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The Bassoons in Marin Mersenne's *Harmonie universelle* (1636)

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RECENT SCHOLARSHIP has shown that many woodwind instruments— notably the recorder, flute, oboe, and bassoon—underwent considerable remodelling during the middle decades of the seventeenth century.¹ The remodellings, moreover, have been shown to have taken place in and around Paris, specifically by a group of woodturners centering around Jean Hotteterre (d. ca. 1678).² In light of the changes that occurred in seventeenth-century woodwinds, the monumental *Harmonie universelle*³ of Marin Mersenne (1588–1648) assumes paramount significance, for after its publication there were few printed French sources describing woodwind instruments until 1700,⁴ when the instruments had already been remodelled. As a result, Mersenne traditionally has been considered one of the final exponents of the older instruments, and his descriptions of woodwinds have served as a point of departure, a source to which discussions of remodelled instruments may be compared. In the case of the shawm and recorder families, both of which are treated in *Harmonie universelle* in much the same way as they had been in the sixteenth and early seventeenth centuries, such an approach to the writings of Mersenne seems perfectly valid. The bassoons described by Mersenne, on the other hand, do not lend themselves so convincingly to such an approach.

This article will attempt to come to terms with the instruments that Mersenne calls *fagots* and *bassons*. In so doing, it will demonstrate that the instruments under Mersenne's scrutiny had already entered a period of transition between the older dulzian and the more modern baroque

1. See, for example, Anthony Baines, *Woodwind Instruments and Their History*, rev. ed. (New York: W. W. Norton, 1963), pp. 273–94.

2. *Ibid.*, pp. 275–77.

3. Marin Mersenne, *Harmonie universelle contenant la théorie et la pratique de la musique* (Paris, 1636), facsimile ed. by François Lesure, 3 vols. (Paris: Éditions du Centre national de la recherche scientifique, 1965). See also Marin Mersenne, *Harmonie universelle: The Books on Instruments*, trans. by Roger E. Chapman (The Hague: Martinus Nijhoff, 1957).

4. Charles Borjon's *Traité de la musette* (Lyons, 1672) is, perhaps, a notable exception. This work, however, was undertaken outside the mainstream of instrument-making activity in Paris.

bassoon. It is necessary at the outset to establish an early seventeenth-century standard bassoon against which we may judge the several types described by Mersenne.

In 1596 Lodovico Zacconi provided a range of *C* to *b♭* for an instrument that he calls the *Fagotto-chorista*.⁵ This instrument is not illustrated by Zacconi, but, inasmuch as its range and especially its name correspond to the *Chorist-Fagott* described by Michael Praetorius in 1619,⁶ we may assume it to be an early bassoon. Praetorius's *De organographia*, in conjunction with his diagrams in *Theatrum instrumentorum* (1620), gives us an accurate idea of the early seventeenth-century bassoon. He writes, "on the Chorist-Fagott, the lowest note is *C* [and] on the double bassoon, *FF*."⁷ Praetorius next describes two varieties of double bassoons: a *Quart-bass*, which descends to *GG*, and the *Quint-bass*, with *FF* as its lowest tone. He continues:

. . . and it is most useful when both these kinds [of double bassoons] are available in an ensemble, since semitones cannot be altered and produced with the holes as surely by means of keys as by means of the fingers.⁸

In plate 10 of his *Theatrum instrumentorum* Praetorius depicts a large consort of double-reed instruments.⁹ The Chorist-Fagott in this diagram is about three and one-half feet tall,¹⁰ having two keys (clearly indicated as being for the notes *E* and *F*) and eight other finger-holes. Both keys are protected by fontanelles, the *F*-key having a double wing to accommodate both left- and right-handed players. The Quart-bass, four feet in length, demonstrates the same key and finger-hole arrangement, but the keys on this instrument, of course, produce *C* and *BB♭*. Extant instruments of this period substantiate the descriptions by Praetorius. The Chorist-Fagott, the Quart-bass, and the Quint-bass may be seen as representative of the normal early seventeenth-century bassoon.

