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The Early Berlin Valve and an Unsigned Tuba at the Shrine to Music Museum

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ALMOST TEN YEARS AGO, while writing a book about valve instruments in Germany,[1] I found an interesting statement in an 1833 patent application by Wilhelm Wieprecht. It noted that Berlin valves (or, since the patent is not clearly formulated, perhaps only those of Wieprecht's own model) were almost twice the size of Berlin valves as we know them today. Although no examples of such large valves have survived, the Shrine to Music Museum (SMM) in Vermillion preserves an unsigned 1848 German tuba with unusually large valves (cat. no. 2902) (fig. 1). Another example, in the Musikinstrumenten-Museum in Markneukirchen, Germany, is a stylistically comparable, unsigned German trumpet with two rather large valves of the same type (cat. no. 72). These large valves obviously represent a continuation of an earlier stage of development of the Berlin valve; they combine the advantage of large size (smoother bend of the channels) with that of smaller valves (easier handling).

Contrary to the popular belief that the Berlin valve was invented by Wieprecht for his 1835 tuba, this valve type had previously existed in a slightly different form. In that same year the Technische Deputation, which reviewed Wieprecht and Johann Gottfried Moritz's patent application for the tuba, pointed out that this sort of valve had already been employed by Heinrich Stölzel and Friedrich Blühmel. The reference was to Stölzel's rejected 1827 patent application, which concentrated, among other things, on an improvement of Blühmel's box valve. Since the patent model submitted by Stölzel has not survived and since his written description is neither detailed nor accompanied by a drawing, we need to examine other sources, particularly an 1845 article by Wieprecht, to learn how Stölzel's version of the valve might have looked.

1. Herbert Heyde, *Das Ventilblasinstrument: Seine Entwicklung im deutschen Sprachraum von den Anfängen bis zur Gegenwart* (Leipzig: VEB Deutscher Verlag für Musik, 1987; Wiesbaden: Breitkopf & Härtel, 1987).

FIGURE 1. Tuba in F. Unsigned. The Shrine to Music Museum, no. 2902. Photo courtesy of the Museum.

In his application of 1833, Wieprecht stated that he had started to improve Berlin valves in 1828, i.e., one year after Stölzel's invention.[2] That was also the year when Blühmel introduced his three-channel rotary valve, the circular windway of which fascinated Wieprecht and made him pronounce it the perfect windway for valves.[3] Because the rotary valve, which was also very large, operated slowly, Wieprecht decided to transfer its circular windway to Stölzel's Berlin valve. Not until 1832 did Joseph Kail in Prague reduce the rotary valve by half its size; this idea again fascinated Wieprecht, as we may gather from the article which he wrote in 1845.[4] Imitating Kail, Wieprecht also reduced the size of his valve and, considering this model the best in existence, applied for a patent. However, it was refused on the grounds that he had utilized only previously known ideas. Nevertheless, this valve did become highly successful and is generally known in Germany as the *Berliner Pumpen.*

Among the extant German instruments with Berlin valves, we find, besides the Wieprecht version, which is well documented by the tuba patent of 1835, another windway in two varieties which we can assume to be forms designed by Stölzel. Wieprecht again provided confirmation of this in his previously mentioned article; he noted that Adolphe Sax in Paris followed both the model of Stölzel and that of Wieprecht himself.[5] Since we are well acquainted with Sax's version of the Berlin valve, we can conclusively identify the valves of the SMM tuba as based on Stölzel's model. Another clue is provided by the only surviving Berlin-valve instrument by Griesling & Schlott, the company which made Stölzel's models; this instrument, a trumpet, is furnished with the same valve type.[6] Finally, this same model is frequently found in Prussian cornets made during the nineteenth century, before the adoption of rotary valves.

2. See Heyde, *Ventilblasinstrument,* 23–24.

3. For documentation of Blühmel's three-channel rotary valve (1814–28), with a photo and drawing of the item in the Musikinstrumenten-Museum, Markneukirchen, see Heyde, *Ventilblasinstrument,* 27–29, 113.

