2, F (alt.), BER, R
	12346	R4 (alt., probable error)
	12356F	EL
d′	12	(standard)
	12A♭	F (alt.)
d♯′	13	O, O2, RIT
d♯/*e*♭′	13	(standard)
	13A♭	G
	13	B (alt.), R4, SA (alt.)
	13W	R6
	12456	B, LL, R4 (alt.), CAL, US, F, R, SA, EL
e♭′	12456	O, RIT, O2
e′	1	(standard)
	1245	B, AD
	1W	R6
	1A♭	F
	13456	F (alt.)
	13456A♭	O3
	1456	O2, O3, F (alt.), EL
	1456A♭	O3, F (alt.)
f′	open	(standard)
	open W	R6, F
	2	DUL, M, B, R4, F, SA (alt.)
	145	B
	6	LL, AD
	456	LL, AD
	2456	AD, F, SA
	12456F	PRES
	23456A♭	HB
	2345	LB
	2456A♭	O, BER
	1456A♭	O2
	2456A♭E	EL

f#/gb′	open	MB
	234	PREL
	234F	T, K, SCH
	23456F	B, AD, R4 (alt.), HB, SA
	2345F	D, O, O2, BER, F
	2345FB♭	O3
	234A♭	LL, CAL
	2456F	R4, R6
	23456	LB
	245A♭	EICH
	456FE	US
	2346F	F
	2345FB♭	O3, F
	234A♭E	R
	2346A♭E	EL
g′	23	MB, CIT, T (72)
	23F	PREL, T (29), K, SCH
	23456	B
	123	D
	23A♭	LL, CAL, US
	234F	AD, EICH, S, SA, F
	234A♭	R4
	234FA♭	R4
	234	HB, O, O2, BER, F
	2A♭	LB
	234A♭E♭W	R6
	236F	F
	234B♭	O3, F
	23A♭E	R, EL
	2346F	SA (alt.)
g#/ab′	123B♭	D
	234F	T (29)
	2345A♭D	R4
	235A♭FD	R4
	12F	K, SCH
	123	HB
	123D	LB
	23D	O, O2, BER
	235D	O3
	235A♭DE♭	R6
	23F	EICH, SA
	234FE	US
	123456D	S
	12346D	S
	23F	F
	23A♭	F
	123A♭W	R
	236F	SA (alt.)
	123W	EL

a′	12B♭	D
	12D	HB, LB, O, EICH
	12DA♭	R4
	12DA♭W	R6
	1DW	S
	12DW	S
	2DW	S
	2356A♭DE♭	O2, O3
	23W	O2, BER, SA
	123DW	F
	2356A♭DW	F (alt.)
	23E♭	F (alt.)
	123W2	R, EL (alt.)
	123W	EL
	23D	F
	23A♭	F
a#′/b♭′	123456FA♭D	LB, R4, F
	123456FDW	O
	123456FA♭DE♭W	R6
	12456FDW	EICH
	123456FCW	S
	123456FRtDW	O2, BER
	123456FA♭DW	F (alt.)
	123456FW2	EL, R
	23WW2	SA
b′	2345FA♭D	R4
	1245FA♭D	LB
	1245FW	O
	1245A♭FDE♭W	R6
	1245FDW	EICH
	1245FDE♭W	S
	1245FRtW	O2, BER
	12345FA♭D	F
	123456FA♭DW	O3, F
c″	1245FEDC	LB
	124FDW	O
	A♭	R4
	E♭A♭W	R6
	124FEDW	EICH, BER
	14FDE♭W	S
	1FDE♭W	S
	124FEW	O2
	1245FECW2	F
	124FEDW2	F

c#′	124	LB
	1W	O, O2, BER
	14FEDE♭W	S
	1FEDE♭W	S
	124EDW2	F
	1W2	F
d″	15	LB
	W	O, O2, BER
	DE♭W	S
	1W2	F
	W2	F
e♭″	OPEN	LB
e″	2(3)45EDCB♭	LB (printing indistinct)
	W2	F
f″	24	LB

DEVIANT FINGERINGS OF THE INDIVIDUAL CHARTS

(Reminder: All the fingerings in these charts are exceptions to the standard fingerings given above.)

FOR THE DULCIAN (two-keyed)

Richard Semmens makes a strong case for the bassoon's divergence from the dulcian family before the publication of Marin Mersenne's *Harmonie universelle* of 1636, and claims that the bassoon was the first of the Baroque woodwinds to be sectioned.[9] In the early seventeenth century the dulcian was an integral part of mixed consorts containing cornetti, sackbutts, recorders, and strings, but by the end of the century it had become a sophisticated solo instrument,[10] with compositions owing much to the Renaissance wind tradition of improvised diminution and tongued articulations.[11] When the bassoon was introduced outside of France during this same period it seems to have been distinctly considered as part of the oboe consort, being consistently referred to as *'basse du hautbois'*. Traditionally, the dulcian was thought to have quickly disappeared after the invention of the bassoon; however, evidence shows that the dulcian coexisted with the bassoon well into the eighteenth century, and as late as the twentieth century in Spain.[12]

1. *Grundrichtiger Unterricht der musicalischen Kunst* . . ., by Daniel Speer (1636–1707). Ulm, 1687.[13]

Speer published this tutor in 1687 (expanded in 1697) during the period when the new French woodwinds were being introduced to Germany. However, the bassoon was not treated in the text, implying that it was still a relatively unknown instrument there. (W 25.)[14]

Notation: D♯, F♯, G♯, B♭, C♯
Compass: *C* – *f′*

D♯	123456FE(½D)
G♯	12345(½6)
f	2
g♯	12345(½6)
f′	2

2. *Musicus Autodidaktos*, by Johann Philipp Eisel. Erfurt, 1738. (See no. 8 below for four-key bassoon chart.)

This chart is identical to Speer's, though by this date described as being for an obsolete instrument: 'German Bassoons, Fagotte, or Bombardi . . . are not used any longer, and that is why it is unnecessary to spoil paper for the description of them. However those who are enthusiastic about the olden days, can gain some good information on the illustration above'.[15] (W 71.)

3. *Muzijkaal Kunst-Woordenboek*, by J. V. Reynvaan. Amsterdam, 1795. (See nos. 19 and 28 below for four- and six-key bassoon charts.)

What is interesting about the inclusion of this chart (identical to Speer) is that its date of publication is more than two hundred years after the invention of the instrument and eighty years after the time the instrument was fading from the mainstream of musical culture. Perhaps Reijnvaan (the modern spelling for Reynvaan) was supplying tutors to the cathedral bands in Spain or South America at this late date.

FOR THE BASSOON

THREE-KEY

4. James Talbot Manuscript (Christ Church Music MS 1187). Oxford, *c.*1684–95.[16]

The chart for the bassoon in Talbot's incomplete musical encyclopedia is a fragment showing fingerings for only low *B*♭′, *C*, and *D*, however it is useful in explaining other aspects of contemporary English double reed playing.[17] Talbot's nomenclature indicates a migratory pattern from France for the instruments mentioned, with chart space allotted to the four-piece bass of the 'French Hautbois' under the sub-heading 'Basson and Pedal or Double Basson' (note the French spelling). These instruments are in addition to the one-piece bass of the indigenous 'English Hautbois', sub-headed as the 'Fagot' and 'Double Fagott' (i.e.

the dulcian family). In examining this inventory of what are basically Renaissance wind instruments it is clear that the French bassoon and oboe were the first of the 'new' Baroque instruments introduced to England. From this one might assume that the musicians of Purcell's time would have used bassoons of French design at the low chamber pitch of approximately $a'=392$.[18] Of particular interest is the mention of a contra-bassoon (this French instrument clearly distinguished from the bass curtal) at such an early date, because the earliest surviving contra-bassoons, both by A. Eichentopf, date from *c.*1714. (W 26.)

