A HISTORY OF THE PHYSICAL DEVELOPMENT OF THE BASSOON

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CHAPTER 1

INTRODUCTION

The purpose of this paper is to present a descriptive history of the physical development of the bassoon from its earliest appearance as a primitive conical twin-bored instrument in 1550 to the present date. Through an interest in the history of musical instruments and the added incentive of years of study on the bassoon, the author has undertaken this history.

With the opportunity to study the actual instruments available in museums in European collections, and to relate these instruments to written history, the author had at her disposal methods and materials not available to many students of the history of the bassoon in this country. It was with these thoughts in mind that portions of a European trip in the summer of 1970 were set aside for study.

The development treated in this paper begins with the first appearance of a conical, twin-bored double reed. No attempt will be made to trace the history of the double reed prior to the year 1550. Also no attempt will be made to relate the bassoon's developments to its use in the compositions of each period of history other than pertinent generalizations. No instruments will be considered other than the bassoon itself (i.e. contra-bassoon, tenoroon, etc.).

The author had at her disposal the library facilities at Sacramento State College and others in Sacramento, California as well as libraries in the San Francisco and Oakland areas. Libraries
connected with the museums in Europe were also used.

The collections studied were:

The Music History Museum, Copenhagen, Denmark

The Music History Museum, Stockholm, Sweden

The German National Museum, Nürnberg, Germany

The Instrumental Museum of the National Conservatory of Music, Paris, France

The Art History Museum, Vienna, Austria

In addition to these collections the Music History Museum Catalog of the Heckel family in Biebrich, Germany was used extensively. This catalog is of particular significance because it not only has accurate drawings of the instruments, it also contains extensive written physical descriptions of them. The descriptions include comparative analysis of key and pad development, fingering, measurements of the lengths of joints and also comments on the present physical condition of the instrument.

This book was first brought to the author's attention by Mrs. Mette Müller, curator of the Stockholm Music Instrument Museum. The book was not available to the author in this country—not even in the Library of Congress—and was purchased by the author for use in this study from the Heckel firm in Weisbaden, Germany.

Sections of books have been devoted to the history of the bassoon in the past, but it is only recently that an entire book was published on the subject. The book is entitled, The Bassoon and Contrabassoon and was written by Lyndesay Langwill. This book contained a main body of information for the author. However, many
details pertinent to a history of the instrument were omitted and research was needed to fill in the gaps.

It is assumed that the reader of this paper will have some background knowledge of music and particularly of the bassoon. However some clarification of terms and descriptive phrases should be given for the convenience of the reader.

1. The following standard method of indicating pitches is used:

\[
\begin{align*}
&\text{Bb' B' C - B c - b c' - b' c''} \\
&\text{\textbf{Bb' B' C - B c - b c' - b' c''}}
\end{align*}
\]

2. When referring to the parts of an instrument:
   a. top is the end nearest the reed, bottom the farthest from it.
   b. front is the side that is away from the performer and back is the side that is closest to him when playing.

3. L1 is the left forefinger, L2 is the left index, L3 is the left ring finger, L4 is the left little finger and L5 is the left thumb. Right fingers are noted similarly.

4. For the purposes of this paper the instrument holes have been named for the name of the note produced when closing it.

5. Open keys are those that stand open until depressed, and closed keys are those which are closed until they are depressed.

6. Closed keys are named for the note that they produce when they are opened. Open keys are named for the tone that they produce when they are closed.
7. The pieces of a bassoon are:
   a. reed (double beating cane)
   b. crook (curved tube onto which the reed is placed)
   c. wing joint (smallest wood part which has an overlapping piece of wood through which obliquely bored holes are placed that are covered by the first three fingers of the left hand)
   d. butt joint (a double bored piece within which the bore bends back upon itself)
   e. long joint (longest piece which fits onto the butt joint and lies parallel with the wing joint)
   f. bell

8. Ferrule is the metal band placed at the top or bottom of the joint for protective purposes.

The first chapter will be the consideration of the development of the bassoon from 1550 to 1650. This chapter will begin with the first references to this type of instrument. It will discuss the subsequent developments as described by Mersenne in his Harmonie Universelle and Pratorius in De Organographia and Theatrum Instrumentorum. Bass pommers will be discussed and their relationship to the emerging bassoon. At the close of this chapter and each subsequent chapter descriptions of instruments pertinent to the chapter will be given. These will have been either personally observed by the author, or described from the catalog of the music history museum of the Heckel family.

The second chapter will relate the development of the bassoon from a three-keyed, four-piece instrument to the addition of the
sixth key (1650-1800). Also included in this chapter will be a summary of an obscure manuscript by James Talbot, which has a good description of a bassoon of the period.

A discussion of the style of the instrument and the mechanisms used on them will be included. The final sections of the chapter will again be devoted to the descriptions of the instruments.

The Bassoon in France, the third chapter, describes the development of the bassoon in that country into a distinct style. This was of particular interest to the author, because this type of bassoon is not commonly used in this country.

The differences in the goals of the developments of the bassoon in France and Germany will be described. The developments of fingering system as it was developed in France will be discussed, with credits given to the specific developers of innovations whenever possible.

Experimental types of bassoon, including Boehm system instruments, were also developed, particularly in France. Discussion of these instruments will also be included in this chapter. Again, instruments will be described.

The last chapter will deal with the development of the bassoon in Germany. Particularly the developments of Almanraeder and the Heckel family. An article of particular interest will be reviewed that describes a recent study into the effects of the minute changes in the bore of the wing joint and the subsequent results of these changes.

The latest instruments of the German style in the collections will be considered, as well as the author's own bassoon.
CHAPTER 2

THE BASSOON FROM 1550-1650

The purpose of this chapter is to delineate the development of the bassoon from the first mention of it as a specific instrument until it became a somewhat more sophisticated, jointed instrument with three keys. This period of time is approximately 100 years or the period from 1550-1650. It is impossible to say with any accuracy when the doubled back conical-bored instrument first emerged. However, it is near 1550 when the first written records appear.

During this time it was known variously as the curtal, dulzian, fagot and bassoon, depending upon the country of origin and particular style of instrument. The name curtal came from the French courtaud, meaning shortened or squat, referring to its physical appearance. The name dulzian indicated a softness of tone, which was in contrast to the name curtal, which had previously been used to denote a type of short barreled cannon. The term fagot indicated the "bundle of sticks," the pieces of which it was sometimes composed, and the term bassoon indicated the general range of the instrument.

PHAGOTUM

It had been thought that the inventor of the bassoon was the Italian Canon, Afranio in the year 1539. This confusion had been heightened by Mersenne's comments in his Harmonie Universelle, when he made a statement in his Corollary relating to the Phagotum:
It must simply be noted that it is composed of two bassoons, the holes of which are closed by springs which are opened with the fingers, like those of which I have spoken in the explanation of the preceding instrument; and that two bellows are used or more often, two skins, one of which is fixed up to a bellow, like that of the musette or the sourdine, which is placed under the right, and the other is similar to the skin of the said musettes, which can be classed among the fagots. Now it is not necessary to search for the origin of this diction, which Theseus tries to have come from φάρω, inasmuch as the origin of the names which are given to instruments has not been very well noted, and one can say that it has been taken from our French diction fagot, because it contains two or more flutes, fixed or fagotted together, as is seen in the two preceding, which I have explained and given the figure of. 2

The differences that exist between the descriptions of Afranio's instrument and the early bassoon or curtal were too great for them to have been the same instrument. This idea was first disputed by Count L. Valdrighi who in 1893 published a fingering chart of 1565. 3 The subject was fully dealt with by Canon Galpin in The Proceedings of the Royal Musical Association in 1940-41, and in 1956 by W. A. Cocks of Ryton, County Durham, well known as a maker of bagpipes, who constructed an instrument and published his findings in the Galpin Society Journal. 4 This study was particularly important because no phagotum had survived in any known collection.

A physical description of the phagotum was given in Cocks' article and is important to the understanding of the differences of the two instruments, the phagotum and the curtal-fagot.

This instrument consists of two vertical side pillars, connected and held together by a supporting block between them which contains the airway conveying the wind supply from the bag to the reeds. Each pillar is divided at the middle point into two parts, the upper fitting tightly into the lower. The upper part contains three parallel bores, connected in series, and into these the sound holes open, the reed being inserted into the bottom end of the first bore.
The lower section of each pillar is hollowed out to serve as a wind chamber and also as a protection for the reed which is of beating pattern and made of metal. The bag and bellows are held in the usual manner of Northumbrian and Irish pipes, and the player is seated with the instrument resting on his thigh. The central pillar in front is purely ornamental and does not serve any useful purpose.³

Lynsey Langwill compiles the differences between these two instruments: "We may dispose of the fallacy by contrasting the features of the two instruments:

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<tr>
<td>Bellows-blown</td>
<td>Mouth-blown</td>
</tr>
<tr>
<td>Single Metal Reeds</td>
<td>Double Cane Reed</td>
</tr>
<tr>
<td>Twin U-tube 12.2in high</td>
<td>Single U-tube 4ft high</td>
</tr>
<tr>
<td>Cylindrical Bore</td>
<td>Conical Bore</td>
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Thus it seems that the only real resemblance between the two instruments was the similarity between their names (Phagotum and Fagot), unless the consideration is of the doubling back of the bore, and brass instruments had applied this principle prior to this date. One might note that while the term fagot is taken to mean "a bundle of sticks" it is not until much later in this instrument's development that it was divided into pieces.

EARLIEST REFERENCES

The earliest printed work that deals with musical instruments, Virdung's Musica Getutschr of 1511, does not depict any instrument of bassoon type, while it does indicate the existence of the "bombaròt" pomer, bass of the schalmey (schawm) family.⁷

There is some disagreement among historians as to the first reference to any bassoon-like instrument. Carse, in his book Musical Wind Instruments, indicates that the first Italian reference to
fagotto was in 1596 by Zacconi. Baines states that the first reference to this instrument was in 1540. Langwill, who has put the most individual effort into the study of the history of the bassoon says, "The earliest record of the word fagotto is in 1546 at Verona where on 9 Maggio furono commerati da Alvise soldato un Fagotto and un Dolzana." He seems to have found this reference rather recently, because he did not include it in his Article, "The Curtal," published in the Musical times in April of 1937.

In "The Curtal" Langwill gives reference to an inventory of the possessions of Henry VIII which includes,

...short instruments called Dulceuse. ... There is unfortunately no confirmation possible for the assumption that Dulceuse and Dolcian were synonymous, but the adjective short used in conjunction with a noun suggesting a subdued sweetness of tone justifies the inference the reference was being made to what was soon to be known as the Curtal.

Langwill curiously does not give further reference to this in his writings of any later date.

TIMBRE AND PHYSICAL DESCRIPTION

The curtal, as the bassoon was known in this stage of its development, was made of a single block of wood, either maple, pear, or boxwood. Baines' description in his book European and American Musical Instruments is:

... It is bored from the bottom upwards along one side, and from the top downwards, for the wider part of the conical windway, on the other side. The two bores are connected at the bottom by a cut-away chamber closed by a plug of wood (in later practice, cork). The wider bore ends with a short flare of variable form, and into the adjacent narrower bore is inserted a brass crook on which the double reed is placed. The six fingerholes lead
across to the narrower bore and the two thumbholes lead to the wider. There is an open key on the front for the little finger and on the back an open key for the lower thumb. The keys are usually encased in brass covers screwed to the wood.13

Baines neglects to say that there were two types of key work on these early instruments. The front always had six finger holes and an open key to be worked by the little finger of the right hand. However, the bottom two holes on the back varied from one instrument to the other. At times the lowest hole was covered with an open key. The key was depressed with the right thumb which also had the responsibility of covering the second hole. This was reversed on certain instruments, with the open key covering the second hole. The right thumb then covered the bottom hole and also depressed the changed key. The left thumb covered the uppermost hole on the back of the instrument.

The curtal was capable of overblowing to the octave register. This was especially important for this instrument. Although curtal consorts were built, the instrument proved more valuable as a bass to other instruments. Therefore, since no other sizes were common, the remaining bass curtal needed a great range.

Of the sound of these instruments Baines makes the comment, "As far as one can judge in their dry, leaking condition today the old curtals gave a warm, human sound, and would have spoken evenly and fluently when they were new."14

The characteristics of the curtal were naturally pronounced to the generation first observing them, viz., apparent shortness of tube owing to the U shape and a very noticeable softening of the tone due partly to the bending back of the sound column and partly to the smallness of the finger holes in proportion to the length of the tube.15
It seems, however, that the softness of the instrument was not sufficient. Attempts were made to further soften the tone of the curtal by means of perforated bell cap. The instrument was referred to as offen or gedact, depending upon the presence or absence of the cap.

PRAETORIUS - CHAPTER X

Michael Praetorius includes in his works, De Organographia (1619) and Theatrum Instrumentorum or Sciagraphia (1620)\textsuperscript{16} both written descriptions of the instruments of his time and scale drawings of them. The two chapters which are pertinent to this paper are the ones describing the shawms (pommers) and bombards, and the one dealing with fagots themselves. They are Chapter X and XI respectively.*

The shawm chapter is important to the study of the history of the bassoon because it indicates to us that these instruments were in use at the same time and were not direct predecessors to the bassoon, but rather its early contemporaries. The shawms were single-bored conical double reed instruments.

Praetorius first states that the shawms or bombards received their name from the word bombo or buzzing, because they "were blown with difficulty and with great pressure of breath and give out a fairly coarse sound."\textsuperscript{17}

There was, as was the custom at that time, an entire family or consort of these instruments. The lowest or gross bass pommer

* Note: Translations of Praetorius used in this paper will be from Langwill's, The Bassoon and Contrabassoon.
was referred to as the bombardone; a slightly smaller, or true bass, bombardo. The tenor was called the bassett and had four keys. There is included in this description an instrument called a nicolo, which was the same size as the bassett, but had only one key. This instrument has a capped double reed and for that reason should probably be included in the family of crumhorns. However, it was of similar physical style otherwise. Smaller still was the altpommer with one key, this was also referred to as the bombardo piccolo. The littlest was the only instrument called schalmey. "(Italian, piffero; Latin, gingrina, from the cackling so it would appear, like a goose, the characteristic of which is to cackle.)"18

In the written manuscript Praetorius does not refer to an even smaller instrument, discant schalmey, but does indicate that the instrument existed in his chart of instrument pitches.19 This gives a total of six different instruments in the consort of pommers.

"In pitch most of the schalmey's are about a tone higher than the cornetts and trombones (i.e. 'cammerton,' a tone higher than 'chorton')."20 This consort of instruments was primarily used in secular music while the cornetts and trombones were used in church music. Langwill indicates that when these instruments were used together either they would be transposed or a set of instruments would be used that were pitched in chorton. These were only the smaller members of the consort however, the larger ones must have had to transpose their parts.21

The instruments were ordinarily pitched a fifth apart. These were at first built to continue the ladder of fifths upward above
the treble and downwards below the bass, but when the instruments were all used together the fingering of these additional sizes got rather complicated, the descant having to play in too many flats and the great-bass in too many sharps. To overcome this difficulty the descant and great bass began to be supplied a fourth above and below the primary consort (i.e. alto, tenor and bass) instead of at the fifth.