4. Wilhelm Wieprecht, "Der Instrumentenmacher Sax in Paris als Erfinder" (Berlin, 1845); repr. in A. Kalkbrenner, ed., *Wilhelm Wieprecht: Sein Leben und Wirken* (Berlin, 1882), 90.

5. See Wieprecht, "Instrumentenmacher Sax," 92: "Die Ventile sind die von mir construirten Stecherbüchsen, . . . und die Anlage der Ventilbogen ist nach Art der frühern Stölzel'schen Röhren-Schiebeventile eingerichtet."

6. This trumpet is in the Muzeum Narodowego in Poznań, Poland. For a photo, see Herbert Heyde, *Musikinstrumentenbau in Preußen* (Tutzing: Hans Schneider, 1994), 304.

These cornets—introduced into Prussian military music in 1832—must not be confused with other types of cornets. They probably were only improved versions of Stölzel's *Signalhorn* (1827).

As a result of these developments, we can differentiate between the Wieprecht and Stölzel models of the Berlin valve. Furthermore, we find indications that Stölzel started with Blühmel's box valve, since he admitted in his patent application of 1827 that his newly invented valve "may have some likeness to that submitted to the [patent] files by Blühmel."[7] In addition, Wieprecht in his article of 1845 called Stölzel's earliest versions *Schiebekastenventile* (box valves with a rectangular cross section).[8] But how they looked in detail remains an open question. They might have been in use for only a very short period of time, because about the years 1828 and 1829, versions with cylindrical casings, at first in large size, were introduced. Probably only after Wieprecht had devised the smaller form did the workshops manufacturing for Stölzel eventually follow suit. The valves of the SMM tuba might then be a late version of the large-scale Berlin valve.

Although more comfortable to handle, the small valve suffered due to difficulty in smoothly bending the channels. This was the point of departure for Sax, who in 1843 modified the Wieprecht and Stölzel models and achieved a smoother windway without enlarging the pistons. Like Blühmel and Wieprecht, Sax believed that the clue to musical perfection was the smoother bending of the channels—a view that reflects more an analogous conclusion than scientific reasoning. While the models of Stölzel and Wieprecht are based on windways crossing at right angles in the piston, Sax in his Wieprecht-based model arranged the channels in small, more easily played pistons at angles of 105 and 75 degrees. These angles are taken from an original alto saxhorn at the SMM (cat. no. 4878); this instrument was built in 1843, the first year when saxhorns

7. Geheimes Preußisches Staatsarchiv Berlin, Rep. 120 D, Abt. 14, Fach 2, no. 33: ". . .und ob es gleich Ehnliches mit den von Blümel zu den Acten gelegten haben mag, so ist es doch von jenen sehr verschieden." See also Heyde, *Ventilblasinstrument*, 22.

8. Information about the windway in the earliest stages of the development of the Berlin valve is extremely vague or even contradictory; notice, for example, Wieprecht's description: "Blühmel's rotary valves differed only in their outward appearance from Stölzel's first *Schiebekastenventilen* but were equal to them in their interior structure, and both form the basis of the invention." [Die conischen Büchsen Blühmel's waren nur äußerlich von den ersten Stölzel'schen Schiebekastenventilen verschieden, ihrer inneren Construction nach aber gleich und bildeten beide so das Fundament der Erfindung ("Instrumentenmacher Sax," 90)].

and the Sax piston were manufactured. The number of degrees results from a different division of the plate from which the piston is made. Instead of dividing the long plate of twenty-four Parisian *lignes* into four equal parts (as is required when designing a Berlin valve), Sax made the distances between the channels one *ligne* shorter or longer, respectively.[9]

In other factories, Sax pistons were manufactured with yet other degrees of angle, providing us with a criterion to use in attributing unsigned instruments to particular workshops. (This may also have been true later for Sax's workshop, but the theory still needs confirmation.) Sax modified in the aforementioned fashion not only the Wieprecht but also the Stölzel model; furthermore, he included these revisions in his very first saxhorns (first and third valves based on Wieprecht, the middle one on Stölzel, as shown in fig. 2). The versions built in England and the United States follow more or less closely the models of Sax, although sometimes they deviate in the entrance and exit from the main tube.

Returning once more to Wieprecht's article, published one year after Stölzel's death, one sees that Wieprecht deliberately obscured Stölzel's role in the development of the Berlin valve—almost relegating it to a vague early stage, while promoting his own version. Thus he gave the appearance of being the actual inventor of the Berlin valve. The message of his article eventually spread into the organological literature of our century and was accepted as fact.

To summarize the argument thus far, we can say that the basic idea for the Berlin valve stems from Stölzel's endeavors to improve the box valve in 1827. One year later Wieprecht further improved Stölzel's Berlin valve by adopting particular characteristics of the rotary-valve models by Blühmel (1828) and Kail (1832). Based on both Stölzel's and Wieprecht's models, Adolphe Sax in 1843 modified the windway in order to gain a still more smoothly bent channel.

* * *

As we know from biographies of Wieprecht and Moritz, both were on friendly terms, and we can deduce from the surviving Berlin-valve instruments that the Moritz workshop used the Wieprecht model whenever possible. The SMM tuba, which was made in a different workshop,

9. Twenty-four Parisian *lignes* equal two Parisian *pouces* (inches), or 54.1 mm.

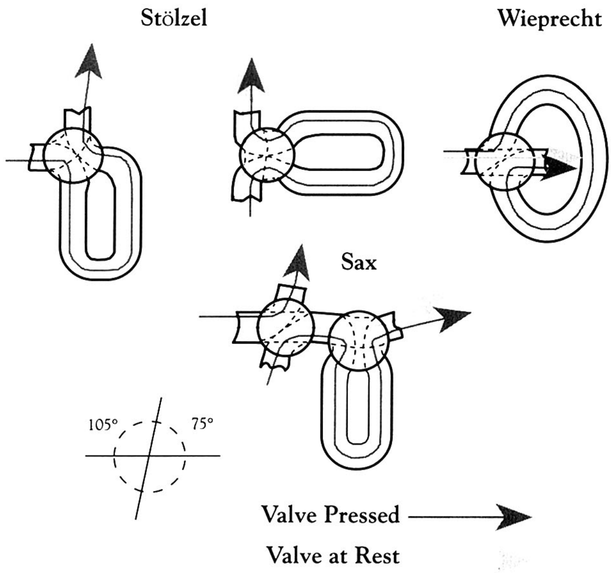


FIGURE 2. The main types of Berlin valves designed by Heinrich Stölzel (1827), Wilhelm Wieprecht (1828), and Adolphe Sax (1843).

bears an inscription saying that it was owned by the sharpshooter company in Lauban, Silesia (now Poland), in 1848 (*Scharf=Schützen Comp. in Lauban 1848*). We may assume that 1848 was its year of manufacture. Some evidence exists to suggest that by 1845 the patent protection of the Wieprecht-Moritz tuba came to an end. The tuba had experienced no further development in the Moritz factory, which during the period of patent protection annually manufactured about eight tubas, or a total of eighty-four between 1835 and 1845. Even outside Prussia, where the patent protection was not in force, modifications only of other types of valve basses (e.g., bombardons with Vienna valves) have been authenticated before 1845.

Among other extant examples (one in the possession of Robert D. Medley in West Bend, Wisconsin; another in the Regionalmuseum in Gotha, Germany; and two others in the Stadtmuseum in Cologne), the SMM tuba can be identified as one of the first tubas to progress decidedly beyond the Wieprecht-Moritz concept. In contrast, the tuba by J. H. Zetsche (Hanover, ca. 1850–55) in the Bate Collection in Oxford (cat. no. 663) still closely follows the Berlin patent tuba. Also in contrast to the

Wieprecht-Moritz tuba, the SMM instrument is furnished with both a tuning slide before the valve section and extendable valve slides. The tubing corresponds approximately to a model in a price list of about 1855 from the wholesaler C. G. Herold in Klingenthal, near Markneukirchen, in the Vogtland of Germany (fig. 3). However, in the configuration of the bore one can see only a slight departure from the patent tuba toward the bombardon (fig. 4).