Compass: Basson *B*♭′, Double-Basson *F′* (upper ranges not given)

5. *Museum Musicum Theoretico Practicum*, by Joseph F. Majer (1689–1768). Nürnberg, 1732.[19]

This chart was published in a tutor which contained self-instruction methods for most on the instruments used in Southern Germany during the early Baroque period. It is illustrated with a bassoon of impossible design (see Fig. 2) having keys and holes of the bass joint superimposed on the wing. This instrument is vaguely Denneresque in form, but is fitted with three keys at a time when Jacob Denner was probably producing four-keyed instruments locally. Instruments of a similar style (likely derived from French designs of an earlier period) would have been played in Bach's pre-Leipzig orchestras.[20] What is most noteworthy about the fingerings in this chart is that they are clearly indebted to the dulcian, sharing the G♯ and *D*♯ patterns. (W 65.)

Notation: B♭, C♯, D♯, F♯, G♯

Compass:	*B*♭′ – *f*♯′
D♯	123456FE(½D-key)
G♯	12345(½6)
f	2
f♯	23456 (error?)
g♯	12345(½6)
f′	2
f♯′	13 (error?)

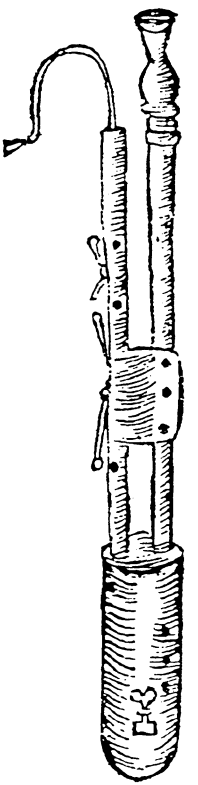

FIG. 2

Majer, source 5.

6. *Musica Bellicosa*, published by Walsh. London, 1730.

This chart is the earliest completed source we have for the bassoon (English spelling) in England. It shows a clear preference for certain accidentals over others, which in turn might imply preferred key signatures and an unequal temperament. Fingerings for the lower accidentals are shown to be related diatonically; the *C*♯ is pushed up from *C*, whereas a *D*♭ is lipped down from *D*. Notes above *f* are marked 'pinch't' and might indicate the reed or the instrument was more at ease in the lower octaves than the tenor range. The chart was reprinted in 1733, and later as *Apollo's Cabinet* in 1756.

Notation: B♭, C♯, D♭, F♯, G♯, A♭ and Sol/Fa
Compass: *B*♭′ – *g*′

B′	pinched B♭	*f*♯	123456F
C♯	pinched C	*c*♯	124A♭
D♭	slackened D	*f*′	2
E♭	123456FEB♭	*f*♯′	open
f	2	*g*′	23

7. *The Modern Musick-Master*, by Peter (Pierre) Prelleur (fl. 1728–*c.*1755). London, 1731.[21]

Eric Halfpenny[22] has speculated that this chart was derived from an earlier French source. His first reason is the French spelling of *'basson'*. Another is that Prelleur, a harpsichordist of French extraction, probably did only the editing or etching (not the compiling of the chart) and therefore would have turned elsewhere for assistance or to an existing written source. The chart seems to have been tacked on to the end of the section on the oboe as an afterthought. Its style does not match that of the other charts in the book and in particular its format is more like that of earlier French woodwind fingering charts using dots on a numbered grid and slashed dots for trills, rather than the rectangles on a grid system commonly used in English sources.

Notation: Diatonic notes listed; accidentals taken from trill chart
Compass: *B*♭′–*g*′

C♯	123456FEDB♭	*g*	23456
D♯	123456FEC	*c*♯	124A♭
c♯	124A♭	*f*♯′	234
f♯	23456FBCD	*g*′	23F

8. *Musicus Autodidaktos*, by Johann P. Eisel. Erfurt, 1738.

Eisel was born in Leipzig and for this reason one might assume he knew of the instruments of Poerschmann, Sattler, and the Eichentopfs, all of whom were key Leipzig bassoon makers during the time Bach lived there. This four-keyed bassoon chart is accompanied by a chart for a two-keyed fagotte (see above). Eisel's failure to mention the three-keyed bassoon implies its extinction by this time. The text mentions that the 'German Bassons, Fagotte, or Bombardi' (all terms for the dulcian) were no longer in use after the introduction of the 'Musique' of the 'French' or 'Italian' mode.[23] This indirectly implies that the bassoon, which brought about the extinction of the dulcian, was of French origin, a situation which parallels that mentioned by Talbot concerning the newly introduced French bassoon and the indigenous English fagott. Such a distinction attested by a source close to Nürnberg makes a strong case that J. C. Denner was making bassoons of French design.[24] (W 71.)

Notation:	B, Cis, Dis, Fis, Gis		
Compass:	*A′/B♭′–g′*		
C♯	not listed	*f*	2
D♯	not listed	*f♯*	open

9. *Musicalische Elementer*, by Johann Daniel Berlin. Trondheim, 1744.

The instrument pictured is of the ornately turned type typical of Haka, Rijkel, the Denners, or anonymous contemporaries (see Fig. 3). Note the high position A♭ key.

Notation:	B, Cis, Dis, Fis, Gis
Compass:	*B♭′–g′*
C♯	not listed
D♯	not listed
B♭	12346A♭
d♯	1346
f	2
g	23456
d♯′	12456
	13
e′	1245
	1
f′	145
	2
f♯	23456F
g′	23456

FIG. 3.
Berlin, source 9.

10. *Encyclopédie*, Diderot and d'Alembert. Paris, 1751.[25]

Bruce Haynes has suggested that the oboe chart from Diderot paraphrases Hotteterre, perhaps this is also the case for the bassoon.[26] Unfortunately, there are no earlier French sources for the bassoon to turn to for comparison. This chart records the introduction of high *a*; an advancement of technique in keeping with the type of instrument needed to play the difficult orchestral part-writing of Rameau. The instrument illustrated in Fig. 1 shows many details which become typically French stylistic features through the course of the century and can be assumed to be characteristic of the important mid-century Parisian makers: Charles Bizey (who may have taught Prudent), Thomas Lot, and (Jacques?) (de?) Lusse. The key work bears strong resemblance to bassoons by Bizey, Prudent, Porthaux, and other less known French builders. The wing has the graceful streamlining of these instruments, a style which continues through Ozi's instrument by Bühner & Keller, and on through Savary's bassoons of the mid-nineteenth century. The bell is similar to those made by Dondeine or Bizey, later refined by Prudent and Savary. French bassoons usually have some sort of knob-like ring on the upper bell, which is often crowned with a series of receding turned steps. One may see the progressive development of this feature over the century through the illustrations of Diderot, La Borde, and Ozi (see below). Diderot's original illustration also includes enlarged views of the following: an elongation of the brass band at the top of the wing, springs set under the key saddles, overly wide key pads, and a tapered butt joint. The A♭ key is in the high position.

Notation: B♭, C♯, E♭, F♯, G♯
Compass: *A′–a′*

A′	slacken *B*♭	*f♯′*	2345F
B′	pinched B♭	*g′*	123
g′	23456	*g♯′*	123B♭
c♯′	124A♭	*a′*	12B♭

11. *Apollo's Cabinet*, published by John Sadler. Liverpool, 1756.[27]

See *Musica Bellicosa* above (no. 6). The spelling 'Basson' is in the title. The chart differs in only one fingering: *c♯′* 124. (W88.)

12. *Tablature pour le Basson* (anonymous manuscript from the Citadel). Montreal, *c.* 1759.

This chart seems to have been hand-copied from Diderot. It is a French source that was found in the archives of the arsenal in Montreal, therefore probably pre-dates the rule of Canada by the English.[28]

Differs from Diderot in two fingerings.

C♯	123456FEDC (the half-holing of C is unclear, a slip of the pen or pinched?)
g′	23

13. *New and Compleat Instructions*, published by Longman & Lukey. London, 1770.

This work has the first illustration of a bassoon on any English chart and one can see several identifiable English characteristics on it (see Fig. 4). Late eighteenth-century English instruments are generally thicker in body and bulkier overall than their continental counterparts: all characteristics belonging to earlier period bassoons. In keeping with this antiquated chunkiness the crook and the wing pictured are thick (implying a wide internal calibre) and the butt is untapered and squarish. The bell is a refined echo of the earlier eighteenth century double-waisted 'English' bell by Stanesby (Stanesby's bell might be the stylistic echo of an earlier 'French' model).[29] The sharp-angled, wedge-shaped wing is an uniquely 'English' feature which lasted well into the nineteenth century. If one were to line up in chronological order the instruments of the Stanesbys, Blockley, Cahusac Sr, and the Newark Milhouses, this instrument matches nicely the features of the next generation: Proser, Kusder, Cahusac Jr, and the London Milhouses. As dealers, L & L did stamp their names on bassoons (one of which survives in the Luton Museum); however, it is unlikely they actually manufactured the instruments they sold. The A♭ key is in the high position. (W 120.)

Notation: B♭, C♯, D♯/E♭, F♯, G♯/A♭
Compass: *B♭′–g′*

C♯	not listed
E♭	123456FECB♭
c♯	124A♭
f	A♭
f♯	23456FDCB♭
	456FE
g	23456A♭E (error?)
g♯/a♭	23456A♭
c♯′	124A♭
d♯/e♭′	12456
f′	6
	456
f♯′	234A♭
g′	23A♭

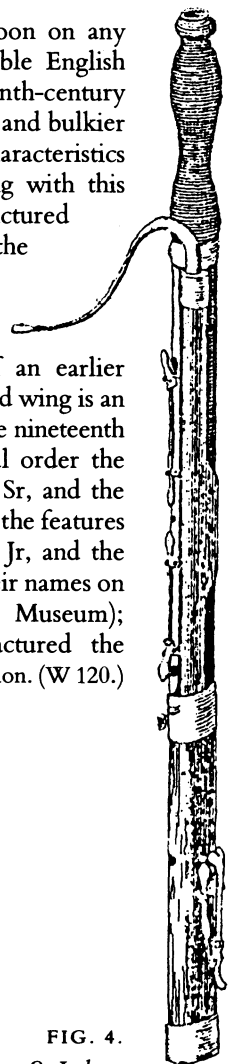

FIG. 4.
Longman & Lukey, source 13.

14. Anonymous Dutch (Holland, unknown dating).

This is an interesting chart because it seems to borrow from a mixture of sources. The text is written in Dutch but uses the word 'basson', suggesting that it might be of Flemish origin. The illustration is too close not to be a caricature of Longman & Lukey's illustration (see Fig. 5), yet, though it shares a majority of fingerings with Longman & Lukey, it is also sufficiently different to suggest it has been adapted, corrected, or updated to another instrument or by another bassoonist.

Exceptions to Longman & Lukey:

g	23456
e'	1
	1245
f'	6
	2456
f♯'	23456F
g'	234F

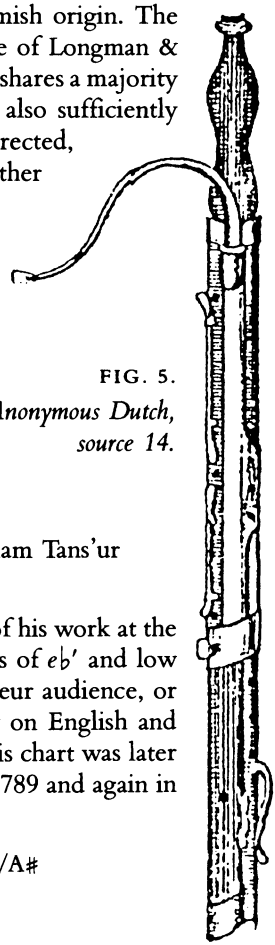

FIG. 5. *Anonymous Dutch, source 14.*

15. *The Elements of Music Display'd*, by William Tans'ur (1700–1783). London, 1772.

Tans'ur was a psalmist who directed most of his work at the lucrative American church market. Deletions of *e♭'* and low *F♯* suggests that he was writing for an amateur audience, or alternatively that the *F♯* was untrustworthy on English and American instruments and better left out. This chart was later reprinted in Tans'ur's *A Musical Grammar* of 1789 and again in 1829. (W 113.)

Notation: C♯/D♭, E♭/D♯, F♯/G♭, G♯/A♭, B♭/A♯
Compass: *B'–g'*

f♯'	234F
g'	23F

16. *Instrumental-Runsten*, by Lorents Nicolaj Berg. Kristiansand, 1782.

This Norwegian source appears in the style of print and format to be from a much older source. The chart itself is quite vague as to whether it is for bassoon or dulcian. On one hand, it displays a *'Tabellen til Dulcianan'* which includes keys to control G♯ and *F* with the right little finger; whereas only the *F* is normal for the dulcian. On the other hand,

it is vague about how many and which keys are controlled by the thumb. The range is *B*♭′ (lipped from *C*) to *g*′, omitting low *E*♭.

Notation:	B, Cis, Dis, Fis, Gis
Compass:	*B*♭′–*g*′
D	123456FE
f	2
f♯′	23456F

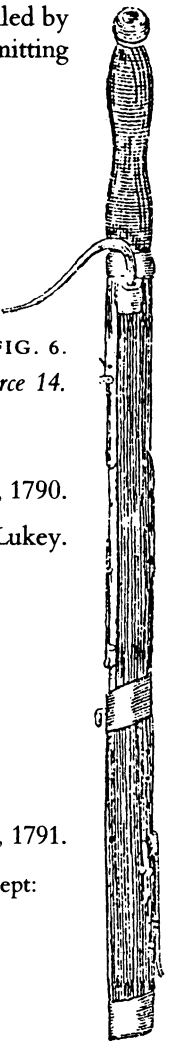

FIG. 6.
Preston, source 14.

17. *Complete Instructions*, published by Preston. London, 1790.

This is probably based on the chart of Longman & Lukey. (W 166.)

f♯	23456F
	456FE (shared alternate)
g	23456
f′	6
	12456F (Preston addition)
	456

18. *Royal Encyclopaedia*, published by C. Cooke. London, 1791.

This chart shares all fingerings with Longman & Lukey except:

e♭	13A♭

19. *Muzijkaal Kunst-Woordenboek*, by J. V. Reynvaan. Amsterdam, 1795.

Reynvaan published charts for two, four, and six-keyed bassoons in this source. At first glance the illustration seems so distorted, and some of the fingerings so extreme, that one is inclined to dismiss the entire chart (see Fig. 7). On closer inspection one realizes it is the most exhaustive, widest ranging four-keyed chart that exists. The same illustration is used on all three charts, thus is probably not meant to be representational. The four and six-key charts are more distinct from each other than are Ozi's for six and seven keys. Notice the *c*″ on a four-key bassoon.

Notation:	All enharmonics listed
Compass:	*B*♭′–*c*″
B′	Pinched B♭
D♯/*E*♭	123456FCB♭
e♯/*f*	open
	2
f♯/*g*♭	23456F
	open
a♯/*b*♭	12346
	12346A♭
c♯′	124
	12346 (probable 124D or 1246)
d♯/*e*♭′	13
	12456
f′	open
	2
f♯′	23456F
	2456F
g′	234A♭
	234FA♭
g♯′	235A♭D
	235A♭FD
a′	12DA♭
b♭′	123456FA♭D
b′	2345FA♭D
c″	A♭

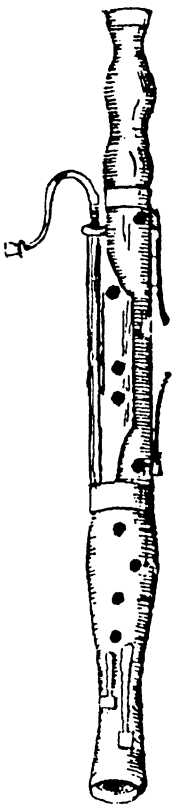

FIG. 7.
Reynvaan, source 19.

20. Incomplete manuscript by Dr J. W. Callcott. London, 1797–1802.[30]

This chart is a fragment from a collection of materials for an unfinished music dictionary. Evidently Callcott was aware of the use of wing keys. Written on the side of the page is: 'Two other additional keys are sometimes made in the upper part of the instrument to facilitate the performance of some of the more difficult notes'. The chart is complete to *g*′, but was intended to reach *c*″. It is identical to the patterns for the Longman & Lukey chart except for the following fingerings:

E♭	123456FECB♭
g	23456A♭E

21. *Lehrbuch der theoretisch Musik*, by Johann Joseph Klein. Leipzig, 1801.[31]

Notation: B♭, C♯, D♯, F♯, G♯
Compass: *B♭′–g♯′*

D♯	123456FEB♭
f♯′	234F
g′	23F
g♯	12F

22. *Complete Instructions*, by Joseph Gehot. London, 1820.

Earlier dates for this publication include 1784 and 1801. It differs from Longman & Lukey in only one respect. (W 259.)

d♯/e♭	13A♭

23. *Historisch-Technische der musicalischen Instrumente*, by Wilhelm Schneider. Leipzig, 1834.

This chart is a reprint of Klein.

FIVE-KEY

24. *Méthode pour apprendre à jouer en peu de la flûte*, by Jacques M. Hotteterre. Paris: Bailleux, *c.*1765.

One must wonder why Hotteterre did not publish a bassoon chart to accompany his early eighteenth-century methods for the other woodwinds. This is most curious in light of what we know about his relatives who played – and built – bassoons.[32] The Bailleux edition of 1765 is the earliest five-keyed fingering chart. Though the illustration does not seem to be as proportionately representative as Diderot (see Fig. 8) it does contain the same basic features, with the exception of the French position for the recently added E♭ key. One odd feature that could be of significance is the exaggerated bulge in the butt joint around the area of the finger holes. Some late eighteenth-century bassoons – especially by Porthaux – had very narrow butt joints, creating a problem for the length of holes 4, 5, and 6. One solution was to thicken disproportionately this area of the butt in order to add space for the hole length. (W 42.)

Notation:	B♭, C♯, E♭, F♯, G♯	
Compass:	*B♭′–a′*	
E♭	123456FEDE♭	(becomes standard fingering for bassoons with five or more keys)
f′	23456A♭	
f♯	23456F	
g′	234	
g♯′	123	
a′	12D	

FIG. 8. *Hotteterre, source 24.*

25. *Principe de basson par Abrahame.* Paris: Frère, *c.*1775–1823.

Reprint of 1765 Hotteterre by Bailleux.

26. *Essai sur la musique ancienne et moderne*, by Jean-Benjamin de La Borde. Paris, 1780.

Pierre Cugnier, the author of the first detailed tutor on the bassoon,[33] was a player in the Paris Opéra orchestra during the periods of Rameau and Gluck. La Borde notes that he refused to play solos because he considered them to be detrimental to the technique and tone essential for orchestral work. A considerable body of text concerning technique, reeds, and performance practice accompanies an illustrated chart, as does an additional highly detailed illustration showing internal and external features of the bassoon (Fig. 9). From the illustration one can see that the interior plug at the base of the butt joint is curved to follow the bore contour, a refinement thought to have been developed by Simiot a generation later. The text is important because it is likely to be the first codification of an oral tradition for bassoon technique developed by journeymen musicians from the time of the bassoon's invention in the mid-seventeenth century, and specifically because it is written from the point of view of an orchestral player with thirty years of performance experience in Paris. Cugnier mentions in the text that his instrument is fitted with a crook key; a feature uncommon until the second quarter of the nineteenth century.[34] This might have been the origin of the device pictured on the instrument of the German bassoonist Felix Rheiner,[35] who was twice soloist at the Concert Spirituel while Cugnier was still

active. The range of this chart is exceptional, culminating in high *f″* — well above the highest note in the bassoon solo from Stravinsky's *Rite of Spring*. (W 148.)

Notation:	B♭, C♯, E♭, F♯, G♯
Compass:	*B♭′–e″*
B′	slackened B♭
B	124 (error)
c	12 (error)
c♯	1234 (error)
e♭	(error)
e	13 (error)
f	3
g	23456
b	124 (error)
c′	12 (error)
c♯′	1234A♭ (error 124A♭)
e♭′	1 (error)
e′	13 (error)
f′	2345
f♯′	23456
g′	2A♭
g♯′	123D
a′	12D
b♭′	123456FA♭D
b′	1245FA♭D
c″	1245FEDC
c♯″	124
d″	15
e♭″	open
e″	2(3?)45EDCB♭
f″	24

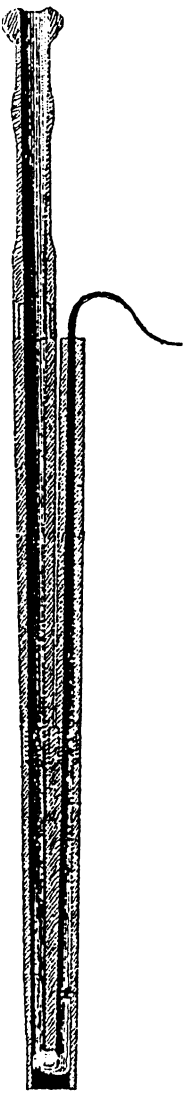

FIG. 9.
La Borde, source 26.

27. *Méthode nouvelle et raisonnée pour le basson* by Étienne Ozi. Paris, 1787. (See nos. 38–41 and 47 below for seven- and ten-key charts.)

Étienne Ozi was the most accomplished and influential bassoonist of the eighteenth century: he performed as soloist at the Concert Spirituel on thirty-seven separate occasions (nineteen of these playing his own compositions);[36] was the first bassoon professor at the Paris Conservatoire; published the first all-encompassing bassoon tutor; and had a considerable hand in designing bassoons. In his tutor of 1787 (see also chart 38) he includes two separate fingering charts for a six-keyed *'ancien'* and seven-keyed *'moderne'* bassoon. The earlier style of instrument is made by the important Parisian builders, Bizey and Prudent, while the new model is by 'Mr. Keller' of the Strasbourg firm of Bühner & Keller (Bühner having recently moved from Saxony).[37] The Strasbourg instruments he considered superior because of the enlarged bores of the bassoon and crook, which he thought to be responsible for a greater volume of sound, and also the A♭/G♯ key positioned below the F key head, which improved those notes, high *f′*, and high *a′*. Ozi had a right-hand thumb key added to raise low-centred *A*♭/G♯s and to help on the highest *b*♭*′*. In distinguishing between the bassoons of the past and the present Ozi is marking an important turning point in the history of the instrument: by the establishment of the equal-tempered G♯/*A*♭; by confirming the eventual geographical shift away from Paris as the leading centre of bassoon development to Strasbourg, and then to Germany; and by choosing a new type of instrument which incorporates the traditional German characteristics of evenness and a strengthened low register with the French qualities of expressiveness and an improved tenor register. Of the next generation of Parisian builders Ozi mentions that he owned several instruments by Porthaux, one of which was Ozi's own design.[38]

Ozi's illustrations (see Figs. 10 and 13) are highly detailed, showing interior/exterior, front/back views of six and seven-keyed instruments, though the only real representational difference between the two models is the right thumb key and the G♯/A♭ position. Note especially the changed G♯/A♭ position on the bore in the cross-sectioned illustration. The illustration marks the first documentation of the single-sided touch F-key and the wing key. Another feature mentioned by Ozi is the D key head guard. The exterior of the illustration bassoon corresponds almost exactly to that of a six-keyed bassoon by Prudent,[39] or to any number of surviving instruments by Porthaux. One glaring contradiction is the lack of the 'Strasbourg' type bell of Bühner & Keller

(also typical of Lindemann and other Strasbourg makers) on the illustration: a style which can be traced through to the bell of the modern French bassoon. (W 160.)

