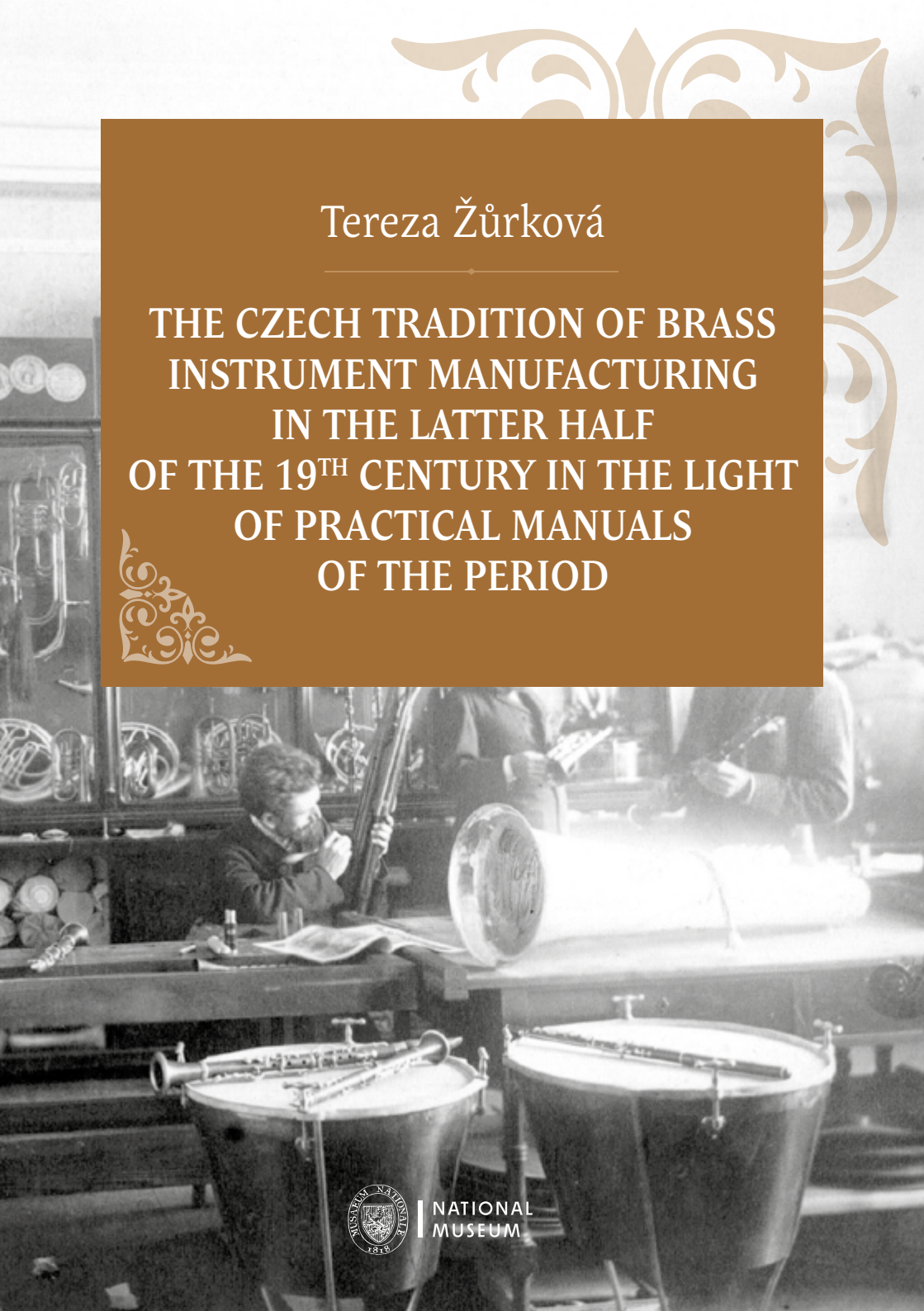
Tereza Žůrková

THE CZECH TRADITION OF BRASS INSTRUMENT MANUFACTURING IN THE LATTER HALF OF THE 19TH CENTURY IN THE LIGHT OF PRACTICAL MANUALS OF THE PERIOD



NATIONAL MUSEUM

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TABLE OF CONTENTS

FOREWORD

From 2012 until 2016, when I was working on my dissertation on the subject of brass instrument making in the Bohemian lands, I realised how little we know about the practical matters of instrument making operations in older historical periods. Preserved period instruments, however obvious their importance may seem, represent our main source of information documenting the development of the instrument making craft and the quality of the work of specific manufacturers, but we are only marginally and very generally informed about the practical side of things, whether this involves the organisation of the craft or especially its exact methods and methodologies. Nevertheless, knowledge about period technologies is increasingly seen as being of fundamental importance not only for understanding the development of instruments and of their manufacturing, but also as a precondition for the modern production of faithful copies of historical instruments that are to serve for the informed interpretation of music of older periods. As international research has shown in recent years, the topic of period instrument making processes is a key question, and answering it is essential if we want to achieve objectively complete knowledge of this tradition.

A book by Josef Šediva then struck me like a bolt from the blue. The Czech brass instrument manufacturer working in Odessa published a clearly organised and very detailed summary of his life's work. The detailed study of this unique material and of the circumstances of its creation led me to a further text on theory and practice by another important Czech manufacturer, Václav František Červený. In both cases, the studies turned out to be quite unique, not only for their focus and content, but also, in

particular, for the time when they were published. Although the two texts were written independently of each other, they have in common their authors' sincere desire for the advancement of their trade and the selflessness (something very rare in those days) with which they chose to share their hard-won experience with their readers. This characteristic is all the more admirable for having arisen at a time when craftsmanship was still largely being passed on by word of mouth and when a firm's competitiveness was ensured not only by its constant progress, but especially by its own (often secret) production processes guaranteeing the quality of the instruments being made.

In my research on other period materials and sources, I failed to discover any other equivalent texts from the period being examined. Because the publications in question have so far remained little known and less accessible to the broader public for various reasons (especially their language), I have decided to present them in this publication in an annotated translation, with introductory chapters placing them in the context of the time and milieu in which they were written. I hope that making them accessible will make a modest contribution towards shedding light on the question at hand.

ACKNOWLEDGMENTS

I would like to take this opportunity to express my thanks to all of my colleagues and friends, without whose participation the present monograph could not have been written. Whether they played a direct or indirect part in its creation, they are all deserving of my sincere thanks, and I would like to take this chance to express my respect for them and for the work that they do. Those

persons, listed in random order and omitting titles, are František Ibl, R. Dale Olson, Tomáš Slavický, Viktor Hruška, Sabine K. Klaus, Jaroslava Pospíšilová, Martina Vlčková, Lada Fialová, Jan Košek, Filip Šír, Daniela Kotašová, Franz Gratl, Dagmar Kalousová, Mark Newkirk, Jiří Knap, coleagues from the Czech Museum of Music. For their thought-provoking comments, consultation, and discussion, I also thank the scholarly editor Petr Kalina and both reviewers, Renato Meucci and Jaroslav Rouček.

I would like to express my special thanks to the director of the Czech Museum of Music, Emanuele Gadaleta, without whose selfless commitment this study could not have been written in such a friendly, collegial, and open atmosphere; his moral support never left me in doubt even for a moment that no work is of marginal importance if we devote the necessary effort to it.

