

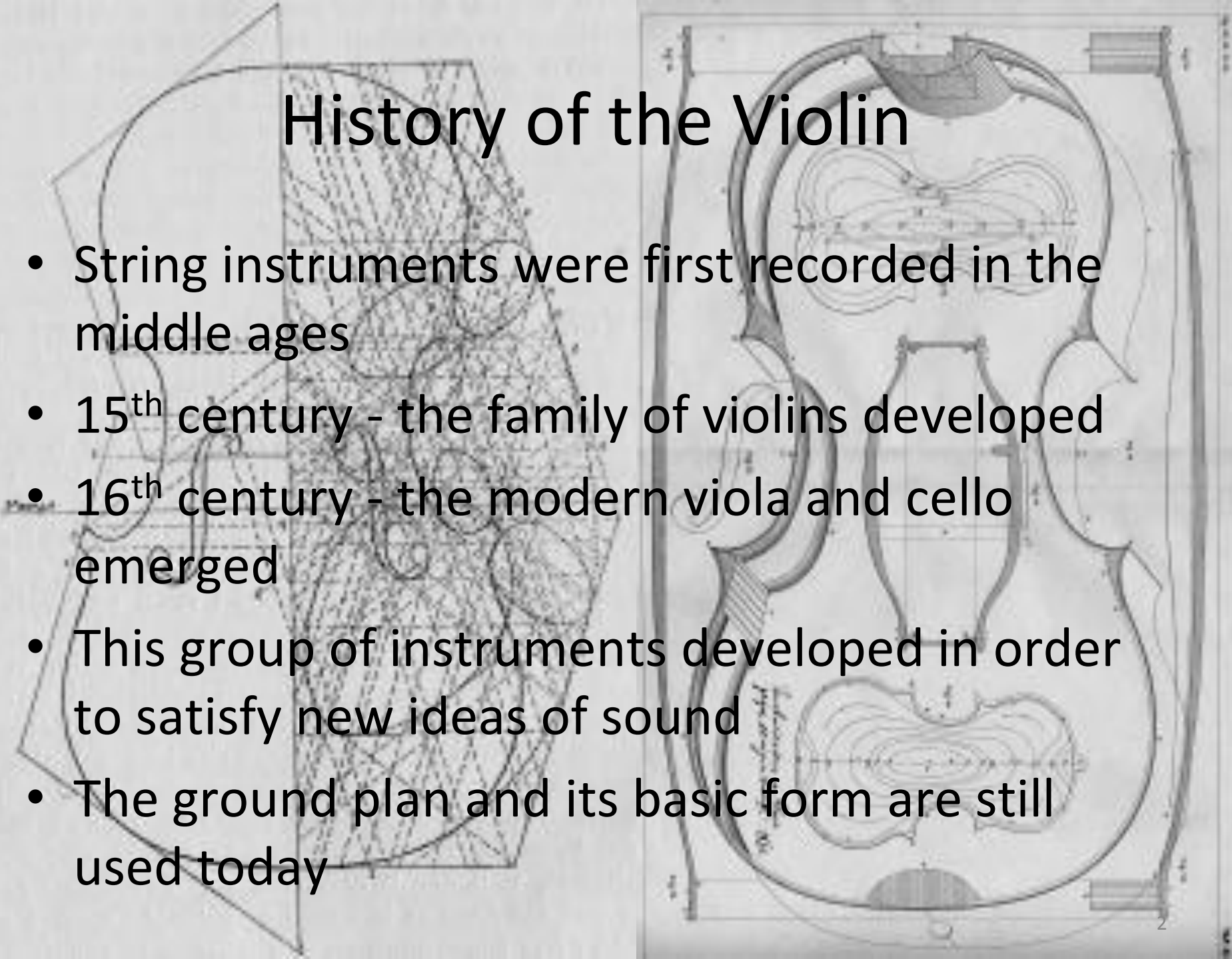
A close-up, warm-toned photograph of the interior of a violin body, showing the intricate woodwork and the bridge. The lighting is soft and focused, highlighting the textures of the wood. The title text is overlaid in the upper right quadrant.