A mixture of Berlin and Vogtland stylistic characteristics is evident. The Berlin features are inherited from the patent tuba and are rather common as late as the 1870s and beyond. They include the use of German silver for the garland and nameplate, long ferrules, incised decoration, and the use of an acorn motif in the engraving (fig. 5). Characteristics typical of Vogtland or Saxony are found in the shape of the stays and in a certain configuration of slashes on the bow guards, on the leadpipe ferrule, and in the engraving.

Using a unit of measure as a criterion by which to suggest where an instrument was designed, we find that the instrument's valves are suited to this method.[10] They were measured in accordance with the Berlin foot (equal to 309.7 mm) and were built from the inside to the outside, beginning with the discs (fig. 6). Another basic measure was the height of the piston, and the third is the distance between the lower and upper channels. All other measurements are derived from these three basic lengths. If we apply the Saxon foot (equal to 283.2 mm) to the tuba, the readings do not fit. Thus we can conclude that the tuba was probably designed in Berlin.

Examining all the available evidence, we are faced with conflicting local characteristics, some pointing to Berlin and some to the Vogtland. Which of these features provide the strongest evidence of geographical origin? Our answer must be: those which were not imitated beyond their area of origin. In the present case these are local characteristics of the Vogtland style. Although the style of the Berlin patent tuba came to be adopted by most tuba makers, Vogtland features are not found on ex-

10. The bell's diameter may be understood in Saxon *Zoll*, as well as Berlin *Zoll*. The tolerances of the pipe diameters are too large for them to be usable in tracing them to the original measurements. Incidentally, the ferrule lengths (53.1, 65.7, and 76.7 mm) follow approximately the lengths of two, two and one-half, and three Berlin *Zoll* (51.6, 64.5, and 77.4 mm).