Praetorius stated in his manuscript:

When, however, one wants to use a fifth instrument in the low or high ranges, then it is very troublesome to make them harmonize: the uppermost instrument is separated from the lowest by way of five fifths, i.e. being separated by a seventeenth, and that is very difficult to piece together. So nevertheless one is justified in advising an instrument-maker to work always with the correct treble and tenor pipes, and also with one about a tone lower, so that, accordingly, the latter may be sounded not a fifth, but only a fourth higher than the instrument immediately preceding.\(^{22}\)

Thus instruments were produced that were referred to as Quart (a fourth apart from the primary consort or a Quint (a fifth away).\(^{23}\)

In conclusion Praetorius adds that this consort was not in full use at that time. However, it is probable that the lower instruments were in more popular use than the upper.

BASS POMMERS

It is pertinent at this time to include reference to two articles by Otto Oromszegi concerning the gross bass pommer or bombard. In "The Bombards of Master 'W' of Rozmberk"\(^ {24}\) he describes the bassett pommer and the gross bass pommers of this collection. Of particular interest in the descriptions of these two instruments is the lower key mechanism. It is the forerunner of the later inter-
locking keys on the lower joints of the bassoon. There were two sets of swallow tailed keys placed slightly one on top of the other on the front and back of the instruments. This positioning allows the lowermost key to close the upper when in use, but allows the upper of the keys to work independently, similar to the C' and B' keys on the present French bassoon.

He refers to the great weight and awkwardness of these instruments (the gross bass measuring 321 cm. from the crook to the bell) as well as the buzzing tone of the instruments. "It could be argued whether such sounds were the current taste or whether makers and players could do no better," but no doubt the intonation and tone would have depended on the ear and technique of the player in the past just as it does today.

He also notes a flaw in the appearance of the gross bass because of a large knot which had broken out; "... It must have been difficult to find flawless pieces of maple in the large sizes required, a fact which also hindered the development of the double bassoon at the beginning of the seventeenth century."26

In his other article, "The Bass Bombard of 'Master CK' of Sopron," he makes some very relevant statements as to the use of this instrument and its subsequent demise.

The baroque orchestra did not admit the bombards, which disappeared from use by a process of, as it were, natural selection. While I was playing scales and simple tunes of the Sopron bombard, I recalled Domenic Scarlatti's crushing verdict on the wind instruments of his time, that he never even attempted to compose for them, even in the orchestra, on account of their defective intonation. His contemporary, Antonio Vivaldi, on the contrary included wind instruments, among them 3 and 4 keyed bassoons, in dozens of concertos. The lack of a sling and hang support, and the massive and
elementary mechanism, which is, moreover, very noisy, seems to rule out great technical facility upon the bass bombard. The wide spacing of the fingerholes, which are themselves rather large, so to speak, selected future players from the anatomical point of view. It has been suggested that, when in procession, the player was assisted by another person who carried the bell of the bass bombard on his shoulder. Apart from the problems of playing a bulky double reed on the march, the idea is impossible since the position of the reed on the traditional S-crook would place the player in an attitude where he would be unable to reach the fingerholes, or, indeed, to walk.28

Langwill published an article entitled, "A 17th Century Wood-wind Curiosity,"29 with an engraving of the earliest known performer of this instrument, Nikol Rosenkron of Nürnberg, a Lapplander who immigrated to Nürnberg and became well known for his artistry. The engraving is dated 1679, more than a century after the earliest references to the curtal, indicating that they had been in use simultaneously for at least that length of time. This is in direct opposition to Forsyth's statement that the bassoon is "historically a development of the bass pommer."30

Langwill also gives reference to a maker of instruments, Sigmund Schnitzer:

J. G. Doppelmayr in his 'Historische Nachruch von den Nürnbergischen Künstlern' records that Sigmund Schnitzer (d. 1575) celebrated wind-instrument maker in Nürnberg acquired a great reputation as a 'maker of d'Fagotte von außerordentlichen Grosse.' As a result, in nearly every musical text book Schnitzer is stated to have been the earliest noted bassoon-maker, but it would appear that if the instruments were remarkable by reason of their size, they could not have been bassoons, the characteristic of which was their compactness in contrast to the giant Pommers.31

Langwill makes the statement that gross-bass-pommers surviving in collections are exceedingly rare and indicates the presence of only four. Oromszegi lists ten in his first article and an additional two
in his second. It was most fortunate for the author to have seen and 
examined another example not listed in any of these in the Carl 
Claudius collection of instruments in Copenhagen, Denmark.

PRAETORIUS - CHAPTER XI

This chapter deals only with Fagotten-Dolcians and because 
of its importance should be included in its entirety.

Fagotten and dolcians (Italian, fagotto and dolcesuono) 
are so called indiscriminately, but some think that those 
which the English call single curtail (zingel korthol) are 
the genuine dolcians: and in depth of pitch as well as in 
tone they are like the bassett of the pommers, only that 
the dolcians, like the fagotten also, are quieter and 
softer in tone than the pommers. Hence it is perhaps 
because of their sweetness that they are named dolcians, or 
dolcisonates. This arises from the fact that, while the 
bodies of the pommers have equal length in a straight line 
and are quite open at the bell, in the base of the fagotten 
the length of the body is doubled back so that the hole from 
which the sound issues is at the top and in some cases (not 
in all, for it is sometimes 'open') covered and vented with 
little holes (as in some stops in the organ mentioned in 
Part IV). Hence the tone is necessarily not so strong, but 
softer and sweeter. In the same way as in the 
organ, the principal and trombone registers having their 
correct length and diameter throughout, sound much stronger 
and brighter than the 'stopped' ones and other 'stopped' 
reed registers; and this for the reason explained above.

C is the lowest note of the choirst fagott, F' of the 
doppel fagott, though it is to be noted in passing the 
doppel fagott is of two kinds: the first is so pitched that 
one can obtain low F', as on the gross bass pomer and is 
called quint fagott: the other, however is the quart fagott, 
which can be employed only down to G'. The latter can be 
used most suitably in the natural key, the former, on the 
other hand, in flat keys: and it is very convenient, when 
the instrumentarium includes both these kinds; for the 
semitones cannot be so well produced from the holes covered 
by keys as through those which are fingered.

Now the Meister who made the octave trombone is said to 
be at work on a large fagot-contræ which will sound the C'' 
of the sixteenth foot octave a Fourth below the doppel-fagott, 
and thus an octave below the chorist-fagott. If he succeeds 
it will be a splendid instrument, the like of which has never 
before been seen, and will really be something to marvel at;
organ builders have up to now experienced great difficulty in producing clearly and well the lowest notes D' or C'' in the sixteen-foot octave of the large trombone register. Time will show.\textsuperscript{32}

The terms single and double refer to the compass and pitch of the particular instrument. The recognized musical scale in England during the sixteenth century was based on the notes from G on the lowest line of the bass staff fo e on the treble. Playford, in his \textit{Introduction to the Skill of Music}, 1661, states that the usual compass employed by Morely and other composers at the close of the Elizabethan era was confined with these limits: but, he adds, "There are many notes used, both in Vocal and Instrumental Musick which ought not to be omitted;" and "those below Gamut in the Bassus are called double notes. I have therefore expressed them with double letters."\textsuperscript{33}

Praetorius corroborates these words by informing us that in England the fagott, descending to single G (gamut), was called the single courtal, and an instrument was being constructed to reach the double which would be called the double courtal.

While Praetorius speaks specifically of the single and double courtal, he does not make particular reference to the smaller varieties of the instrument. This is in support of the theory that the most popular of these instruments were the lower tones; the ones that had the most practical uses supporting bass lines and giving the tone color and sound desired.

Again consorts were built but little used, the instrument proving more valuable as a bass to other instruments. As late as the 1680's before the remodeled or classical bassoon replaced it, works by Buchner and others include a fagotto (i.e. courtal) in an otherwise stringed orchestra.
Some establishments preferred the deeper-pitched Quarte-Fagott descending to G' (the ordinary went down to C) and it was almost certainly one of these that Bach employed in cantatas 31 and 155 (1715-16). The smaller curtals seem to have been valued in Germany and Spain by shawm bandsmen when something a little softer than shawms was required for church use.

Baines makes a very interesting observation pertaining to the overall pitches of reed consorts developing at that time.

The pervading deepness of the sixteenth-century consort reed instruments is altogether a most curious thing. None of the usual types could reach the higher notes of the treble stave (the shawm could do so, and so could the bagpipe, but these were not used in the musical consorts). It was rather as if our woodwind had grown to consist of ordinary flutes on the one hand, and only deep basset horns, heckelphones, and bassoons on the other. Praetorius describes a promising-looking consort of oboe-like Bassanelli and several German courts owned a set of them: with double reed, straight-through conical bore, and soft tone. But they were deeper-sounding than ever; the bottom note (seven fingers) of each size was a fourth lower than that of the corresponding normal consort size, thus: in the treble d; tenor G; bass C. A kind of consort of bass oboes; and the racketts, were even deeper.

The pitches of these instruments are being compared by Baines to the pitches of a consort of flutes, i.e. treble a', tenor d', and bass g.

MERSENNE

Another invaluable manuscript to the historian is the work of Marin Mersenne. His *Harmonie Universelle*, included a section entitled, *The Books on Instruments*. Originally printed in 1635 it was translated by Roger E. Chapman in 1957. Mersenne includes 25 "propositions" or Chapters. Chapter XXXII deals with "Bassons, Fagots, Courtaux et Cervelats de Musique."
Mersenne's chapter on the bassoon is quoted in its entirety in Langwill,\textsuperscript{38} however he does not elaborate on it to any extent. This is regrettable because there are some aspects of development that Mersenne describes that warrant further study.

Mersenne begins:

I have dealt with these kinds of bass instruments because they can join in concert with oboes and because they are somewhat different from the preceding bass oboe in that they are in two parts to enable them to be carried and handled more conveniently. That is why they are called 'fagots,' since they resemble two pieces of wood which are attached and 'fagotes' together.\textsuperscript{39}

This description differs slightly from the pictures that are included in his manuscript. There is no indication in the diagrams that the instrument is actually divided into parts, other than the bell or cap which is removable. He does, however, later describe the joining at the bottom: "C is the mount, or shoe, of brass or other metal which brings together the two branches of this instrument when the latter is not made in a single piece."\textsuperscript{40}

Either Mersenne's descriptions are inaccurate in the instance of the fagots or no instruments of similar type have survived. The curtals that are in museums that are described in any detail in collection summaries, or those that have been observed by the author, are in one piece except for two examples which are in the Vienna museum. The first of these (C.199) possibly comes apart in the middle between the right and left hand finger holes, and the second (which is the only example of an early three piece curtal) has a long joint, wing joint and butt (C.201).
Mersenne describes in detail the courtaut, which was a cylin-
drically bored instrument similar to the bassoon, which had wax
stoppers and alternately drilled holes for right or left handed
players. Pulver in his Dictionary of Old English Music incorrectly
uses this description of the courtaut to be a physical description
of the curtal, another instrument entirely.

Mersenne describes the bassoon as being slightly different
from the fagots that he describes earlier. "As for the bassoon which
consists of a single shaft of wood, it is simple to understand its
construction and accessories from what we have written about the
preceding fagots." He states that the bassoon has four keys because
its lowest note was lower than that of the other instruments.

Mersenne's last statement about the bassoon comments upon the
conical shape of its bore.

But it must be noted that the hole, with which the
bassoon is drilled the whole length, that is to say its
duct, is straight at the beginning and flares up to the
end. This occurs similarly with the oboes and the cornets.
This renders their tones more violent than those of the
instruments which are drilled with a single thickness from
the beginning to the end.

The effect of the conical bore upon the sound of the bassoon is a very
definite phenomenon. Langwill makes reference to this when he states:
"Theorists and even bassoonists often underestimate the influence
which the construction of the tube has upon both the intonation and
tone-color of the bassoon." (Note: a study on the bore of the tenor
joint will be reviewed later in this paper.) Langwill further states
that:

The bassoon has an apparently continuous conical bore
and, throughout the history of the instrument the degree
of 'conicity' has constantly been altered to accord with improvements otherwise. Certain portions of the bore are parabolic rather than conical."

It would seem that the instruments that are being described in this chapter would vary greatly in the accurateness of the bore, a factor having a definite bearing on the sound of each particular instrument.

Mersenne makes a distinction between the bassoon and fagot, indicating that the bassoon was made of one piece of wood and the fagot of more than one. Grassineaus' Musical Dictionary gives as a definition of curtal: "Curtal, double, a musical wind instrument like the bassoon, which plays the bass to the Houtboy." One must remember that this definition comes in 1740, nearly a century after Mersenne. He also describes bassoon as "a musical instrument of the wind kind, serving as a bass in concerts of wind music, as of flutes, hautboys, etc. To make it portable it is divided into two parts."

His definition of bassoon is probably the result of an inaccurate translation of Mersenne's manuscript and of the confusion of the nomenclature. "Fagot" was a two pieced instrument and the "bassoon" was described as a one pieced instrument.

DESCRIPTION OF INSTRUMENTS

Nürnberg

In the German National Museum in Nürnberg two good examples of the choirstfagot or double curtal were observed by the author (MI 125 and MIR 403). They were both made by Johann Christoph Denner
in Nürnberg towards the end of the seventeenth century. The name J. C. Denner encased in a scroll with a "D" underneath is burned into them. They are both made of one single block of wood with detachable caps instead of bells. The caps are turned like fine furniture and have small holes running in a single circle around the waist of the turning. The top is also pierced with small holes.

There are six fingerholes in the front and a swallow-tailed open key. In the back there are three holes, the bottom one being covered with an open key. Both keys have protective, decorated covers. The keys are all finely made and covered with scrollwork etched into the metal. The difference between the two instruments is that MI 125 has all metal work done in silver, and MIR 403 is of brass.

The wood has a vertical graining and is probably maple. The butt cap is of metal in each instance and each instrument also has a metal ring around the top before the beginning of the bell. The small bore in each runs the left side of the front of the instrument.

Paris

In the Instrumental Museum of the National Conservatory of Music in Paris, France, a single curtal was available for study. The author was most fortunate to have access to the notes of William Waterhouse, who had made observations for a new catalog for the museum. This afforded the opportunity for comparison of observations.

The catalog number of this particular instrument is El213 C1119. The burn stamp was AJDAO in large letters. The instrument dates from the early 1600's. Made from a single piece of wood it is of lighter color than the Nurnberg examples. Mr. Waterhouse made no comment as
to the type of wood, but because of the color it can be assumed that
the instrument is made of pear. The bell is not a separate piece,
but is a part of the instrument itself. The key work is brass and
so also is the bocal. There are no protective caps on the two keys,
but they appear to have been removed at some date. Brass rings rim
the fingerholes and there is a ring for a neck strap. Mr. Waterhouse
states that these are not original. This observation must be accurate
because Praetorius and Mersenne do not describe rings being used in
keyholes. There is also no record of the use of neck straps in this
period of history.

Mr. Waterhouse also stated that the keys themselves were not
original, but were restored. He gives no indication of any restora-
tion date.

Vienna

In the Art History Museum in Vienna, examples of different
types of curtals are preserved. Of nine examples, four are of
particular interest.