Notation: B♭, C♯/D♭, D♯/E♭, F♯/G♭, A♯/B♭

Compass: *B♭′–d″*

B′	pinched B♭′
C♯	123456FED(½C)
c♯	124A♭
g	23456
g♯	123456A♭
c♯′	124A♭
d♯′	13
e♭′	12456
f′	2456A♭
f♯′	2345F
g′	234
g♯′	23D
a′	12D
b♭′	123456FDW
b′	1245FW
c′	124FEDW
C♯′	1W
d′	W

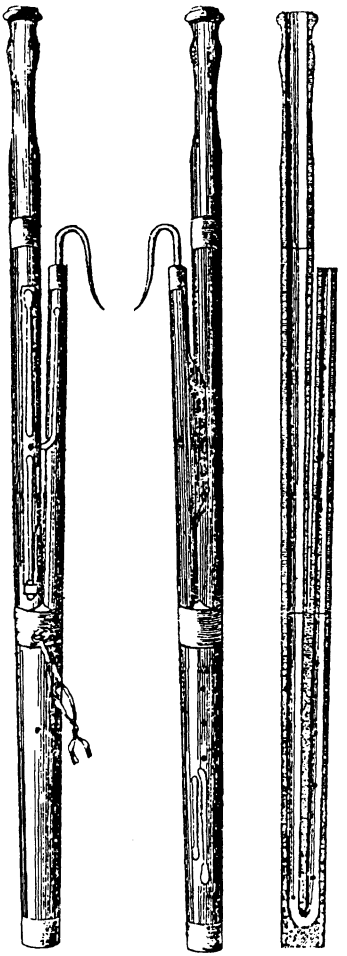

FIG. 10. *Ozi (Ancient), source 27.*

28. J. V. Reynvaan (see no. 3 above). Amsterdam, 1795.

Notation: All enharmonics listed

Compass: *A′–c″*

A′	slackened *B♭′*	*f′*	open W
B′	123456FEDE♭CB♭	*f♯′*	2456F
C	123456FEDE♭C (probable error)	*g′*	234A♭E♭W
C♯/D♭	123456FEDC (probable error)	*g♯′*	235A♭DE♭
D	123456FEE♭D (probable error)	*a′*	12DA♭W
D♯/E♭	123456FE♭CB♭ (probable error)	*b♭′*	123456FG♯DE♭W
g♯	123456 (probable error)	*b′*	1245A♭FDE♭W
e♭′	13W	*c″*	E♭A♭W
e′	1W		

29. *Tablature pour le basson*, source: Eichstätt Ord. Archives no. 483. France?, unknown date.

This chart appears to be of French origin. Its illustration (Fig. 11) is notable for a high position A♭, a French looking wing, a French position for the E♭, and a bell shape that vaguely resembles those of Bühner & Keller. Please note the acoustical distinction made between *A*♯ and *B*♭. Many modern players are in agreement that these fingerings do produce pure-third *A*♯ and *B*♭ pitches. This relationship seems most often to be characteristic of surviving eighteenth-century French instruments.

Notation: B♭, C♯, E♭, F♯, G♯, A♯
Compass: *B*♭′–*c*″

C♯	123456FED
A♯	12345A♭
B♭	12346
g♯	12345A♭ (error)
a♯	12345A♭
b♭	12346
f♯′	245A♭
g′	234F
a♭′	23F
a′	12D
b♭′	12456FDW
b′	1245FDW
c″	124FEDW

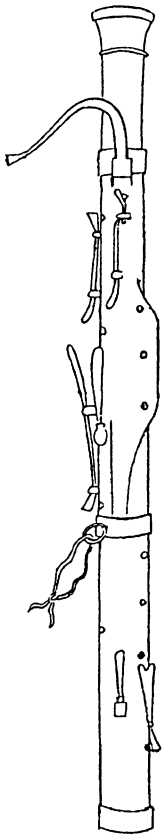

FIG. 11. *Eichstätt, source 29.*

30. *The Instrumental Assistant*, by Samuel Holyoke. Exeter, New Hampshire, 1807.
31. *The Instrumental Preceptor*, by Joseph Herrick. Exeter, N.H., 1807.
32. *For The Bassoon or Fagatto*, by O. Shaw. Dedham, Mass., 1807.

These charts carry no illustrations, thus making it difficult to know if they were for instruments by 'new world' makers (Catlin, Miner, Bacon, Bliss, or Meacham)[40] or for English instruments brought over to the United States from Europe. (W 289, W 288, and W 291.)

Notation: A♯/B♭, C♯, D♯/E♭, F♯, G♯/A♭
Compass: *B*♭′–*g*♯′

F♯	123456FRt	*f*♯′	456FE
c♯	124FE	*g*′	23A♭
g	23456	*g*♯′	234FE
e♭′	12456		

33. By George Wenzel Ritter (1748–1808). Berlin: R. Werchmeister, 1806–09.[41]

Ritter was one of the most prominent German bassoonists of the late eighteenth century. He was a bassoonist for the famous Mannheim orchestra (1764–78), later for the Königliche Capelle (1788–) in Berlin, and soloist at the Concert Spirituel (1778) on six occasions. The bassoon part for Mozart's *Sinfonia Concertante* was specifically written for him.[42]

The illustration on this chart shows some striking key patterns. All but the wing key are spade shape; the wing key head is square and appears to be of a narrower style added later. The key shafts are markedly pinched at the saddle points, perhaps suggesting unseen wooden mounts. The E♭ position is German. The F touch has a long, narrow swallowtail (see Fig. 12).

Notation: B♭, C♯, D♯/E♭, F♯, G♯
Compass: *B♭′–e″*

D♯	123456FEE♭ (possible error: lacks D)
E♭	123456FEB♭ (possible error: lacks D)
f	2A♭
f♯	23456FDCB♭
g	23456
c♯′	124A♭
d♯′	13
e♭′	12456
e′	1
	12346E♭D
f′	6
	2456A♭
f♯′	234F
g′	23F
a♭′	12356DE
a′	12DW
	12356E
b♭′	123456FDW
b′	1245FDW
c″	145FDW
c♯″	145FEDW
d″	FDW
e″	DW

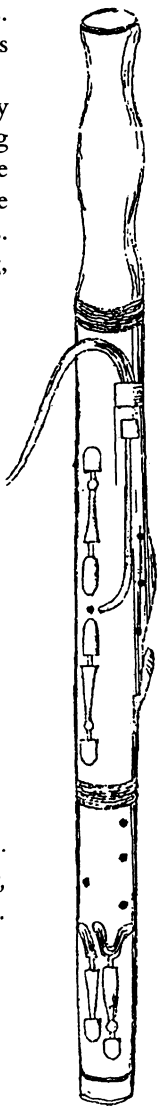

FIG. 12. *Ritter, source 33.*

34. *The Instrumental Preceptor*, by William Whitely. Utica, NY, 1816.

See Holyoke above. Identical. (W 351.)

35. *Scala für den Fagott*, by Böhm. Berlin, 1817.[43]

See Ritter above. Identical.

36. *The Instrumental Director*, by Ezekiel Goodale. Hallowell, Maine, 1819.

See Holyoke above. Identical. (W 365.)

37. C. S. Schwarz (Kirst). 1823.

These fingering patterns, suggested by a bassoonist for use on a F. G. A. Kirst bassoon, are taken from a nineteenth-century letter.[44]

Compass:	*B♭′–d″*
B′	·add Rt
g′	234F
g♯	123456D
	12346D
a′	1DW
	12DW
	2DW
a♯′	123456FCW
b′	1245FDE♭W
c″	14FDE♭W
	1FDE♭W
c♯″	14FEDE♭W
	1FEDE♭W
d″	DE♭W

SEVEN-KEY

38. *Méthode nouvelle et raisonnée pour le basson*, by É. Ozi (see *'Moderne'*, Fig. 4 *(b)*). Paris, 1787.

See six-key chart by Ozi above for descriptive details. The seven-key chart includes the fingerings for the righthand thumb key. An annotated edition of Ozi's *'Moderne'* chart was published in Germany by B. Schott circa 1797. (W 160.)