How the Build of a Violin Accommodates Sound

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History of the Violin

- String instruments were first recorded in the middle ages
- 15th century - the family of violins developed
- 16th century - the modern viola and cello emerged
- This group of instruments developed in order to satisfy new ideas of sound
- The ground plan and its basic form are still used today



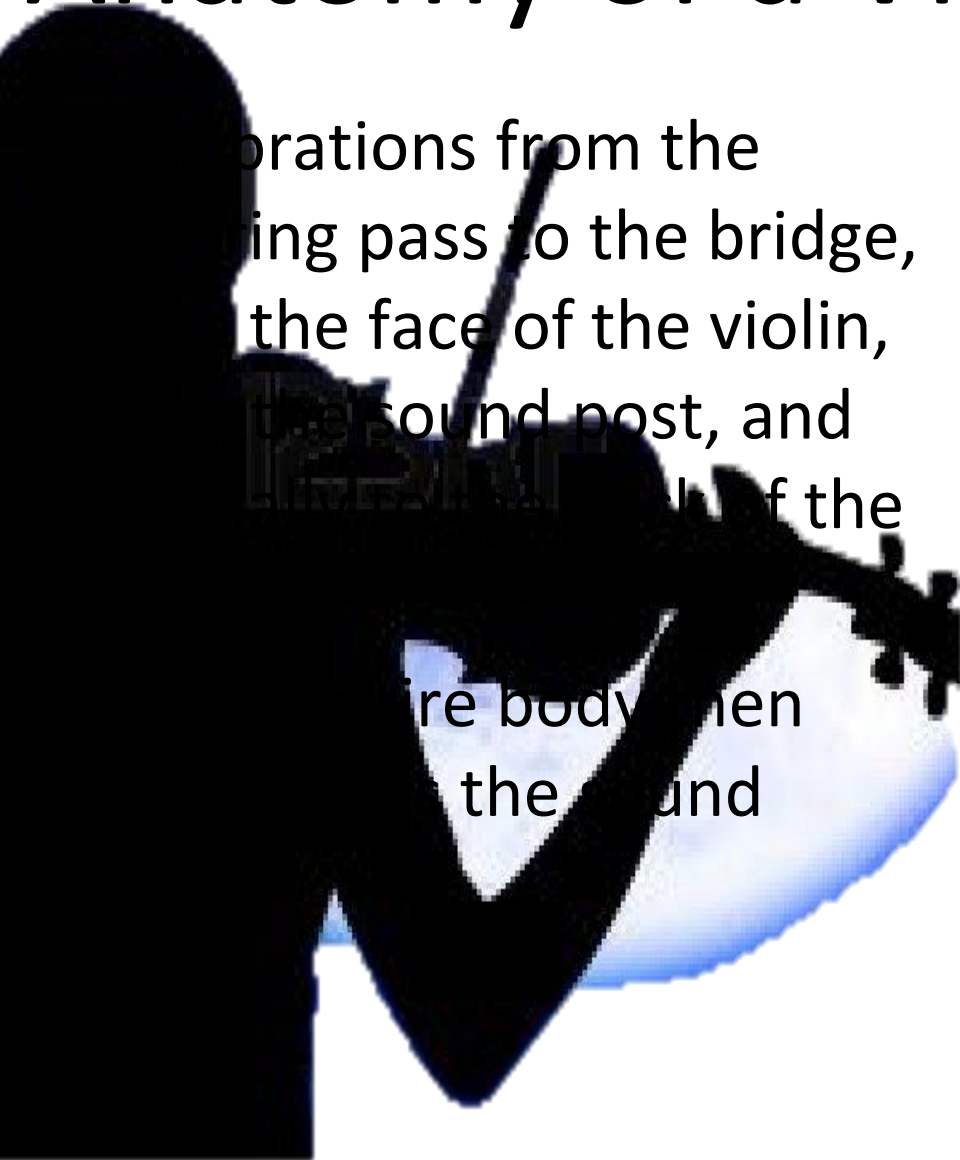
The Basics of Violin Acoustics

- The body of the violin acts as a resonator and an amplifier