It is with unconcealed respect that I also address my special appreciation to my esteemed colleague Vladimír Maňas, who guided me through my doctoral studies years ago, giving me his full trust even when I took steps that did not merit it, thereby teaching me that however much one may stumble, it is always possible to get back up and continue as long as one believes that the journey towards the goal is worthwhile. For that I am grateful to him, and through him also to my alma mater, Masaryk University.

I am dedicating this book to my family members, who mean everything to me.

INTRODUCTION

By their nature, musical instruments are very complex objects that embody a combination of both artistic (purely cultural, musical, aesthetic) and physical (structural, acoustical) properties. Monitoring or interpreting their development in various historical periods must therefore be set into a broader historical and especially cultural context (not only musical, but also aesthetic and philosophical) that had a fundamental influence on the shaping of the instrument making craft. Herbert Heyde has defined in detail the transformations of this paradigm directly in the context of broader historical developments.[1] Two processes in particular played a major part in shaping the period we are investigating here, i.e., the nineteenth century (specifically its latter half): in the longer-term context, the scientific revolution and the concomitant perception of the importance of acoustics for musical instrument making, and in the shorter term, but more significantly, the industrial revolution and gradual industrialisation. These processes, having emerged in the eighteenth century and culminating in the latter half of the nineteenth, revolutionised many aspects of human life (economics, politics, culture, society), and they naturally were reflected substantially in musical instrument manufacturing as well as in other sectors of the economy. This transformation had the greatest impact in the field of keyboard instrument manufacturing (including both chordophones and aerophones), but it also had a significant effect on other families of musical instruments, and brass instruments were no exception. Ignace de Keyser used four basic aspects to define the

[1] HEYDE, Herbert: Methods of Organology and Proportions in Brass Wind Instrument Making. *Historic Brass Society Journal*, Vol. 13, 2001, pp. 1–52.

impact of this comprehensive process on musical instrument manufacturing:[2]

1) technical (choice of material[3] and application of industrial procedures from fields other than musical instrument manufacturing[4]);

2) economic (division of labour,[5] mechanisation of manufacturing and mass production);

3) sociological (development of mass culture);

4) ideological (constant striving for progress).

The marked spread of military bands and the consequent demand for musical instruments for those ensembles resulted not only in the mass production of those instruments, but also in increased production of repertoire intended for those ensembles, and in turn, efforts towards developing the technical possibilities of the available instruments of the period. Logically, this was also

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[2] KEYSER, Ignace De: The Paradigm of Industrial Thinking in Brass Instrument Making during the Nineteenth Century. *Historic Brass Society Journal*, Vol. 15, 2003, pp. 233–258, here p. 233.

[3] In comparison with their colleagues in Western Europe, Czech brass instrument manufacturers did less experimentation with the use of new metals for making wind instruments (steel, aluminium – cf. KEYSER 2003, op. cit., p. 233) and remained faithful to brass and its alloys; the only new material that became commonly used was nickel silver (an alloy of copper, zinc, and nickel). This is confirmed not only by the preserved instruments, but also by secondary sources including a report from the Chamber of Commerce and Industry in Cheb (Handels- und Gewerbekammer Eger), which from 1864 regularly published information about the instrument manufacturing trade in the Kraslice (Graslitz) region in the form of statistical overviews of manufacturers, apprentices, the use of mechanical equipment, the production of individual types of instruments or their components, and the consumption of material. ŠLÉGROVÁ, Hana: *Výroba dechových hudebních nástrojů v Kraslicích*. Dissertation. Brno: Masarykova univerzita, 2001, p. 48ff.

[4] For making brass instruments, this involved in particular soldering, the use of steam-powered machines etc. On the other hand, even after factories were opened, most work was still done by hand rather than being mechanised; for example the Chamber of Commerce and Industry in Cheb hoped that continuing to have work done by hand at the factories in the region would help maintain a higher quality of products and a competitive advantage against the factories on the other side of the border in Saxony, so even by the end of the 19th century, only two of the eleven musical instrument factories in Kraslice had steam-powered machines at their disposal. FIALA, Jaroslav: Společenstva výrobců hudebních nástrojů na Kraslicku a Lubsku. *Hudební nástroje*, Vol. 27, 1990, No. 3, pp. 85–86, here p. 85.

[5] The division of labour was primarily connected with the emergence of valves and the making of more complicated instruments, with individual craftsmen specialising only in a particular manufacturing process.

associated with the use of valves for brass instruments and the resulting expanded number of the playable notes on the instruments of that family. Musical instrument manufacturers were influenced on the one hand by the need to satisfy the massive demand for brass instruments, but also on the other hand by the need to maintain competitiveness by making production of high quality or by making innovative instruments with better acoustical properties. It was through these new forms of brass instruments that manufacturers were competing on a large scale, as is primarily demonstrated by the industrial expositions of the period. In some cases, this involved nothing more than companies' advertising gimmicks that by their nature did not offer very innovative solutions, but a number of renowned instrument makers devoted themselves to this matter very comprehensively, and had it not been for their competitiveness, the diverse array of modern instruments could hardly have assumed the form that it can boast today. Although many new forms of brass instruments proved to be short-lived (in some cases, we can even say their technical designs were merely theoretical and did not lead to practical applications), it is certain that the production of these new forms contributed to the shaping of the industry and of the variety of available instruments to what was then an unprecedented degree. At the same time, instrument making was developing not only in connection with the invention of new kinds of instruments, but also as a consequence of the application of new materials, new possibilities for their processing, and new working methods.

Although for a long time only the geometry of the bore containing an instrument's vibrating column of air was seen as the fundamental formative element of the instrument's acoustical

properties,[6] recent research has shown[7] that neither the materials,[8] nor wall thicknesses, nor in particular the manufacturing processes can be regarded as marginal with respect to their influence over an instrument's resulting sound. It is therefore appropriate to subject the instruments in use during a concrete historical period to broad contextual research[9] and also to seek answers to questions about the materials used and in particular the exact procedure by which the instruments were being made during the period in question.[10] For periods farther back in history, in answering this question we are faced with a lack of direct

[6] One person who experimented with this idea was Adolphe Sax; in 1846 he made six brass instruments of the same overall length and the same straight shape but with differing bore geometry in order to demonstrate that the acoustic properties of brass instruments are determined solely by that factor, and not by their material or shape. Cf. KEYSER 2003, op. cit., pp. 245–246. Victor-Charles Mahillon did a similar experiment. Ibid. Also see HEYDE 2001, op. cit., pp. 1–2. Also cf. HEYDE, Herbert: *Musikinstrumentenbau. Kunst—Handwerk—Entwurf*. Leipzig: VEB Deutscher Verlag für Musik, 1986, p. 203.

[7] See in particular the university research project from the Hochschule der Künste Bern titled *Historisch informierter Blechblasinstrumentenbau*. See https://www.bfh.ch/de/forschung/forschungsprojekte/2010-949-797-342/. Cf. EGGER, Rainer: Rekonstruktion von historischen Blechblasinstrumenten. In: *Valve. Brass. Music. 200 Jahre Ventilblasinstrumente*. RESTLE, Conney – BRETERNITZ, Christian (eds.). Berlin: Nicolai, 2013, pp. 110–119.