B′	pinched *B*♭′
C♯	123456FED, ½C
A♯/*B*♭	12346D
c♯	124A♭
g	23456
g♯	23456A♭
c♯′	124A♭
d♯′	13
e♭′	12456
e′	1
	1456
f′	2456A♭
f♯	2345F
g′	234
g♯′	23D
a′	2356A♭DE♭
	23W
a♯/*b*♭′	123456FRtDW
b′	1245FRtW
c″	124FEDW
c♯/*d*♭″	1W
d″	W

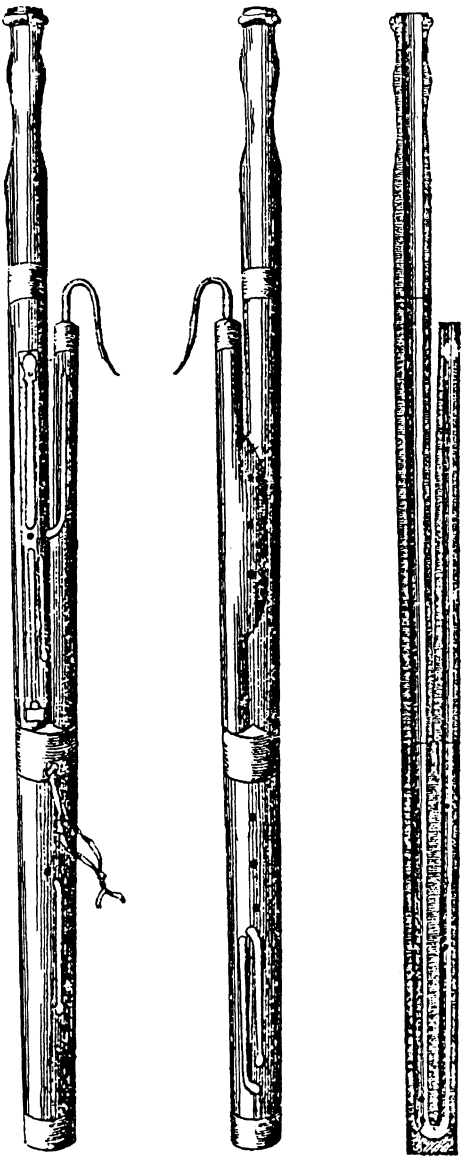

FIG. 13. *Ozi (Modern), source 38.*

39. *Nouvelle méthode de basson*, by É. Ozi. Paris, 1803. Reprinted as *Nouvelle édition de la méthode de basson par Ozi.* Paris & Bruxelles: Henry Lemoine & Co.[45]

This is a revised edition in which Ozi makes a few changes in the seven-key chart and also adds some corrective fingerings in the text. (W 271.)

F♯	123456EB♭ (corrects hesitation)
G♯	123456A♭E♭B♭ (to raise)
B♭	12346EB♭ (to clarify)
e	16 (to mute or raise)
g♯	23456A♭D (to centre)
e′	1
	1456
	13456A♭
f♯*′*	2345FB♭ (to mute)
g′	234B♭ (to mute)
a♭*′*	235D
a′	2356A♭DE♭

40. *Nouvelle méthode de basson*, É. Ozi. Leipzig: Offenbach, 1805.

This unaltered version of 1803 edition has text in German and French.

41. *Neue Fagot Schule von Ozi.* Leipzig: Breitkopf & Härtel, 1807.

This version of the 1803 chart is annotated only in German.

42. *New System for Instruments and Voice*, by Auguste Bertini. London: Longman & Co., 1830.

Chart only.

Notation: All enharmonics including double flats and sharps
Compass: *A*♯*′*–*d″*

B′	lipped down from C
C♯	lipped down from D
B♭	12346D
c♯	124A♭
g	23456
g♯	23456A♭

c♯	124A♭
f′	2456A♭
f♯′	2345F
g′	234
g♯′	23D
a′	23W
b♭′	123456FRtDW
b′	1245FRtW
c″	124FEDW
c♯″	1W
d″	W

EIGHT-KEY

43. *The Cyclopaedia*, by Abraham Rees. London: Longman, Hurst, Rees, and Orme, 1807.[46]

The illustration (Fig. 14) on this chart is almost as sharp as a photograph. A single-band reed of the type made by Thomas Ling is clearly visible, as is the long-flared bell typical of nineteenth-century London makers, Gerock, Goulding, Key, and Astor.

Notation: B♭, C♯, E♭, F♯, A♭
Compass: *B*♭′–*b*♭′

C♯	none listed
E	123456FEE♭
F♯	123456FRt
A♭	123456A♭Rt
B♭	12346A♭Rt
B	1234A♭
c♯	124A♭
e♭	12456
a♭	123456A♭DC
b	1234A♭
c♯′	124A♭
e♭′	12456
f′	23456E
f♯′	234A♭E
g′	23A♭E
a♭′	123A♭W
a′	123W2
b♭′	123456FW2

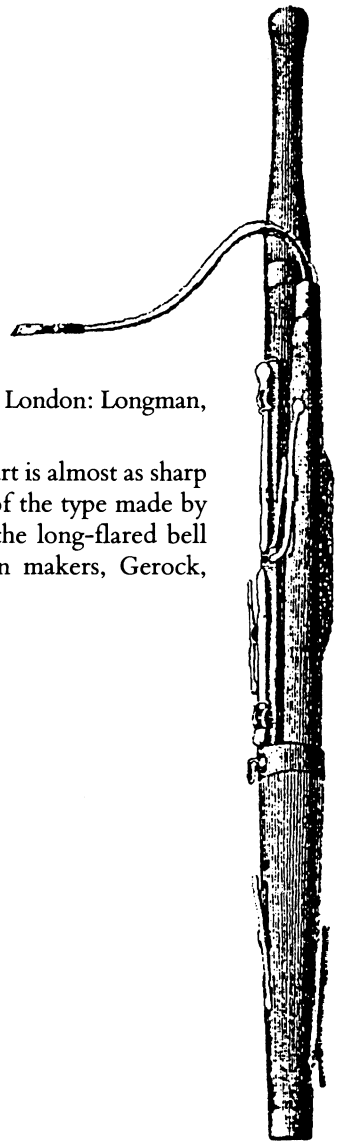

FIG. 14. *Rees, source 43.*

44. *Vollständige theoretisch-pracktische Musikschule*, by Joseph Fröhlich. Bonn, 1811.

Joseph Fröhlich's tutor was the first major German source for the bassoon. It is clearly indebted to Ozi for much of its form and content. The chart is titled *Scala für einen Dresd'ner Fagott mit der hohen A und C Klappe*.[47] However, the instrument does not really resemble any existing Dresden bassoons by makers such as Grundmann, the Grensers, Floth, or Wiesner (see Fig. 15). The illustration seems to have been patterned after Ozi's illustrations with two Dresden features etched in the plate: the German E♭ and a tuning hole in the bell. The text that accompanies is an exhaustive treatment of all the technical problems encountered in playing the bassoon. This includes a section on his own corrective fingerings, as well as the inclusion of those suggested by Ozi. In comparing the fingerings of Fröhlich's chart to those given by Ozi (ten and twenty years prior) for the upper range of the instrument it would appear that the French instruments played with more ease in that range than did the Dresden models. This, taken with the chart for a French ten-keyed instrument published the same year as Frohlich's tutor, would imply that Germany had not yet overtaken France as the leading centre of bassoon development. (W 310.)

Notation:	B♭, C♯, D♯, F♯, G♯, A♯
Compass:	*B♭′–b′*
B′	pinched *B♭′*
C♯	123456FED(½C)
E♭	123456ECB♭ (if without E♭ key)
F♯	123456FRt
	123456E (add B♭) (Ozi)
B♭	12346
	12346RtB♭ (usually too sharp, must adjust with embouchure)
	12346EB♭ (Ozi)
B	1234
	12356A♭ (brighter, if too sharp adjust down)
c	123
	123F (to lower)
	123A♭ (to lower)
c♯	124
	124A♭ (for stability in sustaining)
d	12
	12A♭ (for tone security)
e♭	13
	13A♭ (for tone security)

e	1
	1A♭ (for tone security)
	16 (Ozi)
f	open
	3 (to lower)
	456
	456F
f♯	123456FRt
g♯	123456A♭
	123456A♭D (Ozi)
a	12345
	12345FRt (to lower)
b	1234
	12356
c′	123
	123A♭
d′	12
	12A♭
e♭*′*	12456
	13
e′	1
	1A♭
	13456
	1456 (for soft attacks, Ozi)
	1456A♭ (to lower, Ozi)
f′	2456
	Open
	2
f♯*′*	2346F
	2345F
	2345FB♭ (improves articulation, Ozi)
g′	236F
	234
	234F
	234B♭ (improves articulation, Ozi)
g♭*′*	23D
	23A♭
	23
a′	123DW
	23D
	23A♭
	2356A♭DW
	23E♭