Number 198 is a choirist fagott. This instrument is in one
piece except for a detachable bell. It is not muted. There are two
keys—a swallow tail in front and a single key in the back. This
instrument differs from the two in the Nurnberg collection in that
the key covers the middle hole in the back and not the lowest. Both
keys have protective covers with decorations. No makers' mark appears
on this instrument.
Number 199 is a doppel-fagott. This instrument appears to have been made in two pieces and held together in the middle (between the right and left hand fingerholes) with a decorative wooden band. This instrument has two keys, again a swallow tail in the front and a single key in the back which covers the middle hole. This instrument was to be held right hand above the left, although it possessed a double front key, because the small bore is not on the left of the front as is normal, but rather on the right.

Number 201 is a three-piece dulzian. This instrument possesses a wing joint, butt joint and long joint. It is the only surviving example of a three-piece dulzian. The wing joint does not protrude over the long joint, but is a straight piece of wood. It is wider than necessary for the bore, in order to have the obliquely drilled holes necessary to bring the holes within reach of the player. There is a small metal extension at the top for placement of the bocal. It has only one key, a double key, set at a slight angle (towards the left of the front) to bring it more easily within the player's reach. There are three holes on the back of the instrument, but no key. Langwill lists this as a two keyed instrument, but notes the D key is missing. This would have been a key to be used with the left thumb, rather than the right as was normal, because of the positioning of the holes in the back of the three pieced instrument. There is only one hole in the butt of the instrument and two in the long joint. There are three metal bands not previously described, one each at the bottom and top of the butt joint and one directly below the key.
Number 117 is by far the most ornate instrument of this period observed by the author. This dulzian has four keys, all ornately etched and made of brass. On the front is the usual swallow-tailed open key. The remaining three keys are on the back. The bottom two keys are fitted so that closing the bottom key does not close the next but the second key will close the bottom one. This principle is similar to the key mechanism previously described on the gross bass pommer. The keys are all double keys, possibly enabling the player to chose which hand position he preferred.

The bell is open and has three small holes approximately the size of a dime spaced on it. The wood is very light in color. On the metal rim is the verse:

Der. Dulcin, bin. ich. genant.
Nit. einem, iedem. wol. pekat.
Der. mich. vil. recht. pfeifen.
Der. mus. mich. wol. lerne. greifen.

Langwill translates this verse:

The Dulzian am I called,
Not well known to everyone.
Whosoever will play me correctly,
Must learn well how to finger me.


5Ibid., p. 57.


18 Ibid.
19 Praetorius, op. cit., p. 22.
21 Ibid., p. 19.
22 Ibid., p. 18.
23
<table>
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<td>C</td>
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25 Ibid., p. 103.
26 Ibid., p. 102.
28 Ibid., p. 5.
36 Ibid.
37 Mersenne, Loc. cit.
39Mersenne, p. 372.
40Ibid., p. 373.
42Mersenne, p. 372.
43Ibid.
44Langwill, The Bassoon and Contrabassoon, p. 147.
45Ibid.
47Ibid., p. 45.
48Langwill, The Bassoon and Contrabassoon, p. 31.
CHAPTER 3

THE EMERGING BASSOON

The next stage in the development of the bassoon dates from its division into four pieces. By means of the addition of the bell joint and the third key, the instrument was able to play Bb'. By the year 1785, some 150 or more years later, the bassoon had six keys, but was still a rather primitive instrument.

In England the instrument was called the French basson, until it became bassoon sometime near 1706.¹ During the same time it continued to be called curtal. In German speaking countries the terminology was also confusing. Dulzian and fagott were used interchangeably. To make matters worse, the term basson was also used.

Further increasing the confusion, the curtal itself (i.e. 2 keyed dulzian, distinct from the bassoon proper) continued to be used. Eisel, a musical scholar of the early eighteenth century, disposed of this instrument when he made the statement in 1738 concerning the dulzian:

The Teutschen Bassons, dulzian Fagotte or Bombardi, as used by our German ancestors before Music had become clothed in Italian and French fashion, are no longer in use and accordingly it is unnecessary to waste paper with a description of them. He who is a connoisseur of antiques can inform himself about them from the accompanying chart.²

As with the emergence of the curtal, it cannot be said with accuracy when the first four sectioned, three keyed bassoon was constructed. Mersenne, however, does describe an instrument having four keys. The drawing he uses does not indicate the positioning
of the joints, except for slight indications of the wing joint and the connection of the bell joint. The instrument was supposed to be able to reach B♭'. The placement of the keys is rather unusual in that the D hole is not covered with a key as most jointed bassoons are, but is simply an open hole. The E hole is covered with a key, as are the C and B♭'.

Bessaraboff in his book *Ancient European Instruments* makes the statement that "... the bassoon was made in one piece, this period ending in the second half of the eighteenth century." Mersenne's manuscript was published in 1635, evidence of jointed instruments over a century before Bessaraboff indicates that they existed.

A painting attributed to Harmen Hals, son of Frans Hals, is in the Art Museum of Aachen. Entitled, "Der Fagottspieler," it shows the bell-joint, the crook, the reed and the upper parts of the long and tenor joints. As Harmen Hals died in 1669 it could logically be dated circa 1650.

A complete view of any early bassoon is given us by Johann Christoph Weigel in his *Musicalisches Theatrum*. This work is undated, but Langwill attributes it to the period 1715-1735. The bassoon is being played by a left-handed bassoonist. There is a forked key on the front of the instrument. Since the rear view of the instrument is not available to the observer, one has to guess at the number of keys on the back. With the presence of a bell joint, there must have been at least two keys on the back of the instrument. The wing joint actually does have a wing and the upper
three joints are finely molded. Although Weigel was from Nurnberg, it seems that the gardens in the background of the picture should be attributed to either France or Vienna, because of their ornateness and formality.

Underneath the engraving is the verse:

Wo Orgel und Regal auch Clavizijübel fehlen,
und selbst der Violin, in Suma Fundament,
dä kan man meine Stim zum besten Grund erwehnen
der starck getriebene Hauch und aufgeweckte Händ
erzwungen solche Thôn, darob man sich verwundert
und die sonst schaffe Sell zur Frühlingskeit ermuntert.

Lengwill translates this as:

When the organ, the regal, and the harpsichord are inadequate, and even the lowest notes of the double bass, then for the best bass my preference is for the bassoon; such notes are produced from it, by steadily expelled breath and deft hand, that they rouse the listener to wonder and instill joy in his spirit, hitherto unmoved.  

A century prior to this drawing (1636) the first printed use of Bb' occurred in a Venetian publication. This was used in a solo for bassoon by Bartolome' de Selma y Salverde.  

The instrument this composer had in mind was probably more like the instrument of Mersenne than the later instrument of Weigel. Mattheson in Das Neueröffnete Orchester (1713) indicated the normal compass of the bassoon as being from C to f' or g'. He does state however, "Occasionally it produces contra Bb' and A' in addition." To reach the Bb' there must have been a third key and to reach the A', good breath support and a very loose embouchure.

Any bassoonist will appreciate Eisil's statements about the prerequisites of a player:
1) A good Reed (the best are made in Berlin)
2) A quick tongue
3) Adroit fingers
4) Daily Practice
5) Inborn natural disposition and a good pair of lungs.\textsuperscript{11}

**TALBOT MANUSCRIPT**

Anthony Baines published a summary of a manuscript by a James Talbot written in England sometime near 1685.\textsuperscript{12} This manuscript describes and measures a large assortment of instruments of that time, including a bassoon.

James Talbot was a Regius Professor of Hebrew at Trinity College from 1689 to 1704. He was educated at Westminster School, matriculated in 1683, and became a Fellow of Trinity in 1689. He obtained information of the various instruments from well-known London players.

Although there is no date on the manuscript notes, Baines was able to ascertain that it must have been written before 1701 because Mr. Finger, who provided information for the writings, departed from England in that year. King Charles II (1660-1685) is mentioned in the manuscript when a statement is made of the use of the sacbutt. "It was left off towards the latter end of K.Ch.2d and gave place to the French bassoon."\textsuperscript{13} This note was evidently written by William Bull the most celebrated London maker of brass instruments of that time. It is with these two clues that he dates the manuscript c. 1685. This mention of the French bassoon is important because it indicates the increasing importance of the instrument. It was less primitive and overpowering than the sacbutt, and more flexible and useful to the music of the period.
Not much is known of Talbot other than this manuscript, and his reliability cannot really be assessed until more is known of him. However, the many corrections in the manuscript measurements indicate that he was attempting to be accurate in his recordings.

The bassoon described had four joints and three keys, giving it a range from Bb' to g'. Of particular interest is the fact that the "basson" is measured and described, and that a fagot is mentioned but "disused." Talbot also stated that the "basson" has four "Joynts" and the fagot "entire." This is in direct opposition to Mersenne's statement, "That is why they are called 'fagots,' since they resemble two pieces of wood which are attached and 'fagoted' together." In this article, Baines makes reference to the one piece quart-fagot as a distinct instrument in his statement about the double bassoon. So it would seem that in England the jointed instruments at this point were referred to as basson and the fagot was a single pieced instrument, i.e. curtal.

THE ADDITION OF KEYS

The first chromatic key added to the bassoon was the Ab key. This key was placed on the front of the butt joint to the right side of the F key. It was the first closed key. This was the standard bassoon for the most of the eighteenth century, and Mozart's concerto was probably performed on it. This was also the best bassoon that Bach and Handel probably knew.

In The Muses' Delight (1754) the four keys are described as follows:
Great key on the Double piece, stopt with the little finger, R. hand (F key)
Little key on the Double piece, opened with the little finger, R. hand (G sharp key)
Lowermost key on the middle piece, stopt with the thumb, L. hand (D key)
Uppermost long key (Double B-flat key) \( \frac{\text{F}}{\text{E}} \) stopt with the thumb, L. hand (low B-flat key) \( \frac{\text{Bb}}{\text{Bb}} \)

Diderot and D'Alembert published an *Encyclopédie* (1751-65),\(^{16}\) which included a section about the bassoon. The encyclopedia also included a fingering chart for a four keyed instrument. The compass of the chart was \( \text{A}' \) to \( \text{a}' \). \( \text{A}' \), \( \text{Bb}' \), and \( \text{B}' \) natural were played "'sons deboucher aucun trou, par la seule maniere de pousser le vent dans l'instrument' (i.e. without uncovering any hole, but solely by the manner in which the instrument is blown)."\(^{17}\) A reprint of the drawing of the detail of the instrument is reproduced in Langwill's, *The Bassoon and Contrabassoon*.\(^{18}\)

The addition of the Eb key came in 1775.\(^{19}\) This key was placed parallel to and inside of the D key on French and English instruments, and was opened with the left thumb. The German makers generally placed it on the front of the long joint (left little finger).

The F sharp key, (opened with the right thumb and placed below the E hole) was most often the sixth key. There is an example in the Heckel collection (F5), however, that has the F sharp as the fifth key (although it was added to the instrument), instead of the E flat.

In Exeter, New Hampshire, in 1807 a series was published entitled the *Instrumental Assistant*. The section for the bassoon was compiled by Samuel Holyoke, A.M.\(^{20}\) The description of the
six keyed bassoon that he wrote was included in its entirety in Bessabaroff's *Ancient European Musical Instruments*.

The bassoon has 14 holes, as represented by 14 lines in the Scales [the fingering chart], 8 of which are stopped with the thumbs, and fingers, and 6 with the keys. The first 6 holes are stopped with the fingers. The 7th, with F, or great lower key. The 8th, with A flat or G-sharp key, which is the small key at the bottom.

The 9th with the F-sharp key, or the key governed with the right thumb. The 10th, is the right hand thumb hole. The 11th, with the long key above the right hand thumb hole, which is governed with the left hand thumb. The 12th with the small key above the right hand thumb hole which is the E-flat or D-sharp key.

The 13th is the left hand thumb hole. The 14th with the upper long, or double B-flat key, which is the lowest note on the Bassoon; to make which you must stop at once with your left thumb, two keys and one hole, as may be seen by the scales.

OTHER DEVELOPMENTS

In comparison with today's instrument, the eighteenth century bassoons were wide in the crook and narrower in the butt and long joint. The bell contracted to a narrow waist to soften the tone of the lowest notes, and also partly to even out the resonance of the instrument as a whole.

The beautiful molding of the bassoons of Denner and others (see examples at end of chapter) was given up probably to keep the instrument stronger (thicker). The molding besides being decorative, had served the purpose of providing a place for the keys to be fastened to the instrument. In place of this on some instruments long raised wood humps were left along the long joint the length of the keys (to support the key and further strengthen the hole opening itself). On other instruments "saddles" of wood were used at the
points to which the key was pinned to the instrument.

Saddles of brass were used along with these wooden devices to pin the keys to the instrument. The saddle consisted of a base lying flat along the instrument with walls that stood perpendicular to the base. The base was screwed to the instrument and the walls provided the pinning place for the lever mechanism of the key. The sides were sometimes rounded.

Keys themselves were generally made from brass. Wood, ivory and silver were rarer materials. The shape of the key plate varied and was most often some type of rectangular or square form. Some oval keys were also in use. No matter what shape the key was, all of the pads were flat flaps of leather attached to the key.

Considering that this leather was a porous material, the key settings imprecise and the brass springs sluggish, the closure of the keys was far from perfect. The successive addition of more keys necessitated the improvements the keys and pads were to undergo in the next stages of development.

The swallow tailed F key on the front of the butt joint persisted long after it was impossible to use. Because of the addition of the Ab key, to the side of the F key, all instruments had to be played with the right hand on the bottom in order to use the key. Possibly it continued to exist for those players who were used to performing in the opposite manner. They could simply use the instrument in their normal way, ignoring the presence of the new key. In addition, tradition possibly was a factor with both the makers of the instruments and the players who purchased the instruments. One must admit that the swallow tailed key was somewhat
more attractive than a single key would be.

The hole at the bottom of the instrument where the two bores were joined was filled with cork. A protective plate or shoe was added to this during this stage in the instrument's development.

Low B' natural along with C sharp and Eb were generally avoided by composers during this period, unless the bassoon was doubling a line with other instruments.

THE BASSOON IN ENGLAND 1750-1800

Eric Halfpenny published an article in the Galpin Society Journal entitled, "The Evolution of the Bassoon in England 1750-1800." His remarks include observations about bassoons with from four to eight keys. A review of this article is important at this time, because he makes observations about the physical improvements of the bassoon that are impossible to make without the specialized equipment that he used, not to mention the availability of instruments of the period for the long period of time necessary to this type of study.

He begins his article with an important observation about the study of the history of the development of instruments.

Woodwind history tends to be concentrated on the evolution of mechanism as a convenient yard-stick by which to measure progress. Yet it becomes increasingly evident, the more one studies woodwind instruments, that most of them were subjected to development and change in ways unconnected with the number of keys which happened to be put on them.
This statement is particularly true with the bassoon because of the dependency of the tone of the instrument on the shape and design of the conical bore. (This has been referred to in the previous chapter.) Changes in the tonal requirements for the bassoon by composers also brought about changes in the physical aspect of the instrument.