[8] The aforementioned project from the university in Bern is an example of research devoted to the materials in use in the period. The project successfully defined the exact alloy used in France for making brass instruments, which is now used by the company Egger in Basel for making brass instruments intended for historically informed interpretation. Cf. SENN, Marianne – LEBER, Hans J. – TUCHSCHMID, Martin – RIZVIC, Naila: Blechblasinstrumentenbau in Frankreich im 19. Jahrhundert. Analysen von Legierung und Struktur des Messings zugunsten eines historisch informierten Instrumentenbaus. In: Allenbach, Daniel – von Steiger, Adrian – Skamletz, Martin (eds.): *Romantic Brass. Französische Hornpraxis und historisch informierter Blechblasinstrumentenbau*. Symposium 2. Musikforschung der Hochschule der Künste Bern: Vol. 6. Schliengen: Edition Argus, 2016, pp. 398–419. Also cf. STEIGER – SENN – TUCHSCHMID – LEBER – LEHMANN – MANNE 2013, op. cit.

[9] Cf. KEYSER 2003, op. cit.

[10] Moreover, these two questions are very closely interrelated because the quality of the material being used determined, among other things, the way it was processed—with alloys of lower quality, the methods for their processing had to be adapted to the materials' properties. This was, for example, the subject of a complaint made by Saxon brass instrument makers in 1788 about the poor properties of brass from Saxony (made in Rodewisch) compared with brass made in the Kraslice region, which was more suitable for metalworking and was, moreover, cheaper. HACHENBERG, Karl: Brass in Central European Instrument-Making from the 16th through the 18th Centuries. *Historic Brass Society Journal*, Vol. 4, 1992, pp. 229–252, here pp. 241–242.

sources, and findings can be deduced on the basis of surveying preserved specimens and other secondary sources.[11]

In the nineteenth century, the source base for research on the making of brass instruments is greatly expanded with the increase quantity of printed materials published by individual companies and the emergence of specialised periodicals and articles published in the period press, but this increased quantity of sources must be viewed cautiously because the increase is only apparent from an objective perspective. These period sources (especially the promotional materials, price lists, brochures, patents, and period press reports) where mostly a way for manufacturers to advertise their own new inventions. Advertising materials in particular must be taken with a grain of salt because their main purpose was to promote the company, and the information that they contain may be deliberately overstated or idealised. In the other types of sources (especially patents), manufacturers did state entirely concrete, exact information, but it tends to involve the dimensions or structural proportions of new instruments; the reader does not find much in them about the instrument making craft itself.

Direct sources that would inform us about period methods of brass instrument making are found only sporadically and are very rare.[12] In addition, period articles about technical matters of the industry tend to deal only with individual issues (e.g., various metalworking methods or aesthetic surface treatments) rather than the overall process of musical instrument making.[13] For this

[11] In spite of this, the questions of that early period have been dealt with very thoroughly—see HEIDE, Geert Jan Van der: Brass Instrument Metal Working Techniques: The Bronze Age to the Industrial Revolution. *Historic Brass Society Journal*, Vol. 3, 1991, pp. 122–150.

[12] STEIGER – SENN – TUCHSCHMID – LEBER – LEHMANN – MANNE 2013, op. cit.

[13] For example, the articles in the journal *Zeitschrift* für *Instrumentenbau* (founded in 1880), and especially the columns "Winke und Rezepte" and "Materialen, Bestandteile, Maschinen und verwandte Gegenstände".

reason, the practical manuals by two Czech brass instrument makers, Václav František Červený and Josef Šediva, can be classified as unique sources. They give us a real picture of the practices of period craftsmen because they describe in relative detail the entire manufacturing process, and in the case of Šediva's manual, even a summary of all dimensions for all models of the brass instruments he was making. In those days, such concrete information was very rare because for a long time the craft was being passed on for the most part only orally from the master to his apprentice. In many cases, masters kept the specific details of production to themselves, and young journeymen had to learn those details through their own practice.[14] From the two sources in question, we get not only a direct source of information about the technology of brass instrument making in the latter half of the nineteenth century, but also, especially in the case of Šediva's manual, a source documenting how that craft was thought about at the time and what its mission and priorities were. It is, in fact, a bit surprising that these two valuable sources remained unnoticed for a relatively long time even in the Czech scholarly literature.

There was a lengthy period when the scholarly literature did not devote its attention to the question of the manufacturing of musical instruments in the Bohemian lands. The first organological studies written in the Czech language were devoted primarily to the taxonomy of musical instruments and their historical

[14] Naturally, this involved all fields of the instrument making trade, and not just the making of brass instruments. In the Czech milieu, this is well documented, for example, in the correspondence between the luthier Věnceslav Metelka and his son Václav. Václav went to various workshops for training, and in his letters to his father, he often claimed that the master instrument makers did not wish to reveal the exact measurements of their instruments or the special skills of their craft to their journeymen, so the journeymen acquired this information secretly if they had the opportunity, or they even paid to receive it. Cf. ŽŮRKOVÁ, Tereza: Houslařské řemeslo v 19. století ve světle písemné pozůstalosti rodiny Metelků. *Opus musicum*, Vol. 47, 2015, No. 6, pp. 6–20.

development. The oldest research on Czech musical instrument making tended to be a part of more general historical research, then later a part of research on narrowly specialised topics directly only towards a particular group of musical instruments or a particular instrument maker. Comprehensive research on Czech musical instrument making was initially devoted to only two areas of musical instrument manufacturing—violin making and organ building; bellfounding also received a greater level of interest.

It was therefore not until the 1970s that the manufacturing of wind instruments in the Bohemian lands was discussed in greater depth by Jindřich Keller,[15] who as able to follow up on two older foreign studies: a treatise on the history of the French horn in the Bohemian lands[16] and an encyclopaedia of wind instrument manufacturers.[17] Keller's studies primarily concerning Czech territory were substantially supplemented by Pavel Kurfürst[18] with research on instrument makers working in Brno. Beginning in the 1980s, one can follow the relatively steady production of scholar-

[15] KELLER, Jindřich: Josef Šediva – zapomenutý český nástrojař. *Hudební nástroje*, Vol. 3, 1966, No. 5, pp. 142–146; KELLER, Jindřich: *Nátrubkové nástroje se strojivem v 19. století*. Diploma thesis. Praha: Univerzita Karlova, 1967; KELLER, Jindřich: Píšťělníci a trubaři. Pojednání o výrobě dechových hudebních nástrojů v Čechách před rokem 1800. In: *Sborník Národního muzea v Praze*, Řada A – Historie, Vol. 29, 1975, No. 4–5, pp. 161–244; KELLER, Jindřich: Strahovská sbírka hudebních nástrojů. In: *Sborník Národního muzea v Praze*, řada A – Historie, Vol. 146, 1977, No. 3–4, pp. 175–186; KELLER, Jindřich: Čeští hudební nástrojaři v Rusku. In: *Sborník Národního muzea v Praze*, řada A – Historie, Vol. 33, 1979, No. 1, pp. 1–68; FIALA, Jaroslav – KELLER, Jindřich – MATĚJČEK, Jiří: *Kraslice: město a hudba*. Kraslice: Amati, 1970; FIALA, Jaroslav – KELLER, Jindřich – MATĚJČEK, Jiří: Město Kraslice a hudba. Supplement: *Hudební nástroje*, Vol. 20, 1983, No. 5 a 6.

[16] FITZPATRICK, Horace: *The horn and horn-playing: and the Austro-Bohemian tradition from 1680–1830*. London: Oxford University Press, 1970 (the publication ties in with Fitzpatrick's earlier research; see FITZPATRICK, Horace: An Eighteenth Century School of Horn-Makers in Bohemia. *The Galpin Society Journal*, Vol. 17, 1964, pp. 77–88).