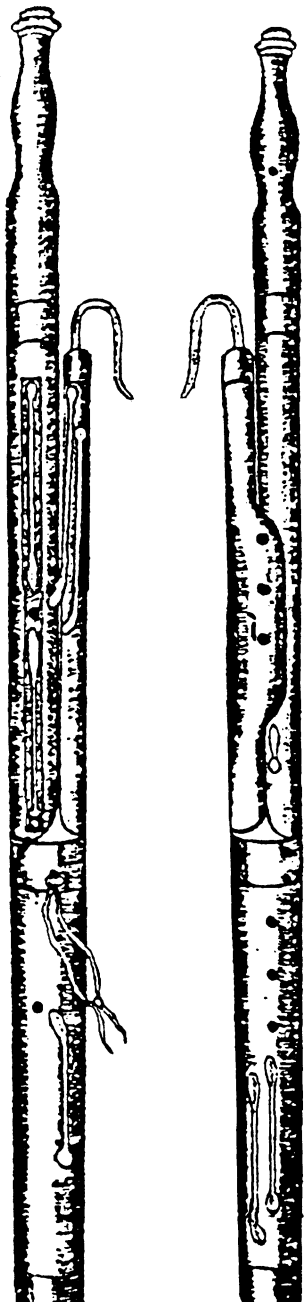

FIG. 15. *Frölich, source 44.*

b♭′	123456FA♭D
	123456FA♭DW (Ozi)
b′	12345FA♭D
	12345FRtW (Ozi)
c″	1245FECDW2
	124FEDW (Ozi)
c♯′	124EDCW2
	1W (Ozi)
d″	1W2
	W (Ozi)
d♯″	W2

45. *Neue Scala für den Fagott für Schülen zum Selbstunterricht*, published by Ignaz Sauer. Vienna, *c.* 1830.

This is the only chart from Vienna around Beethoven's period. The Viennese instruments from that time are distinctive in their elegance and characteristic sound. The illustration (Fig. 16) has characteristics of some Central European bassoons. The instrument pictured is very similar to surviving bassoons by the Bohemian maker, I. Huittl. The E♭ is in the French position and all the keys appear to be mounted on wooden blocks.

Notation:	A♯/B♭, C♯/D♭, D♯/E♭, F♯/G♭, G♯/A♭
Compass:	*B♭′–b♭′*
C♯	none listed
F♯/G♭	123456FRt
f♯/g♭	23456F
	23456FRt
d♯/e♭′	12456
	13
f′	2456
	2
f♯′	23456F
g′	234F
	2346F
g♯/a♭′	23F
	236F
a′	23W
a♯/b♭′	23WW2

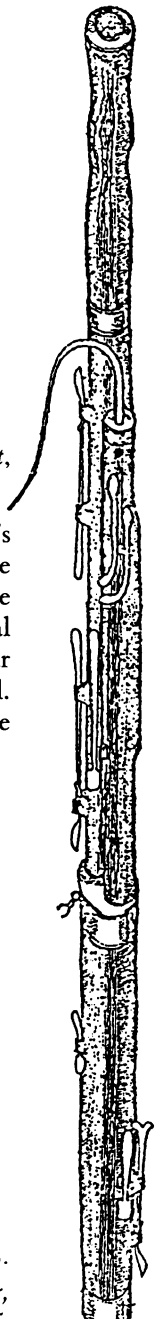

FIG. 16. *Sauer, source 45.*

46. *Compleat Instruction*,[48] by Ch. F. Eley. London, 1828.

Eley designates the first wing key as G♯/A♭ and the second wing key as B♭. (W 308.)

Notation: B♭, C♯, E♭, F♯, G♯
Compass: *B♭′–b♭′*

C♯	none listed
F♯	123456FRt
G	123456Rt
B♭	12346E
B	123456E
	1234
c♯	1346F
g	23456
c♯′	12356F
e♭′	12456
e′	1456
f′	2456A♭E
f♯′	2346A♭E
g′	23A♭E
g♯′	123W
a′	123W
	123W2
b♭′	123456FW2

TEN-KEY

47. *Petite méthode de basson*, by Ozi. Lyon: Heral, 1810. Reprinted as *Nouvelle édition de la méthode de basson par Ozi*. Paris: Dufaut et Dubois.[49]

These two editions for the ten-keyed bassoon are included for reference because of their direct relationship to Ozi's earlier work. The additional keys include a second wing key, a C♯ key operated by the left-hand little finger, and a B key between hole 5 and 6; all of which seem to be superimposed on an existing plate engraved for a seven-keyed instrument. (W 312.)

c♯	1234 (C♯ key)
B	12345 (B key)
a′	235E♭W2

NOTES

[1] Bassoons generally appear to have had much longer working lives than the other woodwinds, with a great number exhibiting signs of adaptation during a subsequent period; often to the point of ruin. Reasons for this were probably due to the fact that bassoons were more complicated and expensive to manufacture than the smaller instruments (therefore were not as easily replaced), and also because they adapted successfully to the ravalement process.

[2] Paul J. White, 'Early Bassoon Reeds: A Survey of Some Important Examples', *Journal of the American Musical Instrument Society* (hereafter *JAMIS*), X (1984), pp. 69–96.

[3] I owe great thanks to William Waterhouse for selflessly supplying photocopies of most of these fingering charts from a collection he had the foresight to begin many years ago. A more comprehensive documentation of primary sources will be included in my D.Phil thesis: 'The influence of reeds and fingering patterns on the evolution of the early bassoon', which is currently in progress. Thanks also to Al Rice, Eric Schwandt, and The Bate Collection of Historical Instruments, Oxford, for providing additional charts for this study. The preliminary transcription undertaken by Mr Waterhouse has proved especially helpful as a check against my own work in judging the thousands of dots making up the tablature. Lastly, I would like to thank Maurice Byrne, Jeremy Montagu, Phillip T. Young, William Waterhouse, and David Rycroft all of whom made useful suggestions on the improvement of this article. Anyone wishing to contribute newly discovered chart sources please feel free to contact me through Hertford College, Oxford.

[4] This may explain why it was not necessary for the bassoon to develop the split-hole system of the oboe.

[5] This conjecture is based solely on my own (admittedly subjective) experiences gained during the playing and tuning of reproductions of seventeenth and eighteenth-century bassoons.

[6] One of the (if not the) earliest known four-key instrument has recently surfaced in East Germany, built by the Amsterdam maker Richard Haka (1645–1745). A trade card by Haka's partner Rijkel displays a four-key instrument of very similar design from the year 1705: see frontispiece in Adam Carse, *Musical Wind Instruments* (London: Macmillan, 1939).

[7] French attribution is difficult to prove, as only a handful of original French wooden instruments survived the cold winters directly after the French Revolution. Yet, considering such evidence as the difficulty of French repertoire (Rameau's part-writing, Ozi's concertos — highest note *d″*, and Mr Dard's solo-sonatas in particular), the tradition of *Grands Hautbois*, the quality of the few French instruments that have survived, Pierre Cugnier's crook key, Ozi's right-hand thumb key, and the thorough, progressive nature of the tutors and fingering charts from the period, one could safely assume that the French bassoon makers were at the fore of all innovations during the eighteenth century.

[8] Although there are a few exceptions, generally English instruments from the late eighteenth and early nineteenth centuries share in common many of

the physical characteristics of early eighteenth-century bassoons, and look to be of a more primitive technology than their continental counterparts. These instruments sometimes added the right-hand thumb key to a conventional four- or five-keyed instrument before the attachment of a wing key. This is probably due to the technical needs of the differing musical uses to which these instruments were put. In England and America bassoons were often used to support congregational singing, where a solid, easily played *F*♯ would have been more important than the tessitura needed for solo and orchestral work.

[9] Richard Semmens, 'The bassoon in Marin Mersenne's *Harmonie universelle* (1636)', *JAMIS* X (1984), pp. 22–31. As this article was going to press, an intriguing piece of iconographical evidence concerning the proto-bassoon appeared in an article about the Dresden *Hofkapelle*. The drawing (after Pöppelmanns) documents the forty-ninth birthday celebrations for Augustus the Strong. On this there can be seen within the orchestra an instrument similar to a dulcian which has an extended B♭ bell (as was acoustically predicted under B♭ key heading above). The instrument is clearly not a conventional bassoon, nor does it appear to be an artist's distortion. A fuller appraisal is not possible at this point. See O. Landmann, 'The Dresden Hofkapelle during the lifetime of Johann Sebastian Bach'. *Early Music* XVII/1, (1989), p. 18.

[10] One has only to look to the solo sonatas of Böddecker, Selma y Salverde, and Bertoli for evidence of this.