At the beginning of that period the bassoon was primarily an instrument of the general bass in the baroque ensemble, blending its tone with a diversity of other instruments in a limited number of stock situations. At the end, it was being required to stand alone and apart from other bass instruments as part of a much enlarged wind choir, whose growing freedom and independence of utterance was based on a closer understanding of the technical character of each instrument and of the ways in which the different species could best be combined.24

The characteristic tone of the bassoons used in the Baroque orchestra was full and soft and capable of blending with and reinforcing other instrumental sounds without overpowering them. The later bassoons were produced that had a much greater sonority and spoke more clearly, giving the instrument the independence necessary to serve as the bass to the wind section. He summarizes these changes by stating the characteristics of the bassoon of 1750 and of 1800.

**CHARACTERISTICS c. 1750**

1. Long wing joint with the upper end level, or nearly so, with the shoulder of the upper tenon of the bass joint. The wing is grooved for the bass joint only to just above the e paule carrying the finger holes, so that the upper round portion of the joint stands clear. The e paule is rounded in contour. The fingerholes are fairly large and there is a tendency for the lowest notes to be the smallest of the three. Despite their depth, the wing fingerholes are sometime undercut.

2. Butt joints are broad and flat by reason of the side spacing of the two channels. The fingerholes are only slightly larger than those on the wing. The thumb hole is comparatively small. The Ab hole under the small key is high up on the joint and diminutive in size.
3. The most noticeable detail of the bass joint is the extremely small thumb hole.
4. The bell has a baluster contour, concealing a plain negative cone taper (i.e., a contraction, in opposition to the general expansion of the bore).
5. The number of keys is four, and the brass ferrules are very narrow; ferrule is the metal protection on the end of each joint.

CHARACTERISTICS c. 1800

1. The wing joint is shortened by varying degrees, and is grooved for the bass joint almost to the top ferrule, so that it fits snugly against it all the way up. The epaule becomes progressively angular in contour and is carried round to the back of the joint. The wing holes are reduced in size, with the highest markedly the smallest of the three.
2. Butt joints become narrower and more rounded as the two channels are brought closer together. The fingerholes are decidedly larger than those on the wing. The thumb hole increases in size. The Ab hole tends to be placed lower down.
3. The thumb hole on the bass joint becomes much larger.
4. The bell is given a pronounced internal and external flare in the upper half of its length, but is 'chocked' very slightly at the waist.
5. The number of keys is six and upwards and the ferrules increase in depth.\(^{25}\)

Included in this article is a summary of the fingering charts given in various methods books of the period. Of special importance is the inclusion of a fingering for Eb in the lowest register for a four keyed bassoon. The method was to close the Bb' key, the C hole and all of the front holes and F key. The D key was not depressed.

He makes a very important observation regarding the lack of crooks preserved with instruments. Often the crook and crook socket were changed when the general pitch became higher (rather than disposing with the entire instrument) destroying the original sound of the instrument. Quite often not even an altered crook is available
with the instrument. Contemporary crooks on present bassoons do not satisfy the needs of these instruments and for proper study of the sound, new crooks must be made to fit the specifications of these old instruments.

Mr. Halfpenny includes X-ray pictures of the pieces of several examples of bassoons of the period that he discusses. The interior of the bores is clearly visible, and of particular interest is the lie of the fingerholes on the wing joint. From just an exterior view, the large angle from the perpendicular at which these holes are placed is not an observable factor. Similar pieces are included in each photograph (all bell joints, butt joints, and wing joints). He dispenses with the long joint saying that they were merely large and uncomplicated. It would have been an even more rewarding study, if even one instrument would have been x-rayed in its entirety, to enable one to see the shape of the bore as a continuous entity. Nevertheless, the division of the bores in the butt joint is readily observable and the contraction of the bell joint bore clear.

DESCRIPTION OF INSTRUMENTS

Nürnberg

An example of a very early three keyed bassoon was observed in the Nürnberg Museum (MIR 404). The museum dates this instrument c. 1740. They also give the name of the maker as being Kingsperger, but the burn stamp observed by the author read:

.J.W.
.KENIGSPERGER.
The spelling "Kenigsberger" agrees with Langwill's list of instrument makers.

The instrument is made of maple and the keys and ferrules of brass. There are horizontal burnings on the instrument. However, they are worn away where the bands of the player would have been placed, indicating that the instrument was used considerably.

The wing joint has a definite wing for the fingerholes, but it stands far away from the long joint and the wing does not fit over it. The top end of the long joint has a bulbous swelling. The bell swells out from where it fits on the long joint and then in about two thirds away from the top and then out again. It is somewhat similar to a long balloon tied in the middle with a wide ribbon.

The keys on the back of the instrument are each held with two large saddles or platforms of wood. On this instrument these saddles are rounded, rather than squarish as is the case on other bassoons. Pins through the saddles hold the key to the body.

The bores are plugged at the bottom with cork. The ring protecting the bottom of the butt does not fit properly and is held in place with a screw. It could possibly be a replacement. It seems inconsistent with the quality of workmanship of the rest of the instrument. One might note that this was not a complete cap but merely a ring, probably to help support the binding of the two bores. The cork filling is clearly visible.

The F key is held with saddles of brass. It is a double key with one scallop just before the first saddle.

A very beautiful example of an early 18th century instrument was observed in the Nurnberg museum (MIR 407). No burn-stamp was
visible. The body of the instrument is maple and the keys (four) and ferrules are made of brass.

The wing joint and bell of the instrument are turned like fine furniture posts. The wing itself is abruptly thicker, to accommodate the fingerholes. It is flattened in the back to fit more closely to the long joint. At the tip of the wing joint is a metal fitting to hold the bocal. It is too large an opening for the bocal that is with the instrument, indicating the bocal is probably not original.

The F key is a double key, although there is an Ab key. The keys on the butt of the instrument (F and Ab) are fastened to the instrument by means of a metal saddle. The pads are square, but the edge of the top of the double F key is scalloped for decoration. The body of the bassoon is flattened under the pads to enable the pads to fit tighter.

The bottom of the butt joint is extremely narrow, approximately two inches in width, and has a brass cover.

The keys on the long joint are fastened to the instrument by means of wooden saddles. The saddle nearest the pad runs entirely around the instrument, giving the instrument a molding. The saddle nearest the point at which the key is depressed is merely two humps of wood and not a complete molding. Metal pins run through the wood to connect the key to the instrument. On many instruments of this period the keys were merely flat pieces of metal. This instrument is different in that the keys on the back of the long joint are curved and not flat. The inside of the curve is toward the body of the instrument.
A very early example of a four keyed instrument is the third instrument observed at Nurnberg (MI 127). The museum attributes it to Johann Heinrich Eichtentoph in Leipzig (c. 1730). Langwill gives his lifetime as being 1678-1769.²⁶ This bassoon was made of a light colored wood. There are some horizontal burnings on the bell. The keys and ferrules are made of brass.

The back keys are again held to the instrument with wooden platforms and the front with brass. The fingerplates of the back keys are very broad, possibly to assist the player in being able to depress both keys and still cover the C hole. The F key is a scalloped double key. The Ab key placed beside it is also scalloped.

One begins to wonder why the front keys were ordinarily held with brass and the rear with saddles of wood. Research has given the author no answer to this question. However, some conclusions are possible. The wooden platforms would wear sooner with use, but were possibly necessary to support the larger keys. It is probable that with the complications that the double bore already gave the butt joint, wooden saddles were impractical. It seems also that the makers were more proficient in working with wood than with metal and therefore they used wood when at all possible.

The wing joint fits fairly close to the long joint and has a definite wing. The bell is contracted near the top and has a decorative band around the top. The amount of the wood is exceptional at the top of the bell, being about a half an inch thick.
Paris

A very unusual instrument in the Paris Conservatory (C 1120) was studied. This instrument has only two keys although there was a bell. The instrument is made of maple and the wing is very pronounced. It seems to have possibly been an addition to the main part of the joint, although that would have been very difficult to do.

The most interesting and different aspect of this instrument is the presence of a rather unusual bell. It is made of metal and was shaped somewhat like a toilet tank bulb (5-6 inches in diameter).

The two keys (F and D) are both single and the pads are slightly oval. They are held to the instrument with brass saddles. The butt joint has a curious indentation that starts above the thumb hold and continues down almost the entire length of the joint.

No burn stamp was observed and no makers name or date was indicated in the notes of Mr. Waterhouse. It would be impossible to give it a date without any further information. The clues that one would use to give the instrument a date are too contradictory. The oval keys, and style of saddle and metal bell could date it near the nineteenth century, but the presence of only two keys and the molding of the wing joint would place it much earlier.

Stockholm

In the Music History Museum in Stockholm a four keyed instrument was studied. No makers mark was observable and the museum gave no indication of the maker. The instrument is made of maple and the keys of brass. The ferrules are all missing, although there are
indentations where they should have been. The bore is also of brass and appeared to be original. It is very thick at the point at which it enters the bassoon, being nearly the thickness of a little finger. The instrument was placed on a display wall and no accurate measurements were possible. It is of more normal size at the reed end.

The F key is double and both keys on the front of the instrument are plain rather than scalloped.

The long joint, wing joint and bell joint are all turned and molded. The moldings were identical to Weigel's engraving (which was displayed next to the instrument). Weigel's bassoon only had three keys and was played by a left handed player. While this instrument was similar, it had four keys and by the wear on the instrument was played by a right handed player.

Of particular interest about this instrument is that the wing joint separated above the wing and is therefore in two pieces. This probably was an early tuning device, although Langwill makes no mention of this kind of development.

The shape of the butt joint is also a little different. Being wide where the wing and long joints enter, it narrows down considerably where the fingerholes are and widens out slightly again near the bottom.

Heckel

The Heckel Music History Museum Catalog\textsuperscript{27} also has examples of bassoons pertinent to this chapter. Five from the collection will be discussed here.
The earliest bassoon that they include in their collection (Fl) is by Johann Georg Eisenmenger. They date the bassoon as c. 1650. Langwill however gives the date of Eisenmenger's birth as 1698, making it rather difficult for him to have produced an instrument in 1650. The presence of original Ab and Eb keys would date it after 1730, and although Langwill dates the Eb key around 1766-70, he dates Eisenmenger's death as having been in 1742. Either date could be inaccurate. However, since he is very specific about Eisenmenger's death and unspecific about the appearance of the Eb key, it is probably accurate to assume that the key date is the inaccurate one. With other clues (the closeness of the wing to the long joint, the shape of the bell and the lack of moldings) it is possible to assume that the date in the Heckel catalog is merely a typographical error and should read 1750 rather than 1650.

The instrument is made of maple as are the keys. The ferrules are of grooved brass. The pads are flat and square with oblique cuts on the two corners furthest from the key. There is a long wooden ridge running along the back of the long joint from top to bottom for the placement and support of the D and Eb keys.

The wing joint fits tightly against the long joint and the body of the instrument as a whole is fairly straight from top to bottom with the exception of the contraction of the bell. The long joint is only 6 mm. longer than the wing (476 mm. wing joint, 483 mm. long joint).

Although Eisenmenger was from Mannheim, the placement of the Eb key is on the back in the French style. There is a grooved
brass ring at the top of the bell joint and also a metal loop for a strap on the butt joint.

The second instrument in their collection (F2) is a four keyed Denner instrument attributed because of the burn-stamp (I.C. Denner in a scroll) to Johan Christoph Denner. It might be noted that Jacob Denner did not make bassoons.

The instrument is of very finely molded maple and the keys of brass. This was originally a three keyed instrument. The Ab key was added later.

The catalog notes indicate that the metal used was very thin. Also by the drawing one can see that the ferrules on the bass joint were not straight as was usual, but had delicate scalloping on the edges.

The keys on the butt joint are attached with brass saddles and the long joint with wooden moldings that ring the entire circumference of the joint.

No date is given for the instrument, but given Denner's dates 1655-1707, the moldings, and the limited number of original keys, one could very reasonably give it a date c. 1700.

The third example to be examined in the Heckel collection (F3) is a five keyed instrument with the maker's mark, simply DRESDEN. No particular maker is indicated. The Gresner mark (the most famous maker of Dresden) is always indicated the specific maker, i.e. A. Greser, Dresden or H. Grenser, Dresden. Therefore, it is possible that this instrument was made by a maker also of Dresden by the name of Grundman. Langwill lists him as a maker of four keyed bassoons,
but it is conceivable that he did make five keyed instruments. Langwill also gives his life time as 1727-1800. This does not quite coincide with the possible dates given by the Heckel catalog (1720-1750). The catalog is not specific about the dates, therefore, this still leaves Grundman within the realm of being the possible maker. No other maker is noted as being in Dresden during that span of time.

The instrument is of maple and the keys and ferrules of brass. The keys themselves are rather plain, but the ferrules are grooved. The keys on the butt joint are again attached with brass saddles. The Eb key is on the long joint in the front as was the German style and is played with the left little finger. It is also attached with brass. The long keys on the back of the long joint are attached with pins and wooden saddles. The saddles do not run the circumference of the instrument, but are rather more like blocks.

The wing on the wing joint not only goes over the front of the long joint but also wraps around the back of the long joint. The butt joint is filled with cork and covered with a brass plate.

The next instrument under consideration (F4) is attributed to the years 1740-1760. It is an eight keyed instrument, although it probably originally possessed only five keys. The Bb', D, Eb (back of the long joint), F (double) and Ab keys are all of similar shape and attachment. Notably the F and Ab keys are not attached with brass saddles, but rather with wooden ones, similar to the keys on the long joint. There is, in addition, an F# key and two wing keys (upper back of wing joint), that are of an unlike style and are attached with brass. The Heckel description gives distinct reference
to the two wing keys as being not original but neglects to mention
the F# key. It is because these three keys are alike that the author
must make the assumption that they are all not original. One further
note is that the F# key was not supposed to have been thought of
until sometime near 1785, much later than this instrument is dated.

The instrument is maple and the keys are all of brass. The
pads are flat. The original five have square pads with rounded
corners on the edge farthest from the key. The other three are oval.

The wing joint fits closely to the long joint and has a very
small extension over the rear of the long joint. The ferrules are
of grooved brass and the bottom is covered with a plate. The note
is made that the instrument is in very beautiful condition.

F 5 is a very similar instrument to F 4. It has five keys
of brass (Bb, D, Ab, F, a double key, and F#). It should be noted
again that the first four keys are attached with wooden saddles and
are of similar style, while the F# key is attached with brass and is
of a different style. This would seem to indicate that the key is
not original. This is not stated in the Heckel Catalog.

This instrument is slightly longer than the previous one
(F5-1245 mm and F4-1220 mm.), but everything else seems to be so
similar to the other that the assumption could be made that they
are made by the same maker (no makers mark is given on F5, although
there is a burn stamp on the bass joint of F4--the numbers 303).

There are notations that there is a missing Eb key but no
indication is given in the drawing as to where that key might have
been placed. The wing joint is worm eaten and the notation is also
made that the instrument is in moderately good condition.
No notes are included about F6 in the catalog. It has nine keys. Five seem to be original (Bb, D, Eb, back of long joint, F double and Ab). All of these are mounted in wooden saddles. There are also two keys on the upper back of the wing joint and F# key on the butt joint and a C# key on the front of the bottom of the wing joint. These are all attached by brass saddles and have octagonal-shaped pads. No makers mark appears on the instrument.

