

# Equipment Matters

by Wolfgang Lohff

## HELP, MY CLARINET IS SHARP! ... TO BORE OR NOT TO BORE

**T**here comes a point in the life of our beloved clarinet when most of us will notice it begins to play sharp. This is when the clarinet starts to reach the point where it becomes “blown out.” The question is, “What is going on, and can it be fixed?” This problem begins with a devilish cycle of circumstances.

First, you will notice that your clarinet is getting sharper and sharper. The resistance of the instrument has gradually disappeared over time – you didn’t even notice it going, but you start to lose control of the sound. Whenever you play a crescendo, you reach a point where the sound is bright, open and unfocused.

In the attempt to solve this problem, you start to look for a longer barrel. This is a quick fix and will help you only temporarily. With the longer barrel, your left-hand notes are now lower than your right-hand notes. The influence of the longer barrel will improve the tones closer to the mouthpiece more than the ones further away. Sadly, the longer barrel will not help you get back your sound, focus, resistance and overall control of the instrument.

Next begins the mouthpiece hunt. This can be the most frustrating and tedious task. You would like to get back the sound and focus that you once depended on, and eventually you will find a good, working mouthpiece that seems to be the golden graduate. Chances are that your new

mouthpiece will have a closer facing than your old one, and you may even begin to use harder reeds.

For a long time, we do not really understand the reasoning behind this “blow out” behavior and what caused it. Over the years, we at Lohff and Pfeiffer have measured countless instruments to compare the old measurements with the new measurements after several years of use. We started to notice the same pattern again and again. There are three interesting observations in this picture:

- 1 The effect of “blow out” is more common on the narrower-bored instruments.
- 2 Players who formerly chose models with a smaller bore suddenly preferred instruments with a wide bore due to the minimal resistance and “ease of blowing.” These players would often complain that “the new instruments are not as good as those of years ago.”
- 3 In discussions with European mouthpiece makers, we learned that they have had all of the same observations – players of older instruments prefer closer facings.

What could cause the bore to change, encouraging the player to prefer a different mouthpiece facing? Looking at the bore changes more closely, we observed that the bore discrepancy was not equal. The narrowest part of the bore at the top of the upper joint changed more than the wider

part, and as soon as the bore was about 0.1 mm wider than the original bore, the instrument became noticeably sharper. This raised our curiosity further.

It is hard to imagine that the airstream passing through the bore would cause so much damage. The same applies to moisture running down the bore; how could it change the bore size? We found that there could only be one conclusion: the culprit is the swab! The daily swabbing causes the increase in the bore size. We realized that the bore increase was due to the friction of the swab being pulled through the bore several thousand times over the life of the instrument.

In considering the aforementioned theory, there are four different options. You could choose to go through the above-mentioned barrel/mouthpiece ordeal and spend lots of hard-earned money and time to find the right combination, but you’ll need to consider that the warmth of tone and focus will never be regained. Another option is to get the instrument retuned, pitch by pitch. Again, the tone and resistance in the sound will not return. You also could choose to replace the instrument with a new one, something that may be out of your budget.

The option we recommend is to reverse the problem by literally “shrinking” the bore to its original size, introducing to the clarinet world a technique we have used on oboes very successfully.

Altering the bore of a clarinet is one of the most challenging tasks of any instrument technician. The bore is the heart and soul of the instrument, the most important part! As it is responsible for the sound, intonation, resistance, airflow and projection, even the smallest variations in the bore can cause or even solve serious acoustic problems.

The bore changes over time and in all environments. When you measure the bore on one day in a room with 60 percent humidity and then the next day in a room with 40 percent humidity, you will find two different bore sizes on the same instrument. A very thorough understanding of the varying bore sizes caused by temperature and humidity is important in creating a method to reduce the size of the bore.

The good news is that we found a technique to make the bore smaller again. Well actually, we found three techniques. And all three techniques work! Like so often, the devil lies in the details – in our case, the dimensions we have to work with. Depending on the wear, the bore might

be 0.1-0.3 mm (0.004-0.012 in) too wide. This means that we will have to reduce the bore by the same amount which equals 1 to 4 layers of paper. For the project to be successful it is important to know not only the exact original dimensions from years or sometimes decades ago, but also how much undercutting each model needs. The next challenge is the production of a sleeve – which is very fragile until finally mounted inside the instrument – and a method of inserting it safely into the old bore. The sleeve can be made of wood, plastic or composite material.

Reducing the bore size brings the pitch down and the warm, dark tone returns to the instrument. The resistance and control return as well – all of this for a fraction of the cost of a new instrument. James Campbell said about his clarinet after a bore exchange, “Thank you so much for bringing my 1985 Selmer Recital fully back to life; it is playing even better than when it was at its best in the 1990s.”

Perhaps the best news of all is the importance of successfully reinventing

the wood of our instruments again and again. Since January of 2017, the African blackwood tree (*mpingo*) of East Africa was listed as endangered according to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). This stark reality of resource reduction is a reminder that we must find ways to extend the life of the products we have, for the future. ❖

#### ABOUT THE WRITER

*Wolfgang Lohff received his education at the SML-Strasser Marigaux oboe factory in France, the Fox Bassoon corporation in the U.S. and the Mateki flute workshop in Japan. Since 1986 he has run the Lohff and Pfeiffer woodwind shop with his spouse Birgit Pfeiffer in Copenhagen, Denmark. They specialize in optimization and customization of woodwind instruments and have been working for musicians from over 80 countries around the world. Since 2014 they have operated in the U.S. and are based in Takoma Park, Maryland.*