Bassoon - Dinosaur or Innovation?

Williams, Zoe (School: Athens High School)

The bassoon itself was invented in the 17th century, however its predecessors were seen throughout the Middle Ages. In comparison to modern, objectively cheaper and easier instruments such as the saxophone, the bassoon often feels antique and unnecessarily complicated. Additionally, bassoons rarely cost below $10,000, making them inaccessible to many musicians. I set out to both simplify the modern bassoon model and provide a way to create one with significantly cheaper materials. The two forms that wind instruments can have are cylindrical and conical; both shapes have their own unique effects on the wavelengths produced by the instrument. Cylindrical instruments, with both ends of the instrument open, will produce n number of quarter wavelengths calculable by the formula f=nv/2L. When one end of the body is closed, the wavelengths change to n number of half wavelengths calculable by f=nv/4L. Quarter wavelengths will only produce even harmonics, while half wavelengths will produce both odd and even harmonics. Originally, I attempted to make a cylindrical bassoon model, which adds odd harmonics, making the instrument shorter while still retaining the modern bassoon's timbre and range. Though this was wrong, I did find the ideal bore angle for a conical model despite strange results in harmonic series calculations. Next, while attempting to create finger holes, there was yet another issue in calculations not matching measured data. Several other inconsistencies were found throughout this process, and I now also seek to explain these issues, as well as create a functioning prototype bassoon.

Awards Won: