From a Luthier's Notes:
"A Word About Pegs"

Sebastian Stenzel, Jan. 2021

I often wonder to what degree most oud players tolerate badly working pegs in their instruments. Well, more and more do not, and take refuge to mechanically geared pegs like *Wittner Fine Tuning Pegs* or *Perfection Pegs* - a choice I can perfectly understand, especially from performing musicians who travel a lot and therefore have to cope with sudden changes in humidity. (It is not funny, when your pegs jump loose two hours before you have to be on stage, because the dry air of your hotel's AC made the pegs shrink in diameter.)
That said, I would like to state that I prefer nothing over good working, traditional wooden pegs, because they allow a very direct tuning, are light in weight, and are not made of plastic or other materials I prefer not to use in my ouds. But it seems that most oud players have never come across really good working pegs. How can that be?

Well, to start with, most pegs are made of ebony, boxwood or tamarind wood (the later has mostly replaced the much more suitable Indian rosewood in recent years because of trade regulations), and all these wood species are bad choices for pegs for two reasons: first, being extremely hard, they wear out the hole in the pegbox faster, and, secondly, the shrinking and swelling of the wood as a reaction to changes of air humidity is not as low as that of some other species. The shrinking and swelling affects the roundness of the peg shaft, because it occurs more tangentially to the annual rings of the wood than radially (parallel to the wood fiber, the shrinking and swelling is negligible), resulting in a peg shaft with an oval cross section. The same often happens to the hole, and an oval shaft in an oval hole can certainly make you think about an alternative for tuning your instrument. A solution to mitigate this problem is not that difficult to find, though: you need wood that is hard, but not too hard, wear-resistent but not abrasive, and it should have the lowest possible shrinkage and swelling. Last but not least, it should have excellent acoustical properties, what in my opinion can not be said about ebony and boxwood, because of rather high internal damping. However, there are many wood species that fulfill all these requirement, and my personal favourites are sorb tree (sorbus domestica), Swiss pear (sorbus torminalis) und plum tree (prunus domestica).
Of utmost importance of any wood to be used for musical instruments and especially for pegs is the drying process. The wood should have been air-dried for many years and exposed to constant changes in humidity and temperature, only then the shrinking and swelling is reduced. Neither drying it in a kiln nor having it sit in your workshop for years on end will have this effect.
With the right wood, well dried, and expertly crafted, you can make a really good peg.

What was said about the wood for pegs also applies to the pegbox, but an additional requirement should be met: its wood should resist cracking, as the many holes tend to form a perforation line. For this reason, the walls of the pegbox should be made of at least two layers each to reduce the risk of cracks. For centuries, lute makers in Europe have chosen beech wood, as do some oud makers, including me, with maple probably being the second common choice.

With best quality pegs and pegbox, there are two more aspects to consider: the first is the size of the peghole itself that is affecting the smoothness of tuning. By size, not only the diameter is relevant (when it is smaller, tuning is finer, because less string is wound up, but also the amount of shrinking and swelling is proportionally smaller), but also the length of the hole; together they define the contact surface to which the friction applies. It is a common misunderstanding that this surface should be large. In fact, there is a very good argument to keep it smaller: The peg only keeps its position after tuning, because both peg and pegbox are squeezed against each other, actually creating a tiny deformation of the wood. A smaller contact surface allows this to happen more easily, making a smoother change from turning the peg to locking it.
The last point is the peg soap, a compound that at the same time lubricates and breaks the turning of the peg. In good keeping with the tradition of generations of violin makers, I will keep my recipe secret!-)

In the near future, I am planning to experiment with „roasted“ or torrefied sorb tree. Torrefaction is a process where the wood is heated to temperatures around 200 °C with no oxygen present. One of the changes achieved by this process is a drastic decrease in shrinkage and swelling. These pegs, properly fitted, should work perfectly for decades.