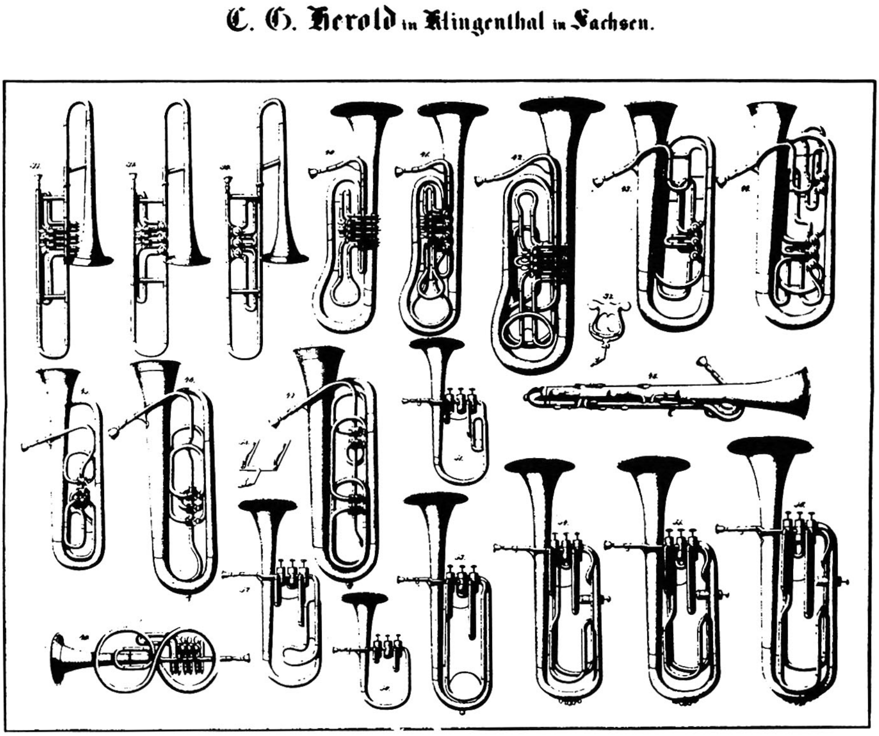


FIGURE 3. Price list of musical instruments of the wholesaler C. G. Herold, Klingenthal, ca. 1855. The Shrine to Music Museum no. 2902 corresponds in its basic concept to no. 43 (next to last tuba in the first row). In the second row, tubas with the Wieprecht-type valve; at the right side below the saxhorns, tubas with valves of the Sax type. Musikinstrumenten-Museum, Markneukirchen. Photo courtesy of the Museum.

tant tubas of contemporary Berlin workshops, i.e., those of C. W. Moritz and C. F. Zetsche. The observance of the Berlin unit of measure outside Berlin could be a result of blind copying or following a Berlin construction plan. Who in Berlin could have made both plan and design? Aside from the aforementioned two workshops, only J. Gabler flourished in Berlin in 1848 and shortly before, while Griesling & Schlott are listed in the city directory for the last time in 1846. About that year this company, which once built Stölzel models, closed; but it is logical to assume that the last proprietor capitalized on the workshop inventory of tools, plans, and

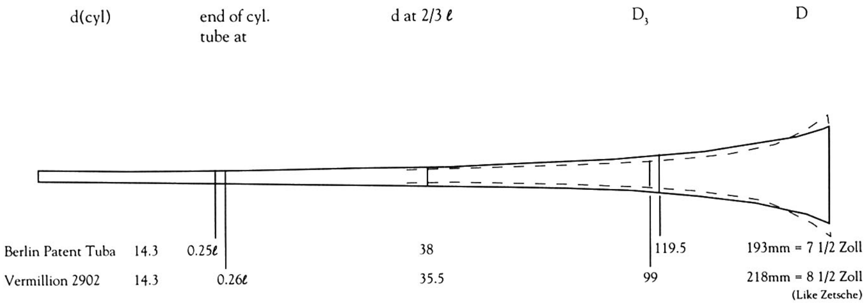


FIGURE 4. Tuba. The Shrine to Music Museum, no. 2902. The bore compared to that of the Berlin patent tuba, no. 4456, at the Musikinstrumenten-Museum, Staatliches Institut für Musikforschung Preußischer Kulturbesitz, Berlin.

models. These materials might have passed to C. G. Herold in Klingenthal, and Herold could then have furnished them to a local craftsman. During this time Markneukirchen saw a great surge in brass instrument making; between 1834 and 1871 the number of workshops making brass instruments soared from 49 to 249.[11] Most of the masters worked anonymously for wholesalers or distributors like F. Glier & Sohn or C. G. Herold.

The rather numerous extant, unsigned Vogtland instruments are often of mediocre, sometimes poor quality. But often they are of solid workmanship, as in the case of the tuba at the SMM; however, they are normally below the high standard of the Berlin workshops and factories. Thus we can attribute the tuba in question, with respect to its workmanship, to a Vogtland maker rather than to a maker in Berlin. It might soon be possible scientifically to corroborate the point of origin for this tuba if a database of the chemical composition of the brass once produced in Hegermühle (where the Berlin makers purchased their sheet