The back of the long joint appears to have a broad, flat area for the attachment of the keys. The wooden saddles seem to rise from this. A continuation of the flat area on the long joint is a slight projection which fits over the wing on the back of the wing joint. This has not been noted previously on any instruments that the author either has seen pictures of or has had the opportunity to study.


5Langwill, p. 9.


7Langwill, p. 29.

8Ibid.


11Langwill, p. 10.


13Ibid., p. 19.

14Mersenne, p. 372.


17Langwill, p. 36.
18. Ibid., p. 12.


23. Ibid., p. 30.

24. Ibid.

25. Ibid., pp. 31-32.


29. Ibid.

30. Ibid., p. 184.

CHAPTER 4

THE BASSOON IN FRANCE

It is the purpose of this chapter to trace the developments of the French bassoon from the late eighteenth century to the present. The French and German makers, although all striving to improve the bassoon, did so along different lines. The French attempted to preserve the characteristic tone of the bassoon, even though it was uneven in different registers. The German aim was to smooth this unevenness in the tone, and to enable the instrument to blend with other instruments rather than emphasize the differences. It might be noted at this point that the English tended to make their changes along similar lines as the French and, in fact, did also import instruments from France to be used in their country.

As well as improving the control on the tone of the different registers and of the individual notes that were problems, those who were improving the bassoon in France were striving to improve facility of fingering by means of additional keys. There are so many changes and improvements in the French bassoon particularly in the early and middle portion of the nineteenth century that it is impossible in most cases to attribute the mechanical and other improvements to certain individuals. However, it is through the combined work of Savory, Jancourt (a bassoonist and not a maker), Boehm, Sax and others, that weak notes were greatly improved and the overall tone developed.

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These changes were achieved without radical changes in the bore, as occurred in the German bassoon. By early in the nineteenth century the basic fingering system that is in use at the present was developed. Only minor additions and adjustments were made after this time and by the third quarter of the century the French bassoon was completely developed.

Although the addition of the sixth key had already created one difference between the French and German bassoons (The Eb on the front of the long joint on German bassoons and on the inside of the D key on the back of the instrument in the French instruments), the next two keys that were added were similar developments in both countries. They were the a' and c'' keys that were added to the back of the wing joint just before the end of the eighteenth century. These are closed keys worked by the left thumb. With the aid of these keys the upper part of the range was facilitated (to eb") and the bassoon became a melodist as well as a bass in the orchestra and woodwind section. It is this bassoon that was in use at the time of Beethoven's writings.1

During the first part of the next century the chromatic keys for Bb and c# were added, and following these the notes B' and C# in the lowest register. The French and German bassoons have different placements for these last four keys. It is with these differences that the French and German styles of bassoon were solidified.

It is impossible, because of the number of developments and the rapidity with which they came, to give a complete chronological
development of the instrument in France. The development is best approached with a summation of the efforts of the makers. When at all possible, credit will be given to those individuals directly responsible for improvements, as well as some indication of when these improvements occurred.

KEY ADDITIONS AND OTHER DEVELOPMENTS

The system of the fingering of the long joint (left thumb) is a major difference to be considered. The first French development was an open key over the C hole which keeps the D key depressed when the C key is pressed. The C# key was placed to the left of the C pad, and the Bb' was placed directly above it. B' is played by pressing both the Bb' and C keys. There is a closed B' hole on the bell which opens when the two keys are depressed.

The Eb key position to the inside of the E key has been discussed. On the butt joint a closed Bb (R3) was added. Rollers between F and Ab were used to facilitate movement between the two notes as they are both played with the little finger of the right hand. (Rollers were invented in 1823 in Paris by an instrument maker by the name of Janssen.2)

A closed key for C# (L4) on the lower end of the front of the long joint is attributed to Simiot of Lyons in 1808.3 After the C# key an eb key on the wing joint was added. It lies between L2 and L3 and is played by L3.

Other developments came with great rapidity. A tuning slide on the wing is attributed to both Savory (1830)4 and Winnen5 by
Langwill. (Note: In the previous chapter an example of an early eighteenth century instrument with such a device was described. This was a century before these gentlemen were supposed to have invented it.)

Pillar mounts instead of the old brass or wooden saddles were first made by Laurent in 1806. These were quickly used by instrument makers including those specializing in the bassoon in France and Germany. Rod axles invented by Boehm in 1823 were first used by Jancourt and Buffet-Crampon followed then by other bassoon makers. Cupped pads began to take the place of the older, flat leather ones. At first the pad was still flat and merely stuffed into a metal cup. It was at this same time the needle spring came into common use, being suited to the new rods and pillars. German silver was used to make keys beginning in the 1830's. Previous to these improvements in 1817 Simiot had first used a U tube at the bottom of the butt joint to connect the two bores. In 1850 Triebert slightly widened the bore cone to give the lower notes more fullness and at that same time began using the metal U tube that Simiot had invented in 1817.

In 1839 Adler displayed an instrument that was a little longer than was normal and had a smaller bell. He had added two new keys to produce high d" and e" (L2 and Ll). Although the sound was slightly different it was said to have been superior in accuracy, purity and evenness of tone. Jancourt and Triebert moved the G hole down slightly to give more stability to the A. A key for R3 was added to reduce the stretch
between R2 and R3. It was not until some thirty years after these developments that the rollers were added between the G and B flat keys (both played with R3). This addition was encouraged also by Jancourt who was at that time (1885) working with Buffet-Crampon.¹¹

Buffet also introduced a device for an alternate F. It is an extra key for RT which is brought around the butt. Depressing this key closes the open F key. This enables R4 to operate the Ab key facilitating the movements from F# to G#.

Experiments with various shapes of bell joints were carried on. Flares up to six inches in width, bulbs and metal were only three of the more radical attempts to improve the bell shape and style.

The first inventions to close the hole on the crook key were extension of the a¹ and a² keys on the wing. In 1845 Jancourt collaborated with Buffet-Crampon in the addition of a crook key (L4) which closed the pin-hole on the crook.¹² At a later date a duplicate mechanism was added on the back of the instrument (RT) to close the crook key.

Pierre¹³ attributes a key between R1 and R2 to Adler. The key facilitates trills between B/c#, c/c#, c#/d#, and d/eb in the middle register and also g'/a' and a'/b' in the upper register.

Sometime near the year 1850 Jancourt also suggested to Buffet the addition of a ring on the finger hole for the second finger of the left hand which would close a half-hole plate for L1. At nearly the same time they added rings on the second and third fingers of the right hand to improve the intonation of B natural.
An open pad was attached to these rings and would close whenever the second or third fingers were depressed. The B still tended to be flat and the half hole plate was not successful. Both of these devices were abandoned by 1875.

Still another key was added for the alteration of e' and g'. This is on the back of the wing joint and is operated with the left thumb. Its plate lies between the crook key and the a' key. This is referred to as the "Creation Key" because of the passage of the "doves" in the Creation\textsuperscript{14} which uses rapid alternation of these notes.

The right thumb plate was the last addition to the French bassoon and does not appear on all instruments.

Although not previously credited for specific developments, the makers Savory (\textit{pere} and \textit{jeune}) were probably the makers of the finest French bassoons. Their instruments were highly prized, particularly in England where they were used until the pitch was lowered. Savory \textit{jeune} used flamed sycamore and continued to use brass for the keys, instead of the increasingly common German silver.\textsuperscript{15}

OTHER BASSOONS INCLUDING THE BOEHM BASSOON

Experimental bassoons were constructed throughout the mid part of the nineteenth century by various makers with the intention of improving the bassoon.

Charles Joseph Sax made a bassoon with all covered pads in 1825.\textsuperscript{16} This instrument was made of wood. The idea of the covered
pads for the fingerholes led him to make a metal bassoon by 1842.\(^\text{17}\)
In turn this second instrument, made by Charles Sax, led Adolph Sax
to produce a 23 keyed metal bassoon.

In 1851\(^\text{18}\) Lecomte tried to improve upon these developments.
Adolph Sax had not attempted to duplicate the oblique angles of the
fingerholes in the wooden bassoon, but merely covered the tone holes
with pads. Lecomte added small tubes protruding from the bore for
the same distance that the fingerholes travelled in the wooden
instruments. Lecomte decided to use metal (German Silver) to give
greater sonority to the bassoon. The instrument spoke very well
and was indeed louder. However, it emphasized the differences of
timbre that naturally lie with certain notes on the bassoon, and
made it more difficult for the player himself to minimize these
differences. The instrument really sounded more like a saxophone
than a bassoon.

It was Triebert in Paris who first began experimenting to
construct a bassoon according to Boehm's acoustical principles which
had been applied so well to other instruments. His first attempt
ended in failure because he felt that it did not retain enough of
the true character of the bassoon tone.

In 1850\(^\text{19}\) Boehm produced a bassoon that was acoustically
sound. The instrument had lateral holes and the tone was easy and
certain, and accurate in intonation. The instrument did not include
a new fingering system, but was the same as other French bassoons.
He began working with Triebert to develop a simplified fingering
system. They did indeed develop an instrument with a "logical"
fingering system, but the long rods that were necessary made very loud clicking noises and had to be adjusted very frequently. The tone was accurate and even, but it did not sound like a bassoon. The high cost of the instrument probably had something to do with the fact that not many instruments were sold or bought. The instrument was priced at 1200 francs and a regular bassoon was selling for around 250 francs. Pierre stated that only three instruments were made, but Langwill states that he has found four in collections. No fingering chart for this instrument has been found by the author, although Langwill states that he does have one published by A. Marzoli (maker of two of the Boehm bassoons).

The German maker H. J. Haseneier made bassoons which seem to combine the fingerings for a German bassoon and a Boehm bassoon. This instrument and its fingering is described in the discussion of instruments in the Heckel collection later in this chapter.

DESCRIPTION OF INSTRUMENTS

Stockholm

An early Adler instrument was available for study in this museum. The burn stamp is:

Adler
Rue Mandar
a Paris

Above this signature is a crown. It might be noted that a K. F. Adler also made instruments about this same time, but signed merely:

Adler
Bamberg
This signature also was preceded by the same crown. An instrument by this maker is in the Heckel catalog and will be discussed later in this chapter.

The instrument in Stockholm was catalog number 2394 and was received by the museum in 1940. Having only nine keys, it is a good example of an early French style bassoon. The keys are black, perhaps with age. They do not appear to be of the common German Silver that began to be used in the nineteenth century, and felt very "tinny." The wood is also dark, and has no finish to it. Possibly the instrument has been exposed to something that has changed its appearance so radically. It does not seem that Adler, who was a well known maker of bassoons, would construct an instrument of poor quality.

Although the wooden ridge still is used to secure the keys on the back of the long joint, other aspects of the instrument show the first beginnings of the French development. The C hole is covered with a pad and holds the D key when depressed. The pads are fitted into round cups. The keys themselves are not flat but somewhat rounded. The first two wing keys (a' and c") are present. The other six keys are in the normal positioning for the French bassoon.

An interesting bell joint is used on this instrument. From the long joint the bell stays the same diameter for approximately one third the length of the bell. At this point it goes in straight and forms a shelf. It is then straight, but considerably smaller than before, for the next third. At this point there is a molding
which goes the circumference of the bell. The bell then flares slightly to the top.

From a summation of these clues the instrument could be dated 1800-1810.

A second instrument in the same museum (number 2463, acquired in 1954) is a considerably later design made by Lecomte. The burn stamp reads:

"Arsine-Zoe- Le comte" & Cinic
Paris
"Excelsior"

The date 1887 is placed under the burn stamp. On the ferrule on the bottom of the butt joint is the notation: KMA no. 2.

The instrument is made of maple and the keys are of silver. The pads are cup shaped. Posts and rods with needle pins are used. The crook (original) has a tiny pin-hole and the key is present (L4) to close it. The mechanism itself is missing past the first post.

Keys present are:

Bb'
B' (hole and mechanism)
C pad
C#
D
Eb
F#
Ab
F
Bb
c#
Crook
cb
a'
c" cb"
e"
This instrument is the standard French system bassoon which had been established by the 1850's. The bell is merely a straight extension of the long joint with a slight increase in size at the top, where a silver ring was attached. The crook is not inserted directly into the instrument, but is placed in a metal collar extension of the wing joint.

Included also on this instrument is Jancourt's suggestion for rings and pads for the right and left second and third finger-holes. The rings have been removed from the wing, but the rings and pad on the butt joint are intact.

The c♯ hole and pad had been moved. The original hole for the note had been filled in and another hole drilled slightly above it.

**Copenhagen**

There were two instruments in the Copenhagen museum that are pertinent to this chapter. As in Stockholm, these are early and late examples of French development.

The earlier instrument (E44/111) was given to this museum by the Instrumental Museum in Bruxelles in the year 1898. The signature is:

**BAUMANN.**

A **PARIS.**

Above the printing is a small star and a shield and below a larger star. This instrument is an earlier instrument than the eight keyed Adler viewed in Stockholm.
It has seven keys: Bb', D, Eb, F#, Ab, F and a'. There is no pad on the C hole. A long hump in the back of the long joint is present. The keys, bocal and ferrules are made of brass. The pads were oval and flat. The keys were held with saddles.

There is no ring of any kind of the top of the bell. The bell itself comes straight from the long joint and ends in a slight bulb. The wood was of a lighter color, but has a dark finish.

Noticeably different about this instrument is the fact that the butt joint is almost a perfect oval, and although approximately the same length as other instruments, the instrument seems slightly smaller because of the smallness of the bore.

The second instrument in Copenhagen under consideration is number 1970-2. It was made by Buffet-Crampon in Paris and the serial number is P or F 26 on the butt joint. The letter was indistinct and difficult to distinguish. The body of the instrument was of teak and the ferrules and keys were made of silver. The instrument has the same seventeen keys as described on the Lecomte (2463) in Stockholm, plus an additional three. (When counting keys on a French bassoon one must include the B natural in the lowest register, because even though there is no special key for this note, there is an extra hole and an additional mechanism attached to the Bb' and C keys.)

The bocal mechanism on the front is duplicated with a key for LT. This is also attached to the a' and c" keys on the back. There is an additional key on the front of the wing joint not previously described in this chapter. No reference is made to this in any history or in any fingering chart. The most logical use it
could have, because of its position and fingerings, is to increase the range of the instrument above e". It could conceivably strengthen the f"\textsuperscript{25} and possibly increase the range even to f\#" and or g".

The key for G is present. There are rollers between the G and Bb keys indicating that this instrument was made after 1885. Just below the C\# trill key on the butt joint there is an extra post that has no present use. Baines makes the comment when discussing the mechanism of the French bassoon that many bassoonists disassemble the alternate F key in the back of the butt.\textsuperscript{26} This is obviously what has occurred in this case. Also there are two tiny pinholes to each side of the thumb hole at the back of the butt. This indicates the presence at one time of a pad covering this hole.

The keys, posts and pads are of the same form as are presently used when constructing an instrument. There are metal bands on the inside of the tenons of the joints, and cork is used to fit the joints together. In some cases string has been added. The wing is lined with ebonite.

The instrument has obviously had much use as wear shows on the fingerholes and pads.

The instrument was donated to the museum by a Mrs. Othilie Riborg, of Lyngby, a suburb of Copenhagen, on March 3, 1970. A note on the catalog card indicates that Mr. Reboirg purchased the instrument in Paris in 1924 for Danish orchestra use. It does not say if the instrument was new at that time, but by the style of the keys it could very well have been.
Two outstanding examples of the experiments carried on in France were observed in the Paris Museum.

The bassoon made by Lecomte of metal (C 328) was made available for observation. In addition to the remarks made about this instrument earlier in the chapter some other remarks can be made at this time.

The instrument possesses the normal seventeen keys and French mechanism. It is made in two pieces. The only place where it comes apart is where the bell is attached. It might be noted that it is attached with the same type of mechanism that is used on a modern saxophone.

There are three oblique tubes for the left fingers, three for the right and also one for the right thumb.

The posts, pins and pads are all of contemporary shape and style. In his notes Mr. Waterhouse dates the instrument as 1889, but Pierre states that Lecomte made his metal bassoon in 1851.\(^{27}\)

A Triebert-Marzoli Boehm system bassoon (C3119 C510) was also available for study. The instrument is made of dark wood and keys and rings are made of silver. The pads are round and cupped.

There are no finger holes on the instrument. All notes are produced by means of keys. All of the keys are oblique mechanism (i.e., they do not directly open or close a pad, but rather go directly to a rod which carries the movement to the pad). There are 32 total keys. It would appear that the instrument is more complicated than the regular French bassoon by the sheer number of
keys. It should be noted that the rods mentioned earlier in the chapter did indeed run long distances. The longest is two thirds the length of the entire instrument.

The instrument is in the normal four pieces. However, the bell joint is only three inches long and the long joint is considerably longer than normal to compensate for this.

Heckel

There are only five instruments in the Heckel collection that are pertinent to this chapter. This is a very small proportion of their museum as it contains some 60 bassoons. This is an understandable situation however, when one considers that Heckel is the leading German maker.

Of these five, three were "regular" French bassoons, one was a combination of French and German styles, and the last was the Haseneir-Boehm instrument referred to earlier in the chapter.

Number P/24 is the first example of a regular French bassoon. It was made by Buffet in Paris. The instrument was maple and the keys were interestingly enough made of brass even though the museum dates the instrument 1860. It possesses the seventeen keys and two additional ones. The alternate crook key mechanism for the left thumb is present, but the mechanism is united to the a' and c'' keys. The crook key for the left little finger in the front of the instrument has been lost.

There is a key for R3 and the ring mechanism for the right hand B is used with the corresponding pad. Rollers are used between F and Ab.
This instrument possesses a locking system for the binding together of the wing and long joints. The keys are of contemporary shape and are supported by rods and pillars. Needle pins are used in conjunction with the older style of spring.

The shape and design of the instrument is identical with Copenhagen 1970-2. The ferrules have a bead around the circumference in the middle as did the other instrument, the bell shape is identical and the wing shape (very "blockish" and jutting abruptly from the regular part of the bore) is the same. Although the instrument in Copenhagen possesses more keys, this is an indication that the shape that Buffet uses on their bassoons has not changed from 1860.

The second example from the Heckel Catalog (F31) was made by C. Mahillon in Brussels. It possesses fifteen of the normal seventeen keys, lacking only the eb key and the e" key on the front of the wing joint. In addition there is a cupped key plate for G. The alternate octave key mechanism is present. There are rollers between F and Ab.

The bell is of similar style to the Buffet instruments, but the wing joint is shaped slightly differently. Instead of having a rather square shape, the wing is more rounded, similar to a German style instrument. However, the wing is very long extending down towards the butt joint much farther than is necessary.

The instrument is made of rosewood and the keys of silver. The butt has a removable cap and the bores are joined with a U tube.

The notation is made that the instrument is in very good condition.
The third instrument is made by Boosey and Company in London (F42A). The burn stamp indicates the address as 95 Regent Street. The serial number of the instrument is 16 665.

The instrument has sixteen keys, missing only the e" key from the basic seventeen. There are no rings present for either hand, and the alternate octave key is not used. There are rollers between F and Ab, however. The pads are cup shaped and the keys are supported by rods and pillars.

In addition to a locking mechanism between the long and wing joints there is also a lock on the front of the wing joint for locking the wing joint to the butt joint.

The wing is shaped very similarly to the previous instrument. Although the instrument is very definitely a French style instrument, the Heckel catalog gives it the description of being a French-English instrument. This is no doubt to give credit to the English maker.

The fourth instrument under consideration is by K. F. Adler of Bamberg. It is a curious combination of the French and German styles.

The keys on the back of the instrument worked with the left thumb are not of French style. Keys present in the German style are: B'; Eb'; C; D; a' and c". In addition there is a c# just below the a' key and a French style Eb. The keys worked with the right thumb are C#, F# and a plate for the E hole, which has an interlocking mechanism with the D key. This would close the E pad whenever the D key was depressed.

Keys worked with the right front fingers are: F; Ab; and
Bb. In addition plates cover the fingerholes. For the left front fingers the keys are: a half-hole plate for R1; a pad for the D hole (R2); a key for C (this key opens a hole around the side and down the wing joint); an Eb key in the French style; and a C# key in the German style. There is also another C# key--giving a total of three.

It is indicated that this instrument is made in 1850. It would seem that this is a very workable combination of the two fingering systems although of German basic style and of normal measurement (wing joint 483 mm, butt joint 415 mm, long joint 525 mm, and the bell 295 mm). The instrument is 1235 mm tall.

The last instrument under consideration in this chapter is a H. G. Haseneir instrument. It is 1179 mm tall (wing joint 558 mm, butt joint 318 mm, long joint 66 mm, and bell 201 mm). Langwill indicates that this would make this instrument almost a semitone above modern pitch.26

The instrument, although called a Boehm system bassoon, used most keys and fingerings in the German style. The keys for the left thumb are: Eb'; B'; C' and D. Eb is positioned in the back in French style. The keys for the right thumb include: F#, a thumb plate for E, and an Ab key.

For the right front fingers there are pads for the finger holes, a key for F and another Ab key. This is the first example of an instrument with the alternate Ab mechanism used on German bassoons.

For the left fingers there are also pads instead of finger holes, a c# key in the French style and a C# key in the German style.
The eb pad is larger than the other pads and the notation has been made in the catalog that it is a replacement.

There are no keys for Bb or eb. These notes are instead played with the first finger of each hand (Bb fingered R1 and eb fingered L1). B is then played R2 and e is played L2. This instrument is called a Boehm system instrument because it has keys with rods to note holes, rather than directly covering them with the fingers.
FOOTNOTES - CHAPTER 4

2Ibid., p. 52.
5Ibid., p. 60.
6Stockholm, p. 44.
7Carse, p. 55.
9Langwill, p. 62.
10Ibid., p. 60.
11Ibid., p. 62.
12Ibid., p. 61.
14Baines, p. 158.
16Langwill, p. 63.
17Ibid.
19Langwill, p. 64.

Pierre, p. 312.


Ibid., p. 65.

Heckel-Biebrich, Music History Museum Catalog (Biebrich: Heckel, 1968), number F 19.

There is a fingering given by Baines in Woodwind Instruments and Their History, for f" without this key, p. 157.


Langwill, The Bassoon and Contrabassoon, p. 63.

Ibid., p. 66.
CHAPTER 5

THE BASSOON IN GERMANY

DRESDEN

In contrast to the many individuals who contributed to the improvement of the bassoon in France, the influential makers in Germany were few. Grenser, Grundmann, Almanraeder and Heckel were the names of the most prominent. Their changes were many and in some cases very major ones.

At the close of the eighteenth century the makers of the Dresdner fagot were prominent. K. A. Grenser (1720-1807), J. H. Grenser (1764-1813), and J. F. Grundmann (1727-1800) were the names associated with the Dresden bassoon. Their instruments were known for their beautiful tone and were exceptionally well made.

These makers began adding keys to facilitate fingerings, and as mentioned in the previous chapter, the a' and c'' keys were often the first to be fitted after the first four primary keys. The Dresdeners continued to use the front Eb on the long joint (I4) and often added a c# key on the front of the wing joint before adding the F# key on the back of the butt. The F# had an efficient forked fingering and the key was not as necessary as the c#. An example of an instrument with eight keys was observed in Stockholm and will be discussed later in the chapter.
These instruments were really at their best when used for accompaniment purposes and in the keys of F, Bb, C and G major and in g and c minor. When keys were used other than these, or the instrument was required to perform a solo line, the defects in the instrument became much more apparent. In order to keep the instrument in pace with the advances that were occurring with the clarinet, flute and oboe, changes were obviously necessary. The addition of keys did not seem to help the basic problems of the instrument, so it was therefore decided that the body of the instrument was at fault.

ALMANRAEDER

Carl Almanraeder, a bassoonist and court musician for the Duke of Nassau in Biebrich and Weisbaden, decided to attempt to remedy the defects of the bassoon. He was aided with the advice of Gottfried Weber, a theorist, writer and acoustician. He made radical changes in the instrument and did indeed develop an improved instrument.

In 1820 a treatise was published by Almanraeder describing a fifteen keyed bassoon. The first of his bassoons were produced by B. Schott Söhne of Mayence. His improvements were many and important.

A considerable problem with the bassoon of the time was that the A was insecure and out of tune. Almanraeder located the problem as being the placement of the G hole. It was too close to the A hole for accurate sound production. However, moving it would put it completely out of the reach of the right third finger.
He solved the problem by placing an open key over a newly positioned hole. Further, to equalize the octave, he placed not only one G hole but two, on adjacent spots on both bores of the butt. In addition he used a lever mechanism that would be depressed with the right third finger and also automatically close when the key for F was depressed.

The next addition was the placement of a closed Bb key for the right third finger. The corresponding hole for this key was now, because of the lowering of the G hole, in a logical position between the A and G holes. It had previously been placed below the G hole.

He placed an open Bb' key covering a B' hole in the bell joint. The Bb' and B' keys were played with the left thumb, and placed in approximately the position that is presently used. This tone hole provided the additional benefit of improving the intonation of the extension tones from C to F. He covered the C hole with a pad, which made it more easily closed. This pad also simultaneously closed the D key. In addition, the B'natural key closed the C and D keys. This facilitated sluring of these low notes, and also enabled the left thumb to work more easily.

A closed key for C# was added to the front of the long joint (L4). This note (along with the B' natural) was previously unavailable. He continued to use the short closed key for Eb which was also played with L4.

Although he credited Grenser of Dresden with the invention of the c# key on the front of the wing joint, he also pointed out
in his treatise that, because of the placement of the hole, it filled with water. He moved the hole to the back of the wing joint and placed the corresponding key just below the a' key. Almanraeder's placement of this hole had the negative effect of producing a note that was not clear. To remedy this he reduced the length of the butt and lengthened the long joint and the wing correspondingly.

On the back of the butt he added a closed key. When depressed, along with the already present F# key and the fingering for G, it gave a true Ab. This enabled the player to slur between F# and G# which had not been previously possible.

He discarded the older, flat leather pads, which were not air tight and replaced them with the type of pad that a clarinet maker Iwan Müller had introduced for his twelve keyed clarinet. The pads were filled with wool and shaped like coat buttons. They were placed in cup-like keys and attached with sealing wax.

By 1828 Almanraeder had made further improvements in his bassoon. He added an extra, or alternate, key for F# on the front of the butt. This was positioned in such a way that it was on top of the end of the key for F and could be depressed by merely extending the little finger when playing F.

He moved the C hole further towards the bell of the bassoon. In order to keep the fingers in a position for the working of the holes and keys in the front of the wing, he covered the hole with a pad and extended a key from the tone hole to the position where the hole had been previously. This repositioning and covering with a
pad of the C hole enabled the tone hole to be placed in the accurate position and larger size necessary for an acoustically sound note.

He also moved and enlarged the tone hole for Eb on the front of the long joint. This reversed the direction of the key (the key plate had previously been above the hole and it was now below the hole) and improved the quality of the note produced by it.

No example of an Almanraeder bassoon was observed by the author and there is no example of the modifications that Almanraeder had made by this time in the Heckel collection. It is logical therefore to turn to Carse who described an Almanraeder bassoon.

This instrument is . . . made of ringed maple, with both flat and curved brass keys mounted in saddles. The total length is just over 51 inches, or about an inch longer than contemporary French bassoons. The bore increases from about 9 millimetres at the narrowest point of the wing to about 18 millimetres at the lower end of the joint; the long-joint increases from about 25 millimetres to 34 millimetres at the bottom of the bell-joint. On the long joint, the note-holes for C, D and E flat are situated further towards the bell, and the note-hole for E is further towards the butt when compared with a contemporary French instrument. The three finger-holes on the wing are situated much as on the French bassoon, but the middle hole is distinctly larger, while the uppermost hole is smaller and less obliquely bored. The holes for the right first and second fingers are rather smaller, and pierce the tube at an angle which is less acute. The crook increases in diameter from just over 3 millimetres to just under 9 millimetres, and is pierced by a pin-hole, but there is not a provision for a crook-key. The top of the opening of the wing joint is lined with ivory to protect it against wear and consequent widening.6

HECKEL

In 1829 Almanraeder employed a young worker by the name of J. A. Heckel. Heckel and his family for three generations were to have more influence on the development of the instrument than
Almanraeder could have foreseen when he hired young Heckel.

Just two years later in 1831, Almanraeder and Heckel joined together to form a business producing bassoons. They made bassoons for Schott and used the burn-stamp: B. Schott fils Mayence.

Before Almanraeder died in 1843 the hole for Bb was further improved by moving it to the back of the butt. A mechanism through the division of the bores enabled the player to depress a key in the front as was used when the hole was on the front of the bassoon. A key was also provided on the back of the butt for an alternate fingering for Bb. This has since become the primary fingering for the note. The right thumb hole was moved and a plate to cover it was added.

Before 1850, Heckel discarded the brass saddles and began using the rod axles and pillars that were being used by other makers on bassoons and other instruments as well.7 Heckel also added the alternate key for c♯ by placing a closed key on the small bore of the butt above the B hole. This is played with the right forefinger. He also added a crook key.

Heckel and his son, Wilhelm, proceeded to make further improvements on the bassoon. Basic changes were made in the shape of the bore and the cone was evened out and enlarged when necessary. J. Heckel argued that other tone holes on the front of the butt should be moved downwards as the G hole was. At the same time that he moved these tone holes, he enlarged the bore evenly to the bottom of the butt to further complete the change.
At nearly the same time they again moved the G hole to an
even lower position and added a single large pad in place of the
double headed pad that was in previous use. He also added the
mechanism through the butt that closes the F key when the F# key
is depressed, enabling the player to perform a F#/G# trill.

A ring was fitted to the left third finger hole which
raises when the third finger is lifted and the c# key depressed
on the back of the wing. This gives an alternate fingering for
eb (which was and still is primarily played as a forked fingering).
It also occurred to him that b' and c" would speak more easily if
this pad (c#) would open when c" key is depressed. These mechanisms
were all arrived at around 1870. 8

Heckel began using the U tube instead of the previous
system of the cork fillers. The cork was understandably unsatis-
factory and attempts were made by almost all makers to improve upon
this. The Heckel-Almanraeder bassoon was fitted with a sliding U
tube of brass. Later a plate, packed with cork and held in place
with screws, was used in addition to the U tube.