- The bridge transfers energy of string vibration to the body of the violin. The bridge itself is very effective at transmitting power to the body.
- The soundpost is a small post connecting the flexible belly plate of the violin to the much stiffer back plate.
- This post prevents the belly from collapsing under the vertical component of the tension in the strings, and it also couples the vibrations of the plates.

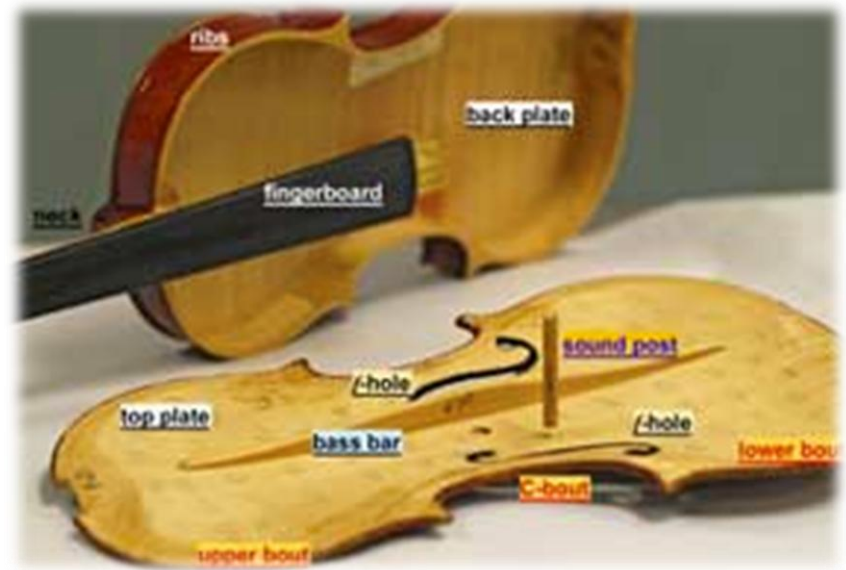
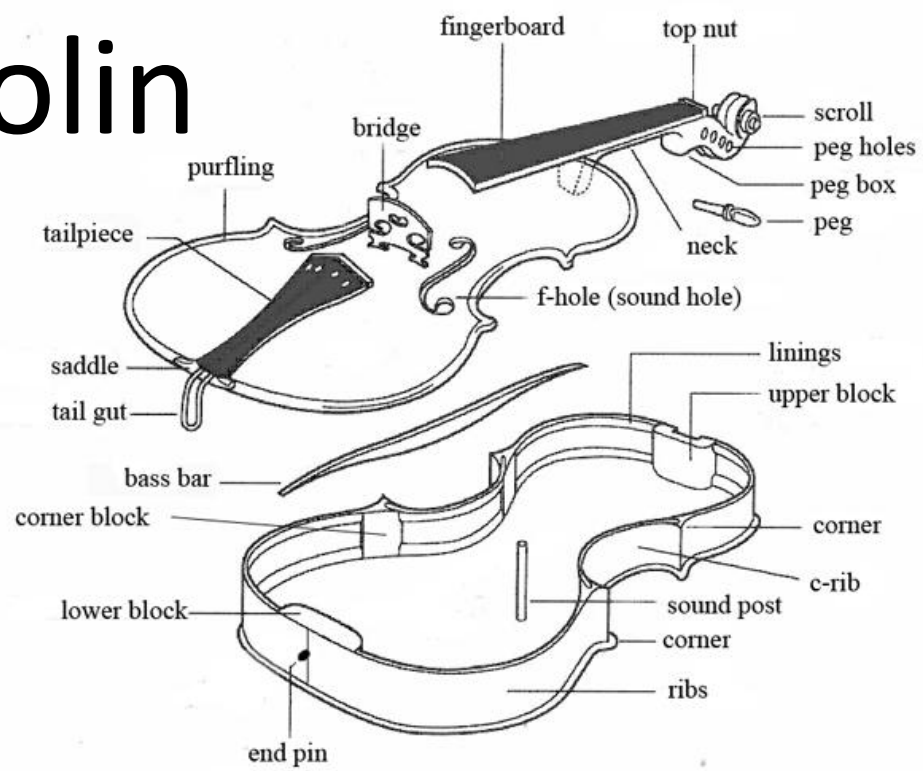
The Basics Continued...