11. Louis Bein, *Die Industrie des Sächsischen Vogtlandes*, vol. 1: *Die Musikinstrumenten-Industrie* (Leipzig, 1884).

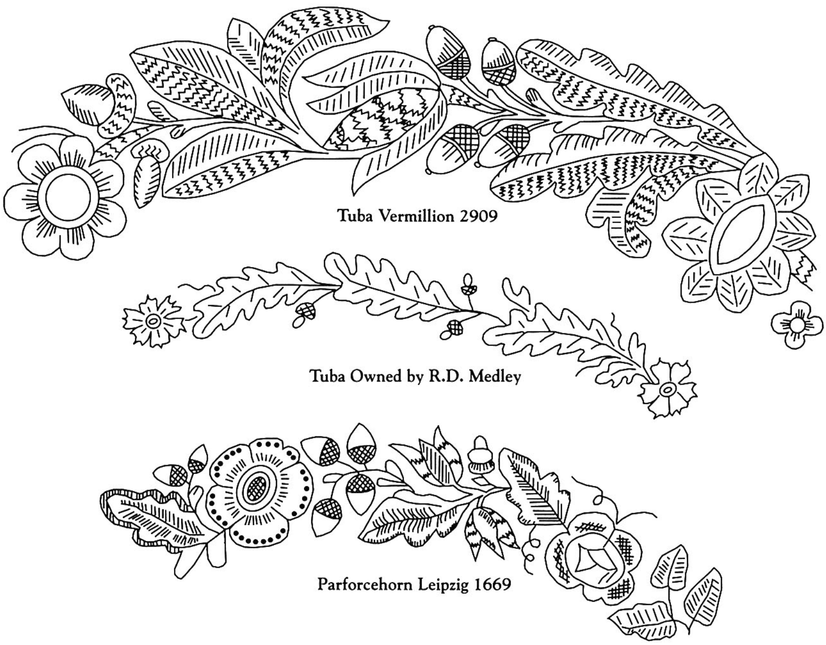
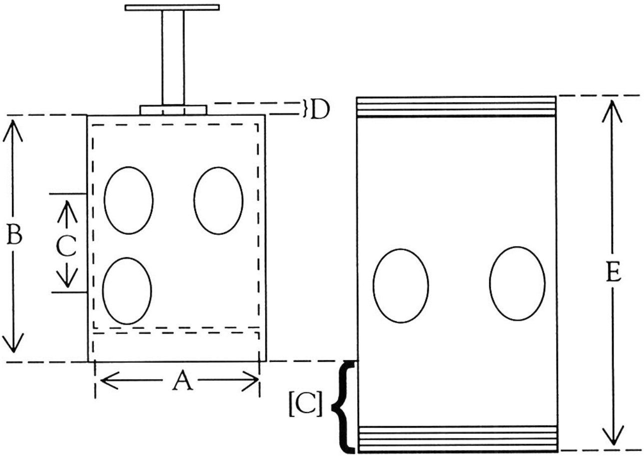


FIGURE 5. Garland engravings of the tuba, Shrine to Music Museum, no. 2902; tuba, ca. 1850, owned by Robert D. Medley, West Bend, Wisconsin; and Parforcehorn, no. 1669, at the Musikinstrumenten-Museum in Leipzig. All three instruments were probably made in the Vogtland of Germany.

brass) and Auerbach (where the Vogtland makers bought theirs) were to become available in Germany.[12]

In conclusion, one can say that the tuba at the Shrine to Music Museum utilizes early versions of the Stölzel-type of Berlin valve and that it was based on measurements of a Berlin design. However, its style and workmanship display characteristics of the Vogtland-based workshops, in one of which it was probably made.

12. Karl Hachenberg, "Brass in Central European Instrument Making from the 16th through the 18th Centuries," *Historic Brass Society Journal* 4 (1992): 229–52.



Rated Value			Actual Value
A = 1 1/3"	= 34.9 mm		34.7/ 34.9./ 35 mm
B = 2"	= 51.6 mm		51.4 / 51.8 / 52.1 mm
C = 3/4"	= 19.4 mm		19.5 / 19.5 / 19.5 mm
D = 1"'	= 2.15 mm		
E = B+C+D	= 2 5/6"	= 73.1 mm	73 / 73 / 74 mm
1" = 1 Berlin Zoll	= 25.8 mm		

FIGURE 6. Tuba. The Shrine to Music Museum, no. 2902. Valve construction.