In 1889 Heckel patented a lining of the wing and narrow bore
of the butt joint of ebonite. A previous patent in England had
been issued to an Alfred Morton in 1875. 9 This lining was added
to prevent the deterioration of the inside of the wing joint and
small bore of the butt that was the result of moisture.

In 1901 10 the G hole was again moved, this time to the back
of the butt. To retain the same position for the key a mechanism
was bored through the division between the two bores, similar to
the Bb and F# mechanisms.
A year later he added a small closed hole for $g'$ which is operated with a ring on the right second hole.\textsuperscript{11} This mechanism is attached through levers so that when the fourth little finger is depressed on the F key, without the second finger closing the second hole, the ring rises and opens the $g'$ hole.

It wasn't until 1905\textsuperscript{12} that the present system for the vent-hole in the crook was introduced. Various devices had been tried before that date, but none had been entirely successful. This device is a combination of levers and keys which together close a pad at the crook. A key was added below the c$\#$ key and a lever connecting a long rod to the pad. This also connects to a duplicate mechanism which is connected from a lever and rod from the E pad on the butt, thus enabling the lowest tones to be played easily, without having to keep the thumb on the actual crook key and freeing it to depress the keys for the lowest four tones.

Although the vent hole on the crook gives an advantage on the upper notes, (above d') it is smaller than on French bassoons and somewhat less effective.\textsuperscript{13} The notes, from c' down to a, are apt to sound for a split second in the lower octave because of this hole. Making this hole slightly larger to prevent this, only has the effect of making these notes unsteady and windy. As a result the bassoonist must compensate for the problem by utilizing the thumb on the a' or c'' keys--whichever gives the truest note. This is done by merely flicking the key open for the split second necessary to give the note an adequate venting.

Additional keys are fitted that have not been previously mentioned. An e/f$\#$ trill key is fitted for the right second finger,
and also an optional d" key above the c" key. Also optional is an Ab/Bb trill key on the butt, and a mechanism that will hold down the F key when the E key is depressed, \( ^{1/4} \) enabling a trill on low E/F#. Most frequently a lock is added to the vent key mechanism to free the left thumb.

Composers have on occasion written the low A' for the bassoon, Wagner and Mahler in particular. In order to produce this note an extension must be provided for the bell joint or a special bassoon ordered. These are made upon request by the Heckel Company.

Wilhelm Heckel died in 1914 and upon his death the firm was headed by his son-in-law Franz Groffy. He is now also assisted by his son-in-law Adolf Gebhard and his daughter Edith. Adolph Gebhard was kind enough to show the author and her husband through the Heckel factory in 1965.

The firm retains the name Heckel and the tradition that goes with the name. The instruments continue to carry the burn stamp

HECKEL
BIEBRICH

with a crown on each side of the lettering.

Franz Groffy has remarked that:

The Heckel firm has a tradition of 135 years. All possessors were continually engaged to improve the bassoons and other woodwinds without thinking at first of profit and without regard to costs. Therefore, we are still ever in the eyes of business makers always a small undertaking. The advantage we have over other instrument makers is that we understand the scientific as well as the practical method. All other manufacturers understand that if they have the acoustical equation, they could build a conical bored woodwind instrument.
Success, however is only possible for such people who
know well about 150 influences and possess besides this
135 years of practical material.\textsuperscript{15}

One instrument was reported to have been produced in the
Heckel factory that was not stamped with the traditional Heckel
mark.\textsuperscript{16} Professor W. Roy Houser, of Indiana University in Bloom-
ington, Indiana, ordered a very special instrument and worked very
closely with Franz Groffy in its production. Some 45 additions
to the basic instrument were ordered including 18 karat gold for
the bell ring and sterling silver keys.

Two bocals were also of 14 karat gold. . . with a
new manufactured bore that resulted in a nomenclature
of VCD, which denotes an extreme hard and thin metal
with a bore that acts to regulate the pitch in the
extreme high register to the flat side, and also gives
a darker sound than normally expected from the typical
CC Heckel bocal.\textsuperscript{17}

This instrument received the stamp of the signature Franz
Groffy.

\textbf{LONG AND SHORT BORE BASSOONS}

Until the mid-twenties a longer instrument was produced by
the Heckel firm than those they make at present. The two types
of bassoon were discussed in an article by Alan Fox, vice president
and general manager of the Fox Bassoon Company, in the Instrumenta-
list.\textsuperscript{18}

The short bore instrument is about an inch shorter than the
previous long bore model. Fox describes the characteristics of
the long bore model by stating;

Its primary characteristics are a very even scale,
in pitch and tone, octaves that play in tune with the
fundamentals and with relatively firm pitch throughout the lower and middle registers. The sound is somewhat darker than that of its counterpart and it is pitched two or three vibrations per second lower. Depending on the reed employed (and to some degree, bocals), it can be tuned from a-437 to a-442.¹⁹

He goes on to say that the instrument has higher resistance, less response, and less penetrating power than the newer model.

The short bore instrument has been produced by Heckel exclusively since the series beginning 6000 and is the design of every commercially built bassoon that has used Heckel as a pattern instrument. It is built for response, resonance and projection at the sacrifice of pitch in the low register, i.e. E to B♭¹. The f♯, g, and G♯ are characteristically sharp, but the middle and upper registers can be played from a-440 to a-446.

He further describes the short bore instrument:

The tone of the short bore bassoon is brighter than that of the other and with proper bore design (or help from the player's reed) the sound carries an edge, which penetrates the largest concert halls. In addition, the tone holes are larger in diameter and placed farther down the bore. This results in a bigger, more powerful and more efficient sound (with the same blowing effort) than can be achieved with the long bore instrument.

The larger tones holes produce more flexible pitch than the long bore instrument and the short bore advocates generally prefer this, pointing out that it is easier to match the pitch of other instruments in the orchestra and also to give expression to the instrument itself. Critics of this bassoon dislike the bright sound, the uneven scale, and the sharpness of the low register. They contend that the difference in penetration can be eliminated by leaving a heavy edge on the reeds of the long bore instrument, a practice which brings heavy pitch and tonal penalties when tried on the short bore bassoon.²⁰

He states that from a manufacturer's standpoint, the short bore instrument is more difficult to control. In production, the
bore dominates the tone holes and a few thousandths of an inch variation in the critical points of the bore can result in wide deviation in the pitch and resistance. On the long bore instrument most of the tone holes dominate the bore. The bore's deviations show up as differences in resistance and tone, rather than pitch. He concludes by saying that, "the end result is that the long bore bassoons generally have fewer headaches, and the well designed short bore bassoons generally have more versatility."²¹

MEASURING THE BORE OF THE WING JOINTS

As mentioned in the article by Mr. Fox, short bore instruments are more difficult to produce accurately, and minute variations in the diameter of the bore can greatly effect the sound of the instrument. Don Cristlieb has done a study on the results of variations in the bore of bassoons. He presented the results of his study to the California Music Educators Association prior to publishing them in the Inter-American Music Bulletin in November, 1967.²²

Mr. Cristlieb begins his article by stating:

My first point emphasized that one does not expect to find a double reed instrument of superb quality in quantity anywhere, least of all in a public school. Most of those in use would discourage a professional, let alone a beginner. The frustrating fact is that they are inconsistent in scale, tone, and resistance. The bassoonist has indeed inherited more than his share of problems with an imperfect instrument, reed and crook, so it is not likely that the concealed and mysterious "bore" of his instrument will appear to him as a factor he can know something about, much less do something about.²³
He states that the figures he found when the results of measurements were available were consistent with the performance qualities. A rather perfect conicalness was indicated in the better wing joints. A difference of one or two thousandth of an inch did not prove to be critical, but differences of four, five, six or even seven thousandths mean different playing characteristics, and particularly so when the differences run consecutively over a length of several inches or more.

In terms of measurement, for example, the bore at the crook shoulder of the wing joint is over one-third of an inch, specifically three hundred and fifty thousandth of an inch. A typically good bore will increase in measurement, graduating consistently, fourteen and four-tenths thousandths per inch throughout the nineteen inches of the bore to where the final opening measures six hundred and twenty thousandths.  

He suggests that manufacturers should reexamine bore measurements to produce a better quality of instrument. He also suggests that suppliers should produce wing joints as replacements for the "multitude of ailing bassoons throughout the country."  

DESCRIPTION OF INSTRUMENTS

Stockholm

Six instruments from the Stockholm museum are pertinent to this chapter. The first instrument under consideration in the Stockholm museum is an instrument with the signature, A. Grenser, Dresden, 1797 (museum No. 1966/67-61). This instrument is particularly interesting because it is the only instrument that the author observed that had wooden keys. The instrument itself is of maple and the keys are of wood of a lighter color, possibly pear. There
are eight keys in all (Bb', D, F, Ab, Eb, c#, a' and c"). The c# key was placed slightly below the third finger hole on the front of the wing, but the c# hole itself was placed very close to where the wing joins the butt.

There is no F# key. As was mentioned when discussing the Dresden bassoon, the F# key was often left off because of the forked fingering that was available for the note.

The bottom is sealed with cork and the joints are wrapped with string. Wooden saddles are used on the long joint and brass saddles elsewhere. The key mechanism is tight and works very well, but is noisy. The pads are of leather. They are thick on the large size holes and paper thin on the small ones.

The bell is of similar shape as described on the Denner instruments, but without the molding. The interior of the bell shape conforms to the exterior appearance. This would give the desired effect of "chocking" the lower tones. There is, in addition, a resonance or venting hole approximately half way up the bell joint.

The crook seemed to be original. There is a seam on one side of the crook, which produces a ridge on the curve-top. The vent hole is present.

The second instrument of the period in the collection (No. 40 1899) has the burn stamp W. Schiele. It has nine keys (Bb', D, F#, F, Ab, Eb, c#, a' and c"). The pads are oval and keys are rounded. The c# key is in the position suggested by Almanraeder.

The shape of the bell is the same as the previous instrument. Notable about this instrument is a butt cap held by two pegs, and the presence of a neck strap holder.
A ten keyed instrument (no. 2250-1944) by "F. Ludwig, Prague" does not have the same type bell, but rather has a rather straight cylinder with only a very slight flare. It possesses the keys Bb', D, C# (on the back of the butt), F#, Ab, F, Bb, Eb, a' and c". The C hole on the back of the long joint was lined with ivory.

A good example of a twelve keyed Dresden bassoon (2462-1954) was also available for study. The keys present are Bb', D (with guard), F#, F, Ab, Eb, C# (played with L4 and the rod positioned to be out of the way of the player), C# (on the back of the long joint), a' and c". In addition a key serving as a vent key was placed above the c" key. The key opens a very small hole near the point at which the crook enters the wing. There is also a pad over the C hole.

The bell joint was of the same style as the other Dresden bassoons discussed and the burn stamp indicated that the instrument was made by Finke and Wisener of Dresden.

Another Weisner instrument was studied (932). This one also has twelve keys, with some changes. It possesses keys for Bb', D, F#, Ab, F, Bb (key on the front of the butt, which opened a hole on the side of the butt), Eb, C# (for L4, but opening a hole on the rear of the wing joint), C#, a' and c". The keys are all of brass and mounted on brass saddles. The pads are also of the newer oval shape and the keys themselves are slightly rounded.

The final instrument under consideration in the Stockholm museum (1954/55-26) has fifteen keys. The keys are of brass and are held with brass saddles. The ferrules are also of the same brass.
The instrument has keys for Bb', B', D, F#, Ab (on back of butt) c# (on back of butt), Ab (on front of butt), F, Bb, c# (on bottom of front of wing joint), eb, and Eb. In addition it had the a' and c" keys on the back of the wing and the vent key as described in 2462-1954. No pad is present for C.

The only round key is the Bb key, the others are rectangular. Possibly the Bb was added after the instrument was completed. There was at one time a resonance hole in the bell, but it had been filled.

A butt cap is used and held on by two metal screws.

Copenhagen

Three instruments pertinent to this chapter were studied in the Copenhagen Museum. It is most fortunate that two of these instruments were later examples of Finke and Weisner than those observed in Stockholm. This gave the author a later view of the instruments made in Dresden and also gave some measure for comparisons with the Almanraeder "innovations."

The first instrument is a twelve keyed instrument by Finke (E250). The museum dates this instrument as being made in 1820. The instrument again is of maple and the keys are brass. However, the pads are of the newer oval shape and the keys are held with pegs and screws rather than saddles. The C# key on the front of the long joint is attached differently. It is placed into the wood of the joint (no wood saddle or hump) and held in place with a pin through the wood.
The keys on the instrument are the Bb', D, F#, Ab (back of butt), Ab (front of butt), F, Bb, c# (right fore finger placed above the first finger hole on the butt), Eb, C#, a' and c". These keys are all in the "normal" position except for the deviation in the c# key as noted.

A metal cap is screwed on the butt and the left thumb hole is lined with ivory. The original bocal is present, but it has no vent hole. There is however, a resonance hole in the bell.

A twelve keyed instrument by Weisner (E252) was observed. The keys are of brass, but have a silver coating. The pads are oval and flat. The keys on the back of the long joint are placed on a wooden hump. The keys on the entire instrument were held with primitive posts and screws. A curved pipe is used at the bottom of the butt joint and covered with a cap.

The instrument has keys for Bb, D, Ab (back of butt), F#, Ab (front of butt), F, Bb, c#, Eb, C#, a' and c". The Eb pad was to the side of the butt, but the key itself was in the normal position. The c# key was also in the normal position (on the front of the wing), but the hole was to the rear of the joint. There are rollers between the F and Ab keys on the front of the butt.

It is interesting to note this instrument and the preceding ones by the makers of Dresden carried many of the "innovations" credited later to Almanraeder.

The last instrument in the collection pertinent to this chapter (E251) was a seventeen keyed instrument by C. Kruspe of
Erfurt. The burn stamp is a butterfly or moth with the initials C and K on the wings. In addition the instrument has the serial number LG 13 stamped on the metal band on the bell.

The instrument is of maple and the keys of brass, although the keys were held by posts, rods and needle pins rather than the older saddles. A metal U tube was used and the joints were string wound. Of special interest was the addition of a lyre holder on the front of the wing joint near the top.

The instrument possesses the Bb' key on the bell, and a corresponding B' key on the long joint. There is a pad on the C hole which is connected to the D key. There is also a key for the E hole. It is placed slightly above the position for the E hole which closes a pad over it. All of the butt mechanism on the back of the instrument is near the entrance of the wing joint, with long rods going to the positions for the holes. The duplicated Bb mechanism is used by the connecting rod bored through the butt. Also present on the back of the butt are the F# and Ab keys.

On the front of the butt is, as previously mentioned, the Bb key. In addition, the F and Ab keys are in their "normal" positions. Notable is the presence of the repositioned hole for G which is a double hole and pad just above the F pad. A key, in the position previously occupied by a G hole, is used to depress the double pad.