[17] LANGWILL, Lyndesay G.: *An Index Of Musical Wind Instrument Makers*. Edinburgh: L. G. Langwill, 1972. Much information about Czech manufacturers has been added in the expanded and revised edition of this publication in part on the basis of consultation with Jindřich Keller: WATERHAUSE, William: *The New Langwill Index. A Dictionary of Musical Wind-Instrument Makers and Inventors*. 1st ed. London: Tony Bingham, 1993.

[18] KURFÜRST, Pavel: *Brněnští hudební nástrojaři 14.–19. století*. Brno: Moravské muzeum, 1980; KURFÜRST, Pavel: Tradice brněnské výroby dechových nástrojů. *Časopis Moravského muzea, vědy společenské*, Vol. 66, 1981, pp. 237–241.

ly literature devoted to the manufacturing of brass instruments. In the vast majority of cases, however, this involves foreign publications,[19] where Czech makers are only marginally discussed, or studies with a broader range of topics from which one can gather much useful information, but in which the making of musical instruments is not a priority. For this reason, brass instrument manufacturing in the Bohemian lands has been dealt with in greater detail so far only for selected locations[20] or persons.[21] I devoted myself to a summary of existing knowledge and research about this field in my dissertation,[22] but even there, because of the large timespan involved, the topic was narrowed down to research on French horns. Moreover, all of the cited studies mainly concern

[19] Especially HEYDE, Herbert: *Trompeten, Posaunen, Tuben*. Leipzig: Deutscher Verlag für Musik, 1980; HEYDE, Herbert: *Hörner und Zinken*. Leipzig: Deutscher Verlag für Musik, 1982; HEYDE 1986, op. cit.; HEYDE, Herbert: *Das Ventilblasinstrument: seine Entwicklung im deutschsprachigen Raum von den Anfangen bis zur Gegenwart*. Leipzig: Deutscher Verlag für Musik, 1987; TREMMEL, Erich: *Blasinstrumentenbau im 19. Jahrhundert in Südbayern*. Collectanea Musicologica, Band 3. Augsburg: Wißner, 1993; WELLER, Enrico: *Blasinstrumentenbau im Vogtland von den Anfangen bis zum Beginn des 20. Jahrhunderts*. Markneukirchen: Geiger-Verlag, 2004.

[20] KELLER, Jindřich: *Hudební nástroje na Kraslicku* [manuscript], archive of the company DENAK Kraslice, undated; KAUERT, K.: *K historii výroby hudebních nástrojů v saském Vogtlandsku a českém pohraničí kolem Kraslic* [manuscript], archive of the company DENAK Kraslice, undated; FUCHS, Adolf: *Die Standorts Verlagerung der sudetendeutschen Kleinmusik-instrumenten-Industrie von Graslitz und Schönbach*. Dissertation, Erlangen 1952; FIALA, Jaroslav: K počátkům tovární výroby hudebních nástrojů (na Kraslicku a Lubsku). *Hudební nástroje*, Vol. 26, 1989, No. 3, pp. 86–87; FIALA 1990, op. cit.; FIALA, Jaroslav: *Západočeská vlastivěda: Hudba*. Plzeň: Západočeská univerzita, 1995; DULLAT, Günter: *Der Musikinstrumentenbau und die Musikfachschule in Graslitz von den Anfängen bis 1945*. Nauheim: G. Dullat, 1997; KORBEL, Václav: Historické a jiné pohledy (hudební nástroje na Kraslicku). *Hudební nástroje*, Vol. 34, 1997, No. 1, pp. 49–52; ŠLÉGROVÁ 2001, op. cit.

[21] Of brass instrument makers, this applies in particular to Václav František Červený. For a bibliographical overview, see PAVLÍK, Jiří: *Václav František Červený: doba, život, dílo*. Praha: Torst / Aula, 2006; SLAVICKÝ, Tomáš: The Innovations of Václav František Červený (1819–1896) and the Austrian-Czech Tradition of Making Chromatic Brass Instruments. *Musicalia*, vol. 11, 2019, No. 1–2, p. 46–70. Available from: https://publikace.nm.cz/en/periodicals/mjotcmom/11-1-2/the-innovations-of-vaclav-frantisek-cerveny-18191896-and-the-austrian-czech-tradition-of-making-chromatic-brass-instruments; KRATOCHVÍLOVÁ, Markéta – IBL, František: A French Horn by Václav František Červený from the Collection of Ondřej Horník. *Musicalia*, Vol. 3, 2011, No. 1–2, pp. 145–150. Available from: https://publikace.nm.cz/en/file/070a162cd0e780bfc3d561c7394bbf0e/24835/Musicalia_2011-71-77.pdf; PAVLÍK, Jiří: *Otakar Červený. Mecenáš československých legií v Rusku*. Červený Kostelec: Pavel Mervart, 2014.

[22] ŽŮRKOVÁ, Tereza: *Výroba nátrubkových dechových nástrojů v českých zemích v 18. a 19. století se zaměřením na lesní rohy*. Dissertation. Brno: Masarykova univerzita, 2016.

the historical development of instrument making and important persons, or they document specific instruments and instrument collections. They primarily deal with the topic of the instrument making trade itself with respect to its organisation and historical development rather than its production technology.[23] This is understandable because for answers to these questions, we lack enough direct sources, so knowledge can be acquired only by multidisciplinary research of preserved instruments and of other written and iconographical sources.

A recent project devoted to the matter in question in this manner has been conducted under the patronage of the Hochschule der Künste Bern with the title "Historisch informierter Blechblasinstrumentenbau".[24] The project's focus is on researching the making of brass instruments in nineteenth-century France, and its goals are to acquire knowledge about the materials and period technologies used for manufacturing, to make semi-finished products for historical instruments, and to further advance research leading to the historically informed manufacturing of musical instruments.[25] Towards the attaining of that goal, the team has selected three basic research methods, namely:

a) research on sources concerning historical techniques and traditions of the industry,

[23] This situation arises in other language areas as well, where there is also a lack of literature of this kind. Representing something of an exception are the books by Günter Dullat (*Metallblasinstrumentenbau: Entwicklungsstufen und Technologien*, Frankfurt am Main: Bochinsky 1989, or, more precisely, its second edition: Wilhelmshaven: Florian Noetzel, 2011) and by Karl Nödl (*Metallblasinstrumentenbau. Fach- und Lehrbuch über die Herstellung von Metallblasinstrumenten*, Frankfurt am Main: Verlag Das Musikinstrument, 1970), in which there is very detailed discussion of the technology for manufacturing brass instruments, including very accurate diagrams and proportions, but these texts refer to the modern making of brass instruments, and not to historical technological procedures.

[24] See https://www.bfh.ch/de/forschung/forschungsprojekte/2010-949-797-342/ and https://www.bfh.ch/.documents/ris/2010-949.797.342/BFHID-225956928-27/Blech-rz3.pdf.

[25] Collaborating on the project is the Swiss instrument manufacturer Egger, which makes instruments using the kinds of materials and technologies that were defined within the framework of this research.

b) precision material research using analytical methods (e.g., determining the exact composition of the alloys of historical brass instruments, the thickness of the sheet metal used, metallurgical research to determine the process of metal quenching and annealing, neutron tomography to reveal internal structures that are not visible to the naked eye etc.),

c) experimental archaeometallurgy applied to the use of the original material for making brass instruments, employing original tools and techniques—this amounts to historically informed manufacturing technology.

Obviously, all three of these research methods complement each other. Within the framework of the project, Martin Mürner devoted himself to the first approach, i.e., researching various sources of historical techniques and procedures,[26] investigating what technologies and tools were used for making instruments in the period and region being studied, how the individual steps of production took place, and how manufacturing was transformed by industrialisation. Mürner asserts that there is a lack of direct sources, and he derives information about period instrument making practice from the equipment of certain preserved workshops (Mahillon) or from property inventories made for bankruptcy proceedings. He also points out that period engravings often seen on manufacturers' price lists can be accepted only cautiously as a source of information because their primary purpose was to demonstrate the high level of quality of a workshop, so they can be distorted and misleading.

[26] Cf. MÜRNER, Martin: Blechblasinstrumentenbau im 19. Jahrhundert in Frankreich. Historische Quellen zur Handwerkstechnik. In: Allenbach, Daniel – von Steiger, Adrian – Skamletz, Martin (eds.): *Romantic Brass. Französische Hornpraxis und historisch informierter Blechblasinstrumentenbau*. Symposium 2. Musikforschung der Hochschule der Künste Bern: Vol. 6. Schliengen: Edition Argus, 2016, pp. 446–462.

Although the tradition of craftsmanship is the result of long-term development and shares common features across geographical regions, it is also determined by the individual differences related to the level of quality of the workmanship in a given area, the availability of material, the socioeconomic and cultural situation, and many other factors. For the first half of the 19th century, France was the leading centre for the making of brass instruments, but especially from the middle of the 19th century, France began to face increasingly significant competition from the Austrian tradition, sometimes also referred to as the Austro-Bohemian tradition. At the same time, the Prussian tradition played an indispensable part in the development of both approaches in connection with the reform of Prussian military bands.[27] The authors of the two texts that are the subject matter of this book take the Austrian-Bohemian tradition as their point of departure—Václav František Červený as the leading representative of the tradition and Josef Šediva as a disciple of the tradition who spread it to a wider territory from his new place of employment. Their practical observations can also be an interesting counterpart to the Bern project focused on research on the French tradition.

While there have at least been several instances of commentary on Šediva's manual in the scholarly literature,[28] Červený's article has basically been ignored by the musicological community. The reason for this is apparently that Červený's article appeared in a periodical not primarily focused on musicology, so it es-

[27] HEYDE 1987, op. cit.; SLAVICKÝ 2019, op. cit.

[28] KELLER 1979, op. cit., pp. 22–28; FREEMANOVÁ, Michaela: Vojenská hudba v českém časopisectví a odborné hudební literatuře 18. a 19. století. In: *Vojenská hudba v kultuře a historii českých zemí*. Ed. Jitka Bajgarová. Praha: Etnologický ústav Akademie věd České republiky, 2007, pp. 61–73, here pp. 70–71; ŽŮRKOVÁ, Tereza – HRUŠKA, Viktor: *Josef* Šediva *(1853–1915) a jeho sbírka hudebních nástrojů v Národním muzeu* – Českém *muzeu hudby*. Praha: Národní muzeum, 2016; ŽŮRKOVÁ, Tereza: Josef Šediva (1853–1915) and his Collection of Musical Instruments at the National Museum – Czech Museum of Music in Prague. *Galpin Society Journal*, Vol. 69, 2016, p. 225–238.

caped the notice of many scholars. The lack of knowledge about Šediva's manual is caused in part by the fact that although it had been printed, the publication was not widely available, and the language barrier was also something of an obstacle. It is the reasons set forth above and also the interest of Czech and foreign scholars in questions involving the Czech instrument making trade in the field of brass instrument manufacturing that have led me to write this study with the goal of introducing the two texts in question to the wider scholarly community because they are unique sources for the time when they were written, not only in a Czech context, but also for European instrument making in general.

Most of the book consists of an annotated edition of methodology texts by Václav František Červený (*O vyrábění hudebních nástrojů kovových* – On the Manufacturing of Metal Musical Instruments)[29] and Josef Šediva (*Návod na výrobu a objednání žesťových nástrojů, signálních pěchotních rohů, signálních jezdeckých trubek, bubnů a bubínků* – Instructions for Making and Ordering Brass Instruments, Infantry Signal Horns, Cavalry Signal Bugles, and Large and Small Drums).[30] For the sake of completeness, the decision has been made that as part of this project, Šediva's book will be made accessible through the digital library Kramerius,[31] and Červený's text can already be accessed in this

[29] ČERVENÝ, Václav František a synové: O vyrábění hudebních nástrojů kovových. *Listy průmyslové*, Vol. 4, 1878, No. 3, p. 25–26; No. 4, p. 40–42; No. 5, s. 54–55; No. 6, p. 64–65; No. 8, p. 91–92; No. 9, p. 101–102.

[30] ŠEDIVA, Josef: *РУКОВОДСТВО ДЛЯ ПРОИЗВОДСТВА И ДЛЯ ЗАКАЗОВЪ ДУХОВЫХЪ МЕТАЛЛИЧЕСКИХЪ МУЗЫКАЛЬНЫХЪ ИНСТРУМЕНТОВЪ, СИГНАЛЬНЫХ ПѢХОТНЫХЪ РОЖКОВЪ, СИГНАЛЬНЫХЪ КАВАЛЕРІЙСКИХЪ ТРУБЪ, МАЛЫХЪ И БОЛЬШИХЪ БАРАБАНОВЪ.* Odessa: G. Bekel, 1896.

[31] ŠEDIVA 1896 [digitised document]. Available from: https://kramerius.nm.cz/view/uuid:dd71bbcd-dd5c-4dd5-b55a-869b04636d90?page=uuid:4fa69dd3-6b54-42fb-b5ef-298d28d88729.

way.[32] To avoid taking information out of its historical context, the editions are preceded by introductory texts that briefly summarise both the questions of brass instruments in the nineteenth century in general and the history of brass instrument making in the Bohemian lands to make clear the kinds of roots from which this tradition arose and the foundations upon which it had been possible to build. The authors of the two texts in question are introduced by brief biographies, which are oriented, given the focus of this book, towards the issues of their trade rather than towards their personal lives, which are relatively well known and documented, especially in the case of Václav František Červený.[33] While there are still many gaps in our knowledge about the life of Josef Šediva,[34] detailed archival research at the place where he was working, the Ukrainian city Odessa, is complicated by the current political situation.

By publishing an edition of practical manuals of the period and setting them in a broader cultural and historical context, this book's goal is to contribute something towards our knowledge of a topic that is of increasing interest to researchers, performers, and musical instrument makers. However, a second, no less important intention of the present publication is to bring these texts to attention in an attempt to repay of our debt to both authors, who made the unselfish decision to share their many years of hard-won experience at a time when doing so was not at all common, thereby supporting the advancement of the trade to which they were totally devoted. Perhaps this book shall serve as

[32] ČERVENÝ 1878 [digitised document]. Available from: https://www.digitalniknihovna.cz/svkhk/view/uuid:087811f3-b050-4294-86bc-9167e7f821bc?page=uuid:cfa05317-dc04-11e7-bc7e-00155d012102.

[33] The current status of research and possible directions for further study are outlined in SLAVICKÝ 2019, op. cit.

[34] Most recently investigated in the monograph ŽŮRKOVÁ – HRUŠKA 2016, op. cit.; also cf. ŽŮRKOVÁ 2016, op. cit.

a monument to them, reminding us of their sacrificial efforts and achievements in an area in which scholars have heretofore tended to neglect their involvement. Let us honour their memory!