The confused, often contradictory description of the bassoon in Mersenne's *Harmonie universelle* suggests that the instrument was, indeed, in a

5. Lodovico Zacconi, *Prattica di musica*, [part 1] (Venice, 1596), book 4, p. 218.

6. Michael Praetorius, *Syntagma musicum*, vol. 2, *De organographia* (Wolffenbüttel, 1619), facsimile ed. by Wilibald Gurlitt (Kassel: Bärenreiter, 1968), chapter 9, p. 38.

7. Ibid. "Im ChoristFagott ist der unterste Clavis *C* im DoppelFagott *F*."

8. Ibid. ". . . und sehr bequem ist / wenn man in der Music beyderley dieser arten haben kan: denn die Semitonia können in den Löchern durch die Schlüssel nicht also füglich / als durch die Finger geendert and zu wege bracht werden."

9. Praetorius, *Syntagma musicum*. Modern reproductions of this plate are available in several sources, including Lyndesay G. Langwill, *The Bassoon and Contrabassoon* (London: Ernest Benn Ltd., 1965), plate 6.

10. The foot measurement used by Praetorius was slightly smaller than today's standard.

period of transition. Proposition 32 of book 5 of Mersenne's work deals with at least four double-reed bass instruments in some detail: the *basson*, the *fagot*, the *courtaut*, and the *cervelat*.

The information Mersenne provides for the *basson* and *fagot* appears to defy coherent ordering. His discussion of the *basson*, for example, seems to be convincingly concluded in a single paragraph, after which he directs the reader's attention to his diagram of the *cervelat*. In the middle of this new paragraph, however, he introduces information of a most significant nature concerning the *basson*. Such curious ordering of details in proposition 32 has resulted in errors in interpretation on the part of modern scholarship.¹¹ Mersenne's chapter on bassoons is further complicated by his careful distinction between the terms *basson* and *fagot*; the former is a contra instrument, not unlike Praetorius's Quart-bass, while the latter is analogous to the Chorist-Fagott. Few, if any, subsequent writers followed Mersenne's care in this matter, and throughout the seventeenth and eighteenth centuries the two terms were interchangeable.

Mersenne first treats the *fagot*. He writes:

I treat these species of basses because they can be joined in the concert of oboes, and are different from the preceding bass [i.e., the bass pommer] only in that they break into two parts to be able to be managed and carried more easily; that is why they are called fagots, because they resemble two pieces of wood which are bound and faggotted together.¹²

He next refers the reader to his diagram of the instrument (see fig. 1). One is immediately struck by a number of discrepancies between this instrument and the Chorist-Fagott described by Praetorius. There appears to be a distinct bell-joint. Moreover, the instrument has three keys, as opposed to the standard two-keyed bassoon of the early seventeenth century. Most startling of all, perhaps, are the twelve holes (including the ones closed by keys), an increase of two over Praetorius's bassoons. Our understanding of this unique instrument is complicated, in addition, by the rough and disproportionate nature of the diagram.

The explanations offered by Mersenne, fortunately, do offer some help. The purpose of one of the two extra note-holes is indicated: the twelfth is one "which is not stopped at all,"¹³ according to Mersenne. It is, in fact, a

11. Anthony Baines (*Woodwind Instruments*, p. 286), for example, suggests that Mersenne's *basson* (and not the *fagot*) descended to $BB\flat$, which indicates that Baines may have fallen prey to the confusing organization of information in proposition 32.

12. Mersenne, *Harmonie universelle*, trans. by Roger E. Chapman, p. 372.

13. *Ibid.*, p. 373.