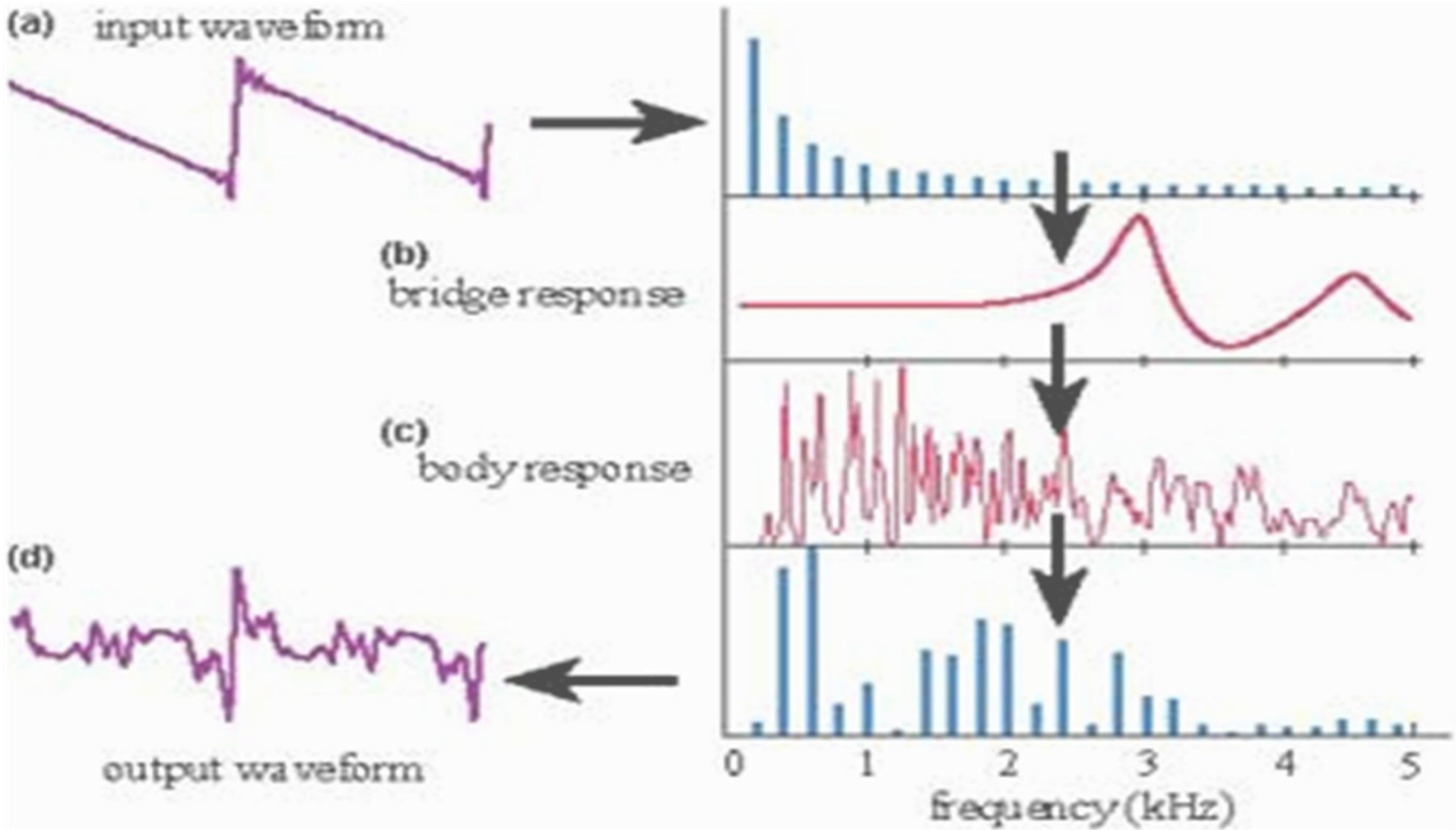
- The length of the string determines the pitch and can be tightened or loosened at either end by either the pegs on the peg box or the fine tuners on the tail piece.
- Thicker, more massive strings vibrate more slowly creating a deeper sound as in the G and D strings. Thinner strings create a higher sound such as the A and E strings.
- The strings themselves make hardly any noise: they are thin and slip easily through the air without making much of disturbance. It is the bridge and body of the acoustic violin that transmit some of the vibration of the strings into sound in the air.