BRASS INSTRUMENTS IN THE 19TH CENTURY: THE SOCIO-CULTURAL BACKGROUND AND CHARACTERICS SPECIFIC TO THE BOHEMIAN REGION

From the perspective of music history, the 19th century is perceived as a relatively self-contained and objectively demarcated stage of European history, which usually tends to be associated with cultural, artistic, and social transformations in connection on the one hand with the ideological principles of Romanticism and strengthening nationalism, and on the other hand with the transition of the prevailing social order from feudalism to capitalism. From the first half of the 19th century, the cultural function of aristocratic residences began to decline, and the role of culture bearers began to shift to bourgeois society. Correspondingly, there was also a new stratification of the geographical cultural network, which was regrouped on the basis of the location of industry, musical and cultural institutions, and financial resources. Musical life was gradually becoming institutionalised and professionalised, in part thanks to the emergence of professional music education institutions (conservatoires, organ schools, private institutes). In general, as the bourgeoisie were making inroads into the sphere of social life, there was a striking transformation of the typology of cultural institutions—musical productions were becoming democratised and accessible to the broader public. Concert life was taking place (in view of the absence of dedicated concert venues in the modern sense of the word) in multipurpose halls; outdoor events were also plentiful. The role of the

symphony orchestra as we now understand it was being played by the orchestras of theatres, spas, private societies, and the military, and from the middle of the 19th century, one finds a gradual polarisation of music into separate spheres, one with artistic aims and the other for entertainment (or some other utilitarian purpose). The performing of music was newly acquiring the character of a commodity sold for an admission price. That shift placed new demands on musicians and on the quality of their performing (a typical feature of the period is the perfecting of performing technique and in general a cult of virtuosity), and this was further projected in the form of demand for the improved quality and innovation of musical instruments.

The Bohemian lands, which belonged to the Austrian monarchy (or Austria-Hungary from 1867), were also affected by these changes. Here, too, one can observe the gradually breakdown of feudalism, although the monarchy was still retaining its strong standing with administration and power centralised in Vienna, where the government was hindering both the aristocracy and the bourgeoisie from fully developing a capitalistic form of production, being afraid of the working class and its concentration in industrial areas. The German bourgeoisie assumed a stronger role, especially at first, while the Czech bourgeoisie were weaker and tended to focus on crafts and small business. The 1840s were still under the sway of lingering Metternichian absolutism, which was soon superseded by the absolutism of Baron Alexander von Bach, but despite this, new stimuli and impulses were having an increasing impact on society. A significant transformation to the development of the economy and business arrived with the establishment of chambers of commerce and industry (Handels- und Gewerbekammern, 1850) and especially the promulgation of the Trade Act (Gewerbeordnung, 1859), which permitted free

enterprise. For the trades (including the making of musical instruments), this amounted to a historical milestone and brand new market principles for trades that had previously been highly regulated by craft guilds.[35] More revolutionary changes came in the early 1860s, when the emperor issued the "October Diploma" (Oktoberdiplom, 20 October 1860), yielding absolute power, acknowledging the legislative powers of territorial parliaments (Landtage) and of the Imperial Council (Reichsrat), and defining their jurisdiction. The Austro-Hungarian Compromise of 1867 was a disappointment to the Czechs because it overlooked the rights of the Czech people, and it led to the fragmentation of the Czech political scene into the Old Czech and Young Czech parties. While the two parties shared the goal of achieving a Czech-Austrian settlement, each group took its own approach towards attaining that goal. While Austria's attention was focused on foreign policy, where it was becoming increasingly dependent upon Germany, patriotically-minded Czechs embraced an increasingly nationalist ideology with the addition of a theory of Slavic solidarity with a predominantly Russophile orientation. It is therefore unsurprising that during the period in question there was a sharp increase to emigration and not only to America; large numbers of emigrants headed for tsarist Russia, where the trend took root very strongly in the realm of musical culture.

Linguistic dualism is a characteristic feature of the culture of the Bohemian lands during this period. The German language was indispensable not only for dealings with state officials at higher levels, but also for commerce; neither the process of na-

[35] The Habsburg monarchy demonstrated the level of its commerce and entrepreneurship at the 1873 Vienna World's Fair, for which careful preparations had been made for several years. It turned out to be a major event, showcasing the country's economy and reflecting the economic and social changes taking place in the monarchy. URBAN, Otto: *Česká společnost 1848–1918.* Praha: Svoboda, 1982, p. 274.

tional emancipation nor strengthening patriotism could dislodge the German language. In spite of this, the standing of the Czech language and its role in the Czech National Revival also gradually took shape. The first progress towards fostering Czech-language scientific literature was made in the area of terminology, and it is not without interest that the field of musical instrument making contributed significantly in this area in the form of a proposal for Czech terminology for brass instruments prepared by Václav František Červený.[36] Patriotism and efforts to enhance the prestige of the Czech nation manifested themselves through support for a range of other activities linguistically or historically associated with Czech culture. A characteristic feature of the whole 19th century was the founding of various kinds of societies and other cultural and social institutions, including the establishment of the Patriotic Museum of the Czech Nation (today the National Museum) in 1818. The mainstay of the museum's holdings consisted of the private collections of the Czech nobility, but that foundation was soon supplemented by donations of individual items and of whole collections from all around the country. The National Museum became a demonstration of Czech pride and proof of the Czech nation's wealth of history and culture, something about which many Czech patriots had very intense feelings. In comparison with the present conception of a museum as an institution that is generally understood nowadays above all as documentation of the history of

[36] ČERVENÝ, Václav František: *Hudební názvosloví čili pojmenování žesťových (plechových) hudebních nástrojů a některých dílů jejich* [Musical Terminology, or Nomenclature of Brass Musical Instrument and Certain Parts Thereof]*, které k docílení stejného pojmenování sestavil a laskavým odběratelům jakož váženému obecenstvu ve vší šetrnosti obětuje Vácslav Frant. Červený*. Hradec Králové: J. H. Pospíšil, 1847. In the 1860s he worked on the publication *O rozličnosti plechových nástrojů hudebních, jich pojmenování a tonu či zvuku* [On the Diversity of Brass Musical Instruments, Their Nomenclature, and Their Notes or Sound]. Červený was an ardent patriot, and he felt the need to strengthen Czech as the nation's language, which he quite vigorously promoted as part of his involvement in municipal politics in Hradec Králové. For more information about this, see PAVLÍK 2006, op. cit., pp. 39, 46.

a particular area or sphere, back then the museum's mission was seen as being strongly emancipatory with the task of earning the nation equal standing in emerging modern society. This perception is also documented in the example of Josef Šediva; after he left his homeland, he worked in Odessa until the end of his life, but he was keenly aware of his Czech ethnicity, so he decided to enrich the museum's collections with a magnificent donation of his own instruments, which were the most modern examples of his trade at the time; in explanation of his donation, he wrote: "[…] *In the hope that this collection will serve to the honour of our* [Czech] *industry and arts* […],"[37] "[…] *so that* [foreigners] *will see that Czechs are wind instrument makers of the first rank and that we can compete with the entire world in this field in all respects*."[38] A contribution to the strengthening of national identity through developing industry and business was made by the establishment of economic interest groups (e.g. Jednota ku povzbuzení průmyslu v Čechách [the Society for the Encouragement of Industry in Bohemia], founded in 1833[39]), technical schools, and technical journals and literature; this reached its climax at the end of the period in question by the holding of the Jubilee Economic Exhibition in Prague in 1891 and especially of the Czech-Slavic Ethnographic Exhibition in 1895.[40]

[37] Letter from Josef Šediva to Alfréd Slavík, director of the Museum of the Kingdom of Bohemia (today the National Museum), Odessa, 10 March 1906. Archiv Národního muzea [National Museum Archives], Registratura Národního muzea (hereinafter ANM-RNM), carton 64, Nos. 661–663.