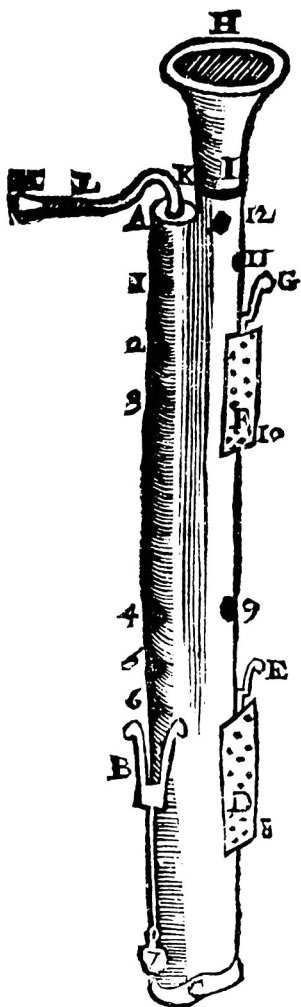


FIGURE 1. The *fagot*. From Marin Mersenne, *Harmonie universelle* (Paris, 1636), facsimile ed. by François Lesure (Paris: Éditions du Centre national de la recherche scientifique, 1965), vol. 3, p. 298.

tuning vent. Of the three keys, two are quite obviously analogous to the F- and E-keys of the Praetorius bassoon. Indeed, the first nine holes of Mersenne's instrument would appear to be identical in position and function to those of the Chorist-Fagott. To determine the function of the third key and the eleventh hole, we must look further into Mersenne's discussion. After describing other instruments included in his first diagram, Mersenne writes:

It must be added only that the bassons and the fagots have not all the same size, and that there are some that go lower than the others by a third or fourth. Some name this species of instrument *tarot*, but it is of very little importance what they are called, provided the manufacture and usage is understood, which consists of serving a bass in the concerts of musettes and voices, and in singing all sorts of music, according to its range which is of a tenth or an eleventh.¹⁴

The only difference between a normal fagot and a basson is apparently one of size. The ranges of Mersenne's bassoons seem to have decreased considerably from the two and one-half octaves of Praetorius's instruments. However, Mersenne must be referring to the natural range of the bassoon; as with other free-blown double reeds of the time, increasing the breath and adjusting the embouchure increased the range by at least an octave.

Mersenne begins his explanation of the basson by stating:

As to the basson, which is all of one piece of wood, it is easy to understand its construction and its parts from what we have said of the preceding fagots.¹⁵

We notice on Mersenne's diagram (see fig. 2) that the basson has four keys, the additional one operating the eleventh hole of the instrument. Mersenne explains:

This has four keys because it descends lower, and the same thumb that opens the key G opens similarly the key F, and the one that opens the ninth hole, which is behind the instrument, also opens the eighth by means of the key E.¹⁶

As mentioned above, we are subsequently introduced to the cervelat. But Mersenne interrupts this discussion:

But before speaking of the disposition of its [i.e., the cervelat's] holes and its range, the proportions of the preceding basson which descends a fourth lower than the ordinary ones must be explained.¹⁷

14. Ibid.

15. Ibid., p. 374.

16. Ibid.

17. Ibid.

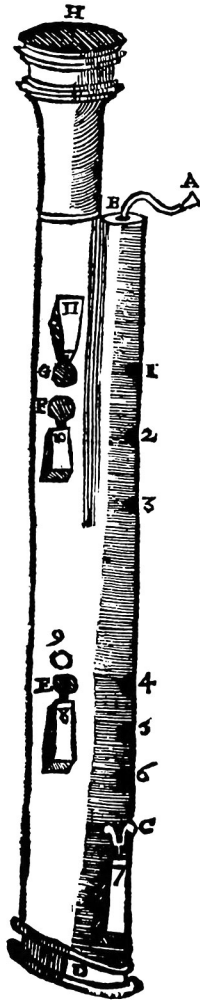


FIGURE 2. The *basson*. From Marin Mersenne, *Harmonie universelle* (Paris, 1636), facsimile ed. by François Lesure (Paris: Éditions du Centre national de la recherche scientifique, 1965), vol. 3, p. 300.

Mersenne finally makes it clear that his basson bears the same relationship to his fagot as the Quart-bass does to the Chorist-Fagott.

We may now attempt to define the function of the enigmatic eleventh hole of Mersenne's bassoons. Since in the case of the fagot, the first nine holes, including the first two keys, are apparently identical to those of the standard early seventeenth-century bassoon, it seems probable that the tenth, keyed hole produces the note *C*. Mersenne says that the basson has a keyed eleventh hole because "it descends lower."¹⁸ The eleventh hole on the fagot obviously performs the same function. It is likely, therefore, that the eleventh hole on Mersenne's fagot produces *BB♭*. The basson, in compliance with Mersenne's statement that it is a fourth lower than the normal bassoon, would consequently descend to *FF*. The hypothesis that the fagot has *BB♭* as a fundamental tone is all the more credible when one considers the normal use to which the instrument was put. It is suitable, Mersenne tells us, "for the large ensemble, such as the ballets."¹⁹ In these spectacles the bassoon normally doubled the bass line of the cellos.²⁰ Mersenne himself informs us that the cellos of the *Vingt-quatre violons du Roi* used an interesting tuning, having as their lowest note *BB♭*.²¹

Anthony Baines²² and Jürgen Eppelsheim²³ are among the few modern scholars who seem to have recognized that Mersenne's bassoon descends to *BB♭*.²⁴ The significance of this fact, and the implications of the other features of this instrument, however, have not been explored. Three items especially make the bassoon depicted by Mersenne a most significant one. The first is the downward extension of the instrument's range to *BB♭*, the lowest note of the baroque bassoon of the later seventeenth century. The second is not quite as obvious, but is an equally important development.

There are hints that Mersenne's fagot is already undergoing the process of sectionalization, a process that initiated the era of the modern woodwind. We recall that Mersenne writes, "they break into two parts to be able

18. Ibid. The cumbersome size of the basson, no doubt, accounts for the necessity of its additional key.

19. Ibid.

20. Richard Semmens, "Woodwind Treatment in the Early Ballets of Jean Baptiste Lully" (M.A. thesis, University of British Columbia, 1975), pp. 27–53.

21. Mersenne, *Harmonie universelle*, trans. by Roger E. Chapman, pp. 236–37.

22. Baines, *Woodwind Instruments*, p. 286.

23. Jürgen Eppelsheim, *Das Orchester in den Werken Jean Baptiste Lullys* (Tutzing: H. Schneider, 1961), p. 108.

24. As pointed out in n. 11, however, Baines assigns *BB♭* as the fundamental for the basson, rather than for the fagot.

to be managed and carried more easily; that is why they are called fagots."²⁵ If we compare this description to that of the basson, which Mersenne specifically notes "is all of one piece of wood,"²⁶ it seems likely that he was impressed with the fagot's two pieces. On the other hand, Mersenne's statement may simply indicate his fascination with the U-tube construction of the bassoon. Of more significance, perhaps, is the distinct bell joint that appears in the diagram of the fagot (fig. 1). The inaccurate illustration makes the bell look deceptively small; but Mersenne informs us, "this end is almost nine inches from I to H."²⁷ Describing the distances between the last holes of the instrument, he writes:

And from the eleventh to the twelfth seven and a half inches, and from there to the end of the fagot, which is hidden under the end HI, is five and a half inches.²⁸

How could the end of the instrument be "hidden" under the bell of the bassoon, unless the bell were a separate joint that was mounted onto it? It must be admitted that the extra length, HI, on the fagot could have no effect on the pitch of the instrument, owing to the twelfth, tuning hole²⁹; however, it would certainly have an acoustical effect on the tone of the bassoon. It seems probable that Mersenne's fagot represents one of the first tentative experiments in sectionalization to which most of the other woodwinds were to succumb by the end of the seventeenth century.

The final innovation on Mersenne's fagot is the third key, which we have suggested controlled the note *C*. The three-keyed bassoon became the standard variety of the late seventeenth and early eighteenth centuries. The later model, however, demonstrates a key mechanism somewhat different from that on Mersenne's fagot. The F-key of the later bassoon is similar to that of the fagot, being operated by the fourth finger of the lower hand. Instead of having the fagot's key for E and an open hole for D, both operated by the lower thumb, the later bassoon gave only an open E-hole to the lower thumb; the upper thumb, however, was given command of a new D-key, an open C-hole, and a new BB \flat -key. Thus the mechanism on the back of the fagot was completely reversed in the later seventeenth-century bassoon; what had on the fagot been operated by an open hole was now

25. Mersenne, *Harmonie universelle*, trans. by Roger E. Chapman, p. 372.

26. *Ibid.*, p. 374.

27. *Ibid.*, p. 373.

28. *Ibid.*

29. Mersenne says that the twelfth hole is twice as large in diameter as the other note-holes.

controlled by a key, and vice versa. If Mersenne's fagot does indeed represent an attempt at lowering the range of the bassoon to $BB\flat$, why was not the perfectly workable key system depicted by him maintained in the later seventeenth-century model? The answer, no doubt, lies in the process of sectionalization. The newer bassoon had four distinct sections: a tenor joint, a butt joint, a long joint, and a bell joint. On this newer instrument the E-hole was situated on the butt joint, while the D-hole was on the long joint. Had the key mechanism of the fagot been retained, the key that operates the note *E* on the fagot would have had to cross over the joint between the butt and long sections of the newer bassoon, in order to be in close proximity to the D-hole. Such an arrangement, of course, would be both impractical and susceptible to damage. In the later model, the two keys on the back of the bassoon were both contained on the long joint.

We may summarize the innovative features of Mersenne's fagot as follows: it descends to $BB\flat$; it seems to represent an early attempt at sectionalization; and it has three keys, adopting the important principle of putting the player's two thumbs in control of four note-holes on the back of the instrument. These features are all indigenous to the remodelled bassoon of the later seventeenth century.

The appearance of these innovations on the fagot of *Harmonie universelle* has a few significant implications. First of all, we may put back the period of the bassoon's remodelling. Adam Carse has suggested that neither the time nor the place of the appearance of the new bassoon "can be laid down . . . with any more accuracy than to conclude that it must have occurred after about 1640 and before about 1680."³⁰ We may conclude that the process of change probably occurred in France, and was certainly initiated before 1636. An even earlier date is suggested by the fact that most of *Harmonie universelle* was completed ten years before its date of publication.³¹ It is possible, then, that the period of transition in the case of the bassoon was commenced as early as ca. 1626.

A second conclusion we may base on the evidence of the fagot's innovations is that the bassoon was probably one of the first of the woodwinds to undergo extensive remodelling. Baines believes that the recorder was the first woodwind to submit to change.³² Insofar as the recorders described by Mersenne do not appear to be much different in structure from those de-

30. Adam Carse, *Musical Wind Instruments* (London: Macmillan and Co., 1939; reprint ed., New York: Da Capo Press, Inc., 1965), p. 186.

31. Baines, *Woodwind Instruments*, p. 238.

32. *Ibid.*

picted by Praetorius, it would seem that the bassoon anticipated the recorder's remodelling by at least a few years.

Finally, the features of Mersenne's fagot allow us to set up a tentative chronology in the process of remodelling the bassoon. Since the basson had an extended range to *FF*, but was nevertheless of "one piece of wood,"³³ we may suppose that the extension of the range down to *BB♭* on the fagot, along with the addition of a new key, was the first practical innovation. The process of sectionalization, although experimental on Mersenne's bassoon, was the next feature to appear. Full-fledged sectionalization, dividing the bassoon into four distinct parts, probably followed shortly thereafter. A fully sectionalized bassoon, as we have seen, necessitated a rearrangement of the key mechanism. The familiar baroque bassoon probably developed in these stages.

To understand the changes that occurred in the seventeenth-century bassoon, a comprehensive appreciation of the instrument that Mersenne calls the *fagot* is essential. We have seen that in the case of the bassoon, Mersenne should not be viewed as the last chronicler of an instrument that was soon after to fall into disuse. Rather, he should be seen as describing an instrument in transition from the older Chorist-Fagott to the more modern baroque bassoon.

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33. Mersenne, *Harmonie universelle*, trans. by Roger E. Chapman, p. 374.