[11] Dulcian players were noted for their virtuosity; particularly in having the fast fingers and tongues required for improvising diminutions. See Johann P. Eisel, *Musicus Autodidaktos* (Erfurt, 1738), p. 104. Unpublished translation by Christoph Höllger.

[12] William Waterhouse suggests that Vivaldi wrote his bassoon concertos for the dulcian; something not out of the question when considering that the high Renaissance chorton continued in Venice throughout the Baroque period. See, 'Bassoon', *The New Grove Dictionary of Music and Musicians* (London, 1980), p. 276; also Bruce Haynes, 'Johann Sebastian Bach's Pitch Standards: the Woodwind Perspective', *JAMIS* XI (1985), pp. 109–110; and B. Kenyon de Pascual, 'A Brief Survey of the Late Spanish Bajón', *GSJ* XXXIV (1984), pp. 72–79.

[13] Daniel Speer, *Grundrichtiger Unterricht der musikalischen Kunst oder vierfaches musikalisches Kleeblatt* (Leipzig: Edition Peters, 1974).

[14] For the convenience of those who wish to locate the original sources, I have cross-referenced each chart with the catalogue number given them by Thomas Warner in his book *An Annotated Guide to Woodwind Instruction Books, 1600–1830*, Detroit Studies in Music Bibliography, 11 (Detroit: Information Coordinators, Inc., 1967).

[15] See Eisel, op. cit., p. 104.

[16] The folio (11) watermark shows a post horn in a shield with a countermark HCR on a separate sheet. There were three English paper sources which are quite similar, dating from 1650 (2779), 1680 (2687), and 1683 (2686). A slightly different watermark (post horn with initials HC placed below the shield) is seen on La Riche's hautbois chart. One source from 1684 (2780) appears to be the

same, while another, dated 1690 (2693), is similar but for a reversed horn. My judgement is that the paper for the manuscript was produced between 1680 and 1690. See E. Heawood, 'Watermarks I', *Monumenta Chartæ Papyraceæ* (Hilversum, The Netherlands: The Paper Publications Society, 1950), Pl. 357. See also Maurice Byrne, 'Pierre Jaillard, Peter Bressan', *GSJ* XXXVI (1983), p. 5. And also see Robert Unwin, 'An English Writer on Music: James Talbot 1664–1708', *GSJ* XL (1987), pp. 53–73.

[17] Talbot MS (GB-Och MS 1187), Christ Church Library, Oxford.

[18] See Haynes, op. cit., note 12, section concerning French musicians and instruments in Germany, p. 63. It would appear that the bassoon might have reached England earlier than Germany. Purcell is known to have used the oboe (and presumably the bassoon) as early as 1681 in *Swifter, Isis, Swifter Flow*. The earliest English iconographical evidence to support this is the drawing of a three-keyed bassoon on the Randle Holme manuscript (*c.*1688). See Randle Holme MS, British Museum (MS Harl. 2034. f. 207b). A recent article on the evolution of the Dresden *Hofkapelle* demonstrates that the French double-reeds (six oboes and three bassoons) first appeared at the Dresden court around 1697, but were probably not in use before 1694 when the orchestra was still employing Renaissance winds (cornetti and a dulcian). This is significant not only because of the important status Dresden held as a musical centre, but also because it was among the earliest of the German courts to adopt French musical tastes and forces. See Landmann, note 9 above, p. 21.

[19] Joseph Friedrich Bernhard Caspar Majer, *Museum Musicum* (Kassel: Bärenreiter, 1954).

[20] Compare Denner's archaic heavily turned bassoon with the progressive form of the French bassoon seen together in a technical drawing with other more archaic looking woodwinds (*c.*1692) similar to those built in Paris during the late seventeenth century. See, Edward Croft-Murray, 'An Early 18th-Century French Drawing of Wind Instruments', *GSJ* XXXIII (1980), p. 145 (Pl. XXII). See also note 18 above.

[21] Peter Prelleur, *The Modern Musick-Master or the Universal Musician 1731* (Kassel: Bärenreiter, 1965).

[22] Eric Halfpenny, 'Peter Prelleur', *GSJ* XIX (1966), pp. 159–60.

[23] See Eisel, op. cit., p. 104.

[24] See note 18 above, p. 64.

[25] Fol. BS 459–486, Bodleian Library, Oxford.

[26] Bruce Haynes, 'Oboe Fingering Charts 1695–1816', *GSJ* XXXI (1978), pp. 68–93.

[27] My copy of this chart, from the National Library of Scotland, is dated 1756. Eric Halfpenny gives the date as 1754. Eric Halfpenny, 'The Earliest English Bassoon Tutor', *GSJ* XVII (1969), pp. 103–106.

[28] This unpublished chart was located and supplied by Eric Schwandt, University of Victoria, B.C., Canada.

[29] See Croft-Murray, op. cit., note 20.

[30] Callcott Manuscript: British Museum Add. MS 27680.

[31] This chart was supplied by Al Rice of Claremont, California.

[32] Research by Jane Bowers has found that Jean Hotteterre III inherited the position of *'basse de hautbois'* with *Grands Hautbois* from Jean Hotteterre IV, and that Nicholas Hotteterre III (the uncle of Pierre Chedèville, who was the father of another family of makers) was a bassoon builder. See Jane Bowers, 'The Hotteterre Family of Woodwind Instrument Makers', *Concerning the Flute*, ed. Rien de Reede (Amsterdam: Broedmans & van Poppel B. V., 1984), pp. 37–38.

[33] Jean-Benjamin de La Borde, *Essai sur la musique ancienne et moderne* (Paris, 1780), pp. 323–343.

[34] See Harold Eugene Griswold, 'Étienne Ozi (1754–1813), Bassoonist, Teacher, and Composer' (Ph.D. Diss., Peabody Institute of Johns Hopkins University, 1979), p. 277.

[35] See William Waterhouse, 'Bassoon', *The New Grove Dictionary of Music and Musicians*, p. 274.

[36] This compares with Devienne (8), Ritter (6), Rheiner (2), and Besozzi (3). See Griswold, op. cit., p. 68.

[37] See 'Bühner & Keller' under maker listing. Will Jansen, *The Bassoon, its History, Construction, Makers, Players, and Music* (Buren, The Netherlands: Frits Knuf, 1979), chapter 8: p. 345. One must approach Will Jansen's book with great care. It is obvious the man has uncovered a wealth of information, much of which cannot be trusted because of the lack of documentation and textual contradictions. Mr Jansen was gravely ill during the writing of this book and died soon after its publication. Unfortunately, the opportunity has been lost to strengthen and correct the weak points of this voluminous work of such great potential.

[38] This relationship continued for another twenty years. In a dispute with Savary about who actually invented the wooden crook, Porthaux claimed he was assisted by Ozi in the development of this device. See Griswold, p. 280, note 34.

[39] Now in the Musée d'Histoire de la Ville (Neuchatel, Switzerland).

[40] Robert E, Eliason, 'Oboes, Bassoons, and Bass Clarinets, made by Hartford, Connecticut Makers before 1815', *GSJ* XXX (1977), pp. 43–51.

[41] See G. W. Ritter, RISM R1756.

[42] See Griswold, pp. 66–7.

[43] Henk de Witt collection, Amsterdam.

[44] This chart transcription was found by William Waterhouse in a typewritten letter sent to Lyndesay G. Langwill by F. Marcus in the 1930s. The original nineteenth-century letter from which the transcription was taken, now believed to be in the Heckel archives in Biebrich, specified the chart as being for an instrument by F. G. A. Kirst. The letter to Langwill is contained in the Langwill archives currently under the stewardship of Mr Waterhouse.

[45] Griswold (p. 242) dates the Lemoine edition 1871–1879.

[46] British Museum Add. Ms. 12216.

[47] 'The fingering chart is prepared for Dresden bassoons, since they are so numerous here; nevertheless, fingerings of the *Parisian Bassoon Tutor* which differ from these are also given, especially for the high range.' See Marvin D. Degrade, 'A Translation and Study of Joseph Fröhlich's *Vollständige theoretisch-praktische Musikschule* (1810–11)', (D.M.A. diss., Indiana University, 1970), p. 24.

[48] Bate Collection of Historical Musical Instruments, Oxford.

[49] Griswold, p. 242, dates Dufaut at 1820–26.