[38] Letter from Josef Šediva to the Administration of the Museum of the Kingdom of Bohemia, Odessa, 15 July 1908. ANM-RNM, carton 69, No. 1484.

[39] One of the declared goals was the education of Czech craftsmen, self-employed persons, and entrepreneurs in their native Czech language because in the opinion of economists at the time, the foundation for entrepreneurial success was not just sufficient operating capital and cheap credit, but also educational capital. That idea was to have been realised by the establishment of a model Czech industrial school. ŠTAIF, Jiří: *Obezřetná elita. Česká společnost mezi tradicí a revolucí 1830–1851*. Praha: Dokořán, 2005, p. 155.

[40] BROUČEK, Stanislav a kol.: *Mýtus českého národa aneb Národopisná výstava československá 1895*. Praha: Littera Bohemica, 1996; LACINA, Vlastislav: *Hospodářství českých zemí 1880–1914*. Praha: Historický ústav ČSAV, 1990.

All of these multilayered transformations of society were strongly reflected both artistically and technologically in the sphere of musical instrument manufacturing. Technological progress in connection with the industrial revolution and transformations of the institutional landscape had the greatest impact on the development of brass instruments in of the latter half of the 19th century; in particular, the purchasers of instruments influenced changes. As will be shown below, these prerequisites led to an unprecedented flourishing of the variety of brass instruments, and this in turn also influenced both the development of technology and the institutions in question. The modern variety of brass instruments can thus be seen as a consequence of many years of interaction of all three points of this triangular relationship.

EVOLUTIONARY CHANGES TO BRASS INSTRUMENTS

This chapter does not set out to summarise the overall development of brass instruments in the 19th century because there is already plenty of organological literature devoted to this topic in general or to its individual issues. Rather, the goal is to deduce general characteristics related to the development of brass instruments and to draw attention to certain features of this process that were specific to the Bohemian lands. In the next chapter (*Brass Instrument Making in the Bohemian Lands in the Latter Half of the 19th Century*), these general conclusions are then placed within the concrete framework of Czech instrument making culture.

The era in question, especially if we expand it to include the period from ca. 1830 to 1930, is typified by the unprecedented advancement of brass instruments mainly in terms of making

the notes of the chromatic scale available thanks to the invention of valves and the making of new forms of brass instruments covering the ranges from the highest soprano to the lowest contrabass registers. Of course, one already can find other solutions for brass instruments from earlier periods that enabled playing chromatically, but only with the invention of valves was this problem solved in a manner that has since remained unsurpassed.[41] The fact that brass instruments became capable of chromatic playing during this period resulted in their unprecedented flourishing, and that led to a tendency towards their further perfecting. A typical feature of this rapid development was the making of new designs for brass instruments that were appearing so regularly and frequently that often even the people living at that time lacked an orientation in the instruments' nomenclature.[42] Other social and philosophical circumstances were also playing a role in this process, including Darwin's theory of evolution, the principle of which was the idea that everything new is unavoidably better. Period manufacturers therefore constantly strove to innovate brass instruments and competed for recognition at industrial exhibitions, which had become one of the period's most effective tools

[41] Overviews of various ways to extend the chromatic capabilities of brass instruments and the invention of valves in their various forms have been dealt with in detail in the technical literature, especially most recently in KLAUS, Sabine Katharina: *Trumpets and Other High Brass.* Volume 3: *Valves Evolve*. Vermillion, SD: National Music Museum, 2017. Also cf. BAINES, Anthony: *Brass Instruments. Their History and Development*. New York: Dover Publications, 2012; DUMOULIN, Géry: The Cornet and Other Brass Instruments in French Patents of the First Half of the Nineteenth Century. *The Galpin Society Journal*, Vol. 59, 2006, pp. 77–100; DAHLQVIST, Reine: Some Notes on the Early Valve. *The Galpin Society Journal*, Vol. 33, 1980, pp. 111–124; HEYDE, Herbert: Zur Frühgeschichte der Ventile und Ventilinstrumente in Deutschland (1814–1833). *Brass Bulletin*, 1978, No. 24, pp. 9–33; 1979, No. 25, pp. 41–50; No. 26, pp. 69–82; No. 27, pp. 51–61.

[42] Experimentation with the shapes of brass instrument was not always received respectfully. Concerning this trend, the French bandmaster Georges Kastner (*Manuel général de musique militaire à l' usage des armées françaises*, Paris: Didot Frères, 1848) said that manufacturers were overusing "*bizarre and fantastical shapes*", but which in reality offer nothing new. SLAVICKÝ 2019, op. cit., p. 58. Incidentally, the period in question can also be seen as the beginning of the tradition of patents intended to ensure manufacturers' exclusivity and competitiveness in the marketplace nationally and internationally. Cf. DUMOULIN 2006, op. cit.

for advertising and business strategy.[43] Besides new chromatic capabilities, another influence on the development of this family of musical instruments was its growing popularity because the new forms of brass instruments covered the ranges from the highest-pitched soprano instruments down to the lowest in the contrabass register,[44] so they found broad applications in all kinds of musical ensembles of professionals and amateurs. Czech instrument manufacturers were playing a significant role in these processes, whether this involved inventions and refinements of valves[45] or new kinds of instruments.[46]

Another characteristic feature of the period that had a powerful influence on the development of the variety of available instruments was the transformation of the marketplace. This was related not only to new technological possibilities, but also to the enormous growth of demand for brass instruments. Besides a tendency towards constructing innovative shapes, manufacturers were also attempting the opposite, i.e., a certain standardisation of production, the simplification and efficiency of which led to the possibility of mass production. Brass instruments had also become so popular among amateur musicians that some manufacturers were specialising in making cheaper instruments intended for broad strata of amateurs. Also related to mass production was the gradual standardisation of individual forms of instruments. In particular, it was large firms that divided the man-

[43] Concerning the marketing tactics of this period, cf. HERBERT, Trevor: Selling Brass Instruments: The Commercial Imaging of Brass Instruments (1830–1930). *Music in Art*, Vol. 29, 2004, No. 1/2, pp. 213–226.

[44] The first brass instrument in the contrabass range is Červený's contrabass tuba, patented in 1845.

[45] Including Josepf Felix Riedl (born in Kraslice!), Joseph Kail, Václav František Červený, and Josef Šediva. See the literature cited in footnote no. 41.