A C# key has been removed from the front of the butt joint and the corresponding hole on the side of the butt filled in. Also removed and filled in is an Eb key and hole on the wing joint, (between the second and third fingerholes).
A c# key in Almanraeder's position is used on the back of the wing joint and also the a' and c" keys. No vent mechanism for the crook is present.

Finally the C# and Eb keys are used on the front to the long joint. The keys are in the position that is considered normal today and the corresponding pads have been moved to the outside of the back of the long joint.

Nürnberg

The only example pertinent to this chapter in the Nürnberg museum was an instrument by W. Hess of Munich, which the museum dates as 1860. The burn stamp was in script

W. Hess
München

and had a large five pointed star beneath it.

Although the museum gives the date of the instrument as 1860 the instrument has only ten keys. These are made of brass and are held with the brass saddles. The saddles are more finely made than on older instruments. The older saddles merely fit on the outside of the key. These are fitted into the shape of the key itself. The key was cut to fit the saddles at the point at which the saddle came into contact with the key. The pads are oval and the keys are flat. The body of the instrument is very dark, and is possibly teak.

The instrument has keys for B♭', D, F♯, c# (older position on the back of the butt), A♭, (front of the butt), F, B♭, Eb, a' and c". Of particular interest about the keys on the back of the
wing is that the c" key overlaps on top of the a' key and when
depressed also depresses the a' key. This eliminates the necessity
to push down both keys at once for the extremely higher notes.

Because of the fact that by 1850 rod axles and posts were
in common use, the author would date this instrument much earlier
than 1860, perhaps even as early as 1820-30. None of the innova-
tions of Almanraeder were present, and the simplicity of the key
work should place it closer to the beginning of the century.

Heckel

The Heckel catalog contains many instruments that are of
particular interest. It is necessary, because of the number of
instruments (60), to choose those that have particular significance
in relating the physical development of the bassoon, or that contain
an example of unusual workmanship.

The first example (Fl0) carries the burn stamp, B. Schott
Fils a Mayence. The catalog indicates that this is an Almanraeder
instrument. It is a very early (1820-24) example of his work,
and uses only two of his innovations.

It has keys for Bb', D, F#, F, Ab, c#, a' and c". The c#
is placed on the back of the wing joint with the key below the a'
key. The C hole is covered with the pad that links to the D key.
The wood is maple and the keys are brass. The bottom is filled
with cork.

The bell is of a shape similar to the instruments of the
makers of Dresden (almost cylindrical, with a slight narrowing,
then an enlargement).
Number F 10A also carries the burn stamp B. Schott Fils A. Mayence. However, the burn stamp on the previous instrument had two circles filled with a flower above and below the name, and this stamp includes only one circle above the name with four lines cutting the circle into eighths.

This instrument was produced in 1831 and is the only example in the catalog of the Heckel-Almanraeder instruments produced at that time.

Present are the B♭ key with the hole in the bell, and the B♯ key interconnecting with the C pad and D key.

The F♯ and Ab keys are placed side by side on the back of the butt. On the front the G hole has been moved and covered with the double pad. The lever mechanism described previously which interlocks with the F key is also present. The B♭ key is angular with the hole in the new position. The alternate F♯ key above the F key is used. The Ab key is placed to the side of the F key.

The a♭ and c'' keys are present on the back of the wing. Also on the back of the wing is the c♯ key in the Almanraeder positioning. The Eb key is on the long joint just below the third hole on the wing joint. However, the corresponding hole is on the back of the long joint to the side of the D key. The C♯ key mechanism lies below the Eb key in a similar position to present bassoons and the hole is on the front of the long joint approximately two-thirds the way to the bell joint.

The curved slide mechanism is used for the butt joint and covered with a cap.
A third instrument to be considered is F/13A made by F. Rank of Rottenburg in 1830. The instrument is unusual in that it possesses a tuning "rack" mechanism on the wing joint. The top of the wing joint fits over a extension of the lower part of the wing joint and is moved to the position desired and held in place by means of a screw into a clamp.

The bell joint has a very large flare to it and is smaller than usual. It possesses the Eb' hole far up the back of the long joint and the bell is probably shortened to avoid the lever mechanism necessary when that hole is placed on the bell of the instrument. The B' key at the curves over the B' key to enable the player to close the Eb', B', C, and D keys with one key. An Eb key, in the French positioning, lies to the side of the D key.

On the back of the butt there is a C# key and corresponding hole. There is an extension from the wing joint which connects this pad to a key in the positioning of Almanraeder's C# (Note: there is only one hole for C#, on the back of the butt). F# is placed below the E hole.

On the front of the butt are the common F, Ab, and Bb keys with no modifications. The wing joint has the a' and c" keys, as well as the key for the C# on the butt as previously noted.

On the front of the long joint there are the German Eb and a C#. The C# mechanism lies above the Eb key, the opposite of the previous instrument. The butt bores are connected with a U-tube slide mechanism.
The pads of the instrument are different in that they are round and held to the key with rivets. The notation is made that the instrument is *sehr originell*.

An instrument by Schaufler of Stuttgart (F/18-1838) is included in the Heckel collection. The body of the instrument is made of maple and the keys are made of silver. The pads are flat and round. The long joint on the back of the instrument has the keys for Eb', B', C and D. The back of the butt has keys for c#, F# and Ab. The F# and Ab keys are interesting because the Ab key overlaps the F# key, and the F# key closes the F key on the front of the butt joint. This is achieved with a mechanism which goes through the butt of the instrument.

On the back of the wing joint the a' and c# keys are present. A key just below the a' key opens a small opening near the point at which the crook enters the wing joint.

On the front of the butt joint are the keys for F, Ab, and Bb. In addition there is a key for G and the corresponding pad lies to the side of the front of the butt. An Eb and C# key are used on the front of the long joint.

The bell is exceptionally long (390 mm. compared to a "normal" of about 300 mm.).

Of particular interest in this instrument is the placement of holes and keys on the front of the wing joint. The d and e holes are in a normal position but the c hole is placed much farther down the side of the wing. This placement of the hole necessitates a long angular key. A c# key is placed below the c key. The pad
for that note is placed to the bottom and side of the wing joint. An Eb key is placed between the C key and the D hole. There is also an F# trill key. This is the earliest example of this key to be observed by the author.

The next instrument of interest is an instrument by Haseneir (F/22). This instrument is contrastingly different from the model he made that was discussed in the previous chapter (F/21). This is a German type bassoon and does not have any of the Boehm characteristics that he used on the other instrument.

On the back of the long joint are the keys for B♭, B', C' and D'. On the back of the wing are the a', c" and c♯ keys. The last is in the position given it by Almanraeder.

On the back of the butt is an interesting arrangement of keys. There is a pad covering the E hole and a key is placed somewhat above it that depresses the pad. To the side of the E key is an F♯ key which, in the process of arriving near the E key, winds around the pad for the E. The Ab key winds around the F♯ key to reach somewhat the same area. It must be noted that these keys lie along side one another and do not cross. The winding is merely to bring them within reach of the E key. Also on the back of the butt is the pad for B♭. There is no key on the back of the butt for B♭ and the note is played with a key on the front of the butt in the position between the second tone hole and the G key.

On the front of the butt is the B♭ key already mentioned, a G key (with a double pad farther on down the joint), a F key, Ab key and F♯ key. There is also the c♯ key which is played with the right forefinger.
There are no keys present on the front of the wing and the Eb and C♯ keys are in the front of the long joint.

The next example (F26) is an 1863 product of Heckel. The keys on the back of the wing and long joint are the same as described in the previous instrument with the exception of the movement upwards of the C hole, which necessitates a key. The mechanism on the back of the butt is similar, but with the addition of a key above the E key for the Bb.

The mechanism on the front of the butt and wing is also the same as the previous instrument. Although the keys are mounted on posts and needle pins are used, the long hump on the back of the long joint is still present. The presence of the characteristic ivory ring is noted for the first time.

The next example is also a Heckel (F27) and is the oldest Heckel instrument in the collection. The instrument was made in 1850, thirteen years prior to the instrument just described. Although this instrument was produced earlier, there is no long hump on the back of the long joint and the C♯ key for the right forefinger is used. The rest of the keys and their placement are exactly the same as the other instrument.

The next instrument is considerably different than the Heckels of 1850 and 1863. Made by Meyer of Hannover (F28A) in 1860, it is a much more primitive instrument in some ways than either of the previous two. There is no pad over the C hole and no pad over the E hole. The B♭', B', D, and Eb' (French style) keys are on the back of the long joint. The back of the butt
has a simple F# key and also a c# key. The front of the butt is also simple having only a F, Ab, and Bb keys. There is no mechanism through the butt joint.

There is an Eb key on the front of the long joint in the early German style and a C# key is placed just above it. The eb key is used on the front of the wing. Present also is the f# trill key.

Of notable interest on the back of the wing joint is not only the c# key in the Almanraeder position, but a crook key mechanism which interlocks with the a' and c" keys.

The last instrument from the Heckel collection to be considered (F30) is also the newest Heckel instrument in the collection. It is dated 1877.

It is made of maple and has keys of silver. The keys and posts are more refined and there are rollers between the F and Ab keys. Although the key mechanism is exactly the same as on the two previous Heckels, with the exception of the presence of the mechanism that holds the F key down where the F# key on the back is depressed, the keys, pads, rods and posts are of considerably newer style and appear to be very similar to those in present use.

Sacramento

For final consideration the author's own Heckel bassoon (Heckel Serial Number 6618) is an example of a Heckel bassoon of the twentieth century. Although it was made sometime during the 1930's the instrument possesses the keys and mechanism common to most modern bassoons. In fact, bassoons of this style have served
as the model for manufacturers of bassoons in the United States and other countries as well.

On the back of the long joint the keys, pads and rods are placed in exactly the same positions as the previous Heckel instruments.

On the back of the butt, the E hole is now placed where the key for the older instruments were placed and covered with a pad. The Bb mechanism lies just above this pad and the F# and Ab keys lie just below it. The F# key holds down the F key on the front of the butt.

Present on the front of the butt are the F, F#, Ab, Bb and c# keys. There is also a key for G which closes a hole on the bottom of the back of the butt. A ring mechanism is provided on the second hole for the c' hole and pad which lie just between the B and A holes. The channels in the butt are connected with the U tube and plate.

The ring on the c' hole is present that allows the c# key to open when the high c'' key is depressed. There is also an f# trill key.

On the back of the wing are the a', c'' and c# keys. The only example of the present system for the venting of the crook key is on this instrument. The mechanism works just as described earlier in the text of this chapter.


3Nicholas Bessarsboff, Ancient European Musical Instruments (Boston: Harvard University Press, 1941), p. 131.

4Langwill, p. 49.


7Langwill, p. 54.

8Ibid.

9Grove, p. 491.

10Langwill, p. 54.

11Ibid.

12Ibid.

13Baines, p. 162.

14Ibid., p. 328.


16Ibid.

17Ibid.


19Ibid.
20bid.

21bid.


23bid., p. 1.

24bid., p. 3.

CHAPTER 6

SUMMARY

The earliest references to the twin-bored, conical instrument, that was to be known as the bassoon in future years, came near 1550. It had been thought that the instrument was invented by an Italian Canon, Afranio in the year 1539. However, recent studies have shown that Afrano's instrument and the earliest bassoons were too different to have been the same instrument.

The instrument was known variously as the curtal, dulzian, fagot and bassoon depending upon the country of origin and particular style of instrument. It was made of a single block of wood and the twin bores were cut from it. Entire consorts of fagots were developed, but the instrument known as the choirst-fagot is the particular instrument that became the bassoon. The other members of the consort were not developed further and were discontinued from use. The bassoon subsequently had a parallel development with a lower pitched instrument, the contra bassoon, with which this paper does not deal.

The bass pomer is not a predecessor of the bassoon as has been stated in some histories of music. It was a parallel development and contemporary of the earliest bassoons.

Practorius and Mersenne are invaluable sources of information about the instruments of this early period. They describe the instruments that were common to their time and present the reader with a general summary of their use.
The smallest number of instruments were available to study from the early period of the bassoon's development. This is understandable, because of the span of some 400 years from that time to the present. However, some good examples of different types survive and those observed by the author, particularly in Vienna, give a good picture of these instruments.

The next stage in the development of the bassoon begins with its division into four parts. At this point the instrument was able to reach B♭ and had three keys. Most notes were available, even though there were only three keys, through the means of cross fingerings. However, some notes were not available (for example Ab) and it was through the desire to be able to play these notes and to reduce the number of cross fingerings that keys began to be developed.

With an increasing number of keys, the somewhat ineffective style of key and pad had to be improved. These improvements have taken place over the span of four hundred years and are the result of many instrument makers' work.

With the addition of the sixth key by the year 1785, national differences began to develop in France and Germany. The style of fingering and timbre of sound produced by the instruments of these countries differs considerably. The French and German makers of that time, and their concepts as to just exactly what a bassoon should be, are influencing performers of the bassoon to this date.
The French attempted to preserve the characteristic tone of the bassoon, even though it was uneven in different registers, they also added keys to extend the range of the instrument, provide alternate fingerings for difficult passages, and to fill in notes that were not previously available. Though the German reasons for adding keys were similar, their concept of tone was different. They attempted to smooth out the unevenness of the sound, and to enable the instrument to blend with other instruments rather than to emphasize the differences. The English tended to make their changes along the lines of the French and imported instruments from France to be used in their country.

Many individuals contributed to French bassoon modifications. It was fully developed by the mid-part of the nineteenth century and has not changed since that time.

The German style of bassoon, however, had only two really important developers, Carl Almanraeder and Jacob Heckel and his family. Almanraeder made drastic changes in the instrument to achieve the modifications in the instrument that he desired. Heckel continued to develop the instrument and in many cases to reduce the drastic changes made by Almanraeder.

Alterations have been made in the German bassoon within this century and changes will undoubtedly continue to be made as the technology of instrument production improves.

Other makers are making bassoons of the German style, but it is the Heckel family that continues to dominate the production of the bassoon, not necessarily by the number of the bassoons that
they produce, but with the superior quality of the instrument they make.

When this study was begun it was assumed that the oldest period of history of the instrument would be the most obscure. However, the number of writings available for study from and about these earlier periods were more abundant than writings concerning the last 150 years. A history of the bassoon has been written by Wilhelm Heckel, entitled Der Fagot. It is not available in English. A translation of this history would be a project to be considered.

Langwill's history, although available in English is written in such a way that it does not really present a chronological development of the bassoon. It has been the author's intent to write a history in such a manner that the chronological development of the instrument could be seen clearly. There are many inaccuracies and inconsistencies in the writings available to the author and attempts have been made to reconcile these. Even the Heckel catalog contains errors as to the dates of the construction of instruments.

The museums visited, along with the Heckel catalog, have given the author sufficient examples to understand the development of the bassoon. The only exception to this was the lack of an unaltered six keyed bassoon. The number of changes of keys and positions of tone holes on already constructed instruments was of particular interest to the author.

The modern French or German bassoon is then the end product of some 400 years of gradual changes. These changes have been made with the intention of making possible smooth and rapid playing and
accurate intonation. However, attempts at a fully rational mechanical perfection have always been confronted with the fact that preservation of the character of the tone sets a limit to such modifications.
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