[46] In particular Václav František Červený (for an overview of patented and unpatented inventions; see e.g. KURFÜRST, Pavel: *Hudební nástroje*. Praha: Togga, 2002, pp. 861–862). For an overview of Šediva's inventions, see ŽŮRKOVÁ – HRUŠKA 2016, op. cit.

ufacturing process into several phases, acquired some parts from smaller manufacturers, then finished the assembly of complete instruments in their workshops, or (to the contrary) specialised in producing individual components. Of course, standardisation involved not only instruments' shapes, but also their tuning. After the introduction of valved instruments, valved and natural instruments were being used in parallel for some time with the employing of terminal crooks, leading to false intonation. Attempts to standardise tuning led to the inventing of various kinds of equipment for pitch adjustment (e.g., Červený's "Tonwechselmaschine" or Gautrot's "transpositeur"), but there was an increasing tendency towards the standardisation of tuning of individual instruments. Unlike woodwind instruments, which were also undergoing major changes (Böhm system), but for which the older systems were also more or less adequate for routine use so the acquiring of a complete set of new instruments was not economically advantageous, the new variety of available brass instruments was adopted much more quickly, and manufacturers tried to force bandmasters to supply whole ensembles with instruments from a single maker. This was supposed to insure the whole ensemble's uniformity of sound. For this reason, manufacturers were making most types of instruments in all registers, from soprano down to contrabass.[47]

A third characteristic that was typical of the period in question was polarisation into two or three conceptions of brass instrument making, which were geographically determined and were related to the local traditions of craftsmanship and musical taste. Usually, the French tradition, with Adolphe Sax as its leading

[47] RAULINE, Jean-Yves: 19th-Century Amateur Music Societies in France and the Changes of Instrument Construction: Their Evolution Caught between Passivity and Progress. *The Galpin Society Journal*, Vol. 57, 2004, pp. 236–245, here p. 239.

representative, is described as being in opposition in this sense to the central European or Austrian (or Austro-Czech) tradition, which is represented by Václav František Červený. Of course, the German tradition represented mainly by the Berlin manufacturer Johann Gottfried Moritz had its own specific features, but the first two conceptions mentioned above were the most prominently successful, and the German conception gradually merged with the Austrian tradition. The French school had its sphere of influence mainly in the English- and French-speaking world, while on the other hand the Austrian school had its sphere in central and eastern Europe and to some extent also in the south.[48] The main differences between the French and the Austrian traditions are identified by V. F. Červený in his printed treatise,[49] which was published in reaction to the results of the competition at the 1867 Paris Exhibition. He identified the main differences as the kinds of valves used (in France, piston valves were located at about the middle of the length of the tubing, while rotary valves from Austrian countries were closer to the mouthpiece) and above all the instruments' bore size (the French tradition of narrower bores is based on the cornet's shape, with its more piercing sound and more brilliant high notes, as opposed to the wide bores of Austrian instruments based on the shape of the flugelhorn with a characteristically rounder, fuller sound).[50] However, the polarisation of these two conceptions was also significantly related to a new

[48] In particular the Balkan Peninsula, but also the part of Italy that was within the Austrian sphere of influence. Cf. MEUCCI, Renato: Brass bands and the brass instruments industry in 19th-Century Milan. In: *Wissenschaftliches Jahrbuch der Tiroler Landesmuseen*, Vol. 3, 2010, pp. 101–113. In Italian libraries, several price lists for brass instruments from Austrian manufacturers have been preserved, and some of them were printed bilingually in Italian and German. Ibid., p. 103. A price list of the Prague manufacturer A. H. Rott in German and Italian has been preserved in the collection of the Tiroler Landesmuseen in Innsbruck (see Fig. 3).

[49] ČERVENÝ 1868, op. cit., p. 6. Červený refers to a statement made by Ernst Pauer, a jury member at the 1862 International Exhibition in London. Also cf. SCHEBEK, Edmund: *Bericht über die Orchester-Instrumente auf der Pariser Welt-Ausstellung im Jahre 1855*. Wien 1858, pp. 13ff, 26ff.

[50] SLAVICKÝ 2019, op. cit.

type of institution employing the available range of brass instruments on a massive scale, namely military wind bands.

INSTITUTIONAL TRANSFORMATIONS AND THE PHENOMENON OF MILITARY WIND BANDS

The new variety of available brass instruments took shape in part as a consequence of the growth of military wind bands and of their importance to the musical culture of the period. Their original, primarily military function was downplayed as they acquired, to the contrary, an increasingly ceremonial character.[51] As has already been mentioned, this was connected with the changes to the socio-political structure in Europe at the turn of the 18th and 19th centuries, when the institutions supporting musical performing were undergoing a major transformation—palace ensembles and church music were gradually losing importance with the rise of bourgeois society, which viewed musical performing as something public and available to all at such venues as squares, parks, music halls, and taverns. For these purposes, military bands proved to be the most useful because they, unlike other musical societies, were not under existential threat,[52] had a broad repertoire (besides original compositions, there were also arrangements of the day's popular operatic and symphonic repertoire), and had enough members with a musical educa-

[51] KAPUSTA, Jan: Vojenské kapely a česká národní společnost 19. století. *Hudební věda*, Vol. 8, 1971, No. 2, pp. 220–235. HERBERT, Trevor: Adolphe Sax, his saxhorns and their international influence. In: *Revue belge de Musicologie / Belgisch Tijdschrift voor Muziekwetenschap*, Vol. 70: Adolphe Sax, his influence and legacy: a bicentenary konference, 2016, pp. 65–76.

[52] In Prussia and France, military bands were supported financially and run by the state, but in Austria the tradition of the owners of regiments maintaining bands persisted until the First World War. As Tomáš Slavický has pointed out, this method of funding was actually a transformation of aristocratic patronage, which had shifted in the 19th century from supporting churches and schools to military regiments. SLAVICKÝ 2019, op. cit., p. 53.

tion.[53] Moreover, unlike symphony orchestras or theatre orchestras, military ensembles reacted much more readily to all the innovations, thereby providing manufacturers with feedback.[54] The instruments used by these military bands were made with playing outdoors in mind, and this gave the ensembles yet another advantage because a considerable portion of public performing in those days was being done outside. For this reason, many manufacturers actually focused on production for military bands, for which innovations were often directly intended.[55] This direct relationship was mutually advantageous because military bands not only provided the manufacturers with a large market, but also helped spread the instrument makers' reputations and promote their designs for innovative instruments.

In the 19th century, some of the best military ensembles were the bands in Austria, France, and Prussia, and the differences in their staffing and in the types of instruments they used played a part in the polarisation of the instrument making traditions mentioned above. Because of Austria's complicated domestic political situation as an ethnically mixed state, the empire maintained high levels of enrolment in its military even during peacetime, and that provided the personnel for large numbers

[53] The Society for Military Music, established in 1850, operated a military music school in Prague from 1856, where it provided music education free of charge (VALEŠ, Vlasta: Pavlisova Vojenská hudební škola. In: *Vojenská hudba v kultuře a historii českých zemí*. BAJGAROVÁ, Jitka (ed.). Praha: Etnologický ústav Akademie věd České republiky, 2007, pp. 325–333), and in the last quarter of the 19th century, half of Austria's bandmasters were graduates of the conservatoires in Prague, Vienna, Leipzig, or Budapest, or they had studied at organ schools. Others were graduates of military music schools or were pupils of important teachers of musical instruments or of composition (KAPUSTA 1971, op. cit, p. 225). A military music school was opened in Paris already in 1836, and in England in 1857. VIČAROVÁ, Eva: *Rakouská vojenská hudba 19. století a Olomouc*. Olomouc: Univerzita Palackého v Olomouci, 2002, p. 41. Moreover, an imperial decree was issued in 1835 to add strings to Austro-Hungarian military bands, enabling the ensembles to play as a full-fledged symphony orchestra. Ibid., p. 26.

[54] SLAVICKÝ 2019, op. cit., p. 47.

[55] Červený's first patented invention, the cornon (1844), was in fact a French horn adapted for military wind bands by giving the body an upright shape like a tuba. Červený later adapted the trombone for military bands (military trombone, 1876) etc.

Vážení čtenáři, právě jste dočetli ukázku z knihy ***The Czech Tradition of Brass Instrument Manufacturing in the Latter Half of the 19th Century in the Light of Practical Manuals of the Period*.**

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