Anatomy of a Violin



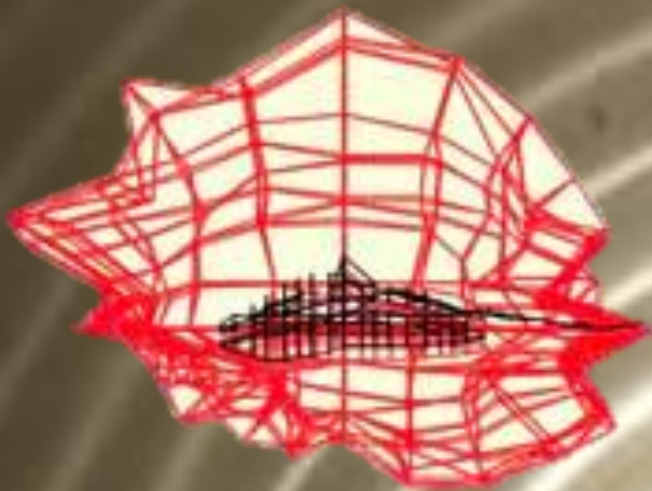
vibrations from the
 string pass to the bridge,
 the face of the violin,
 the sound post, and
 the back of the
 violin body when
 the sound





How Sound Waves are Transferred

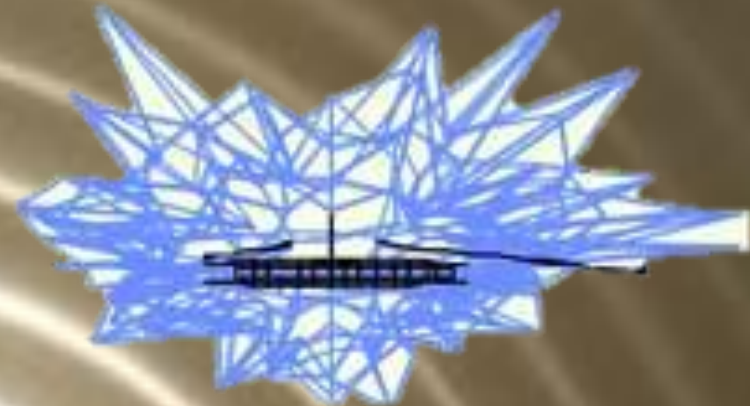
Sound Propagation



544 Hz

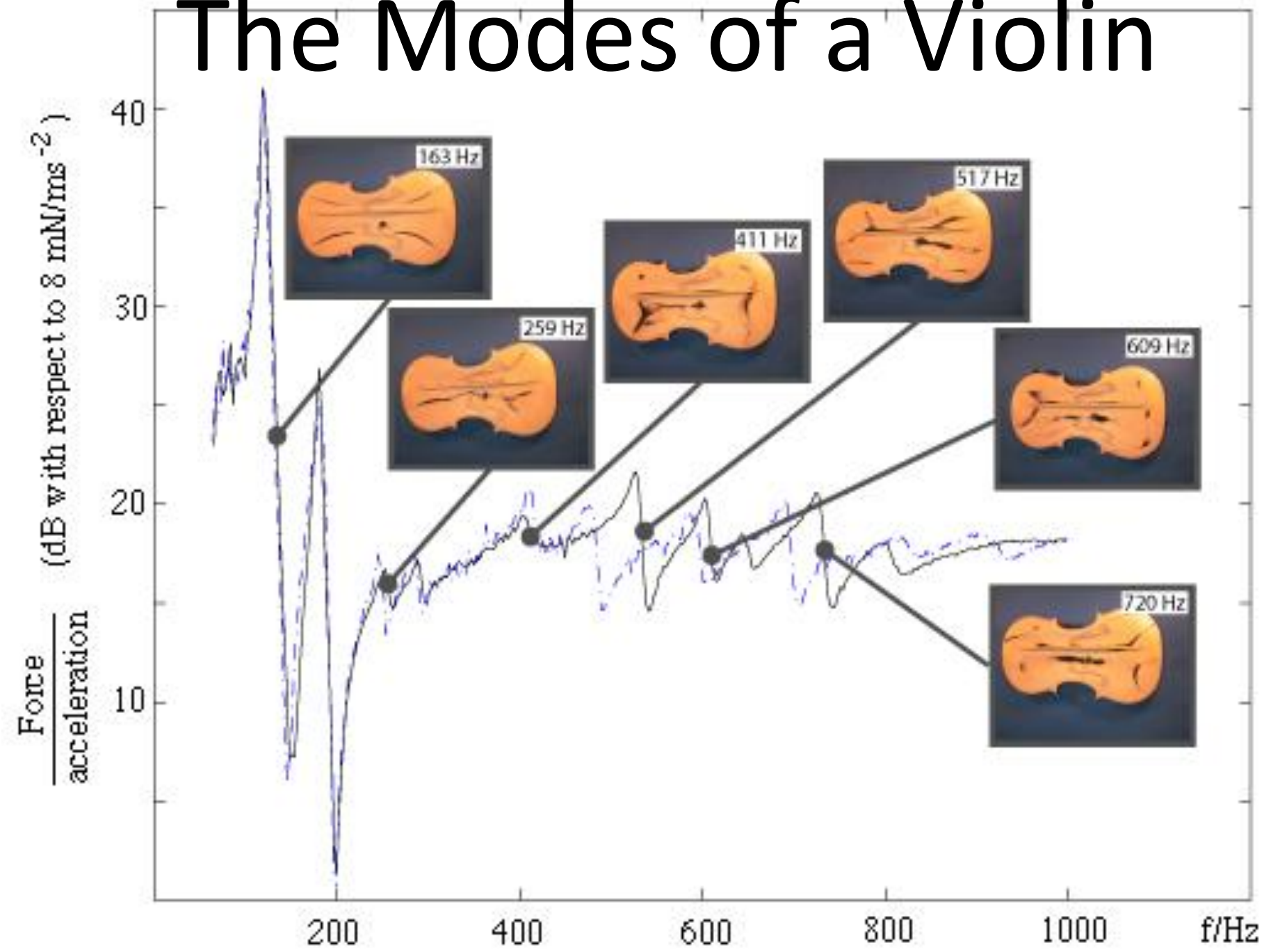


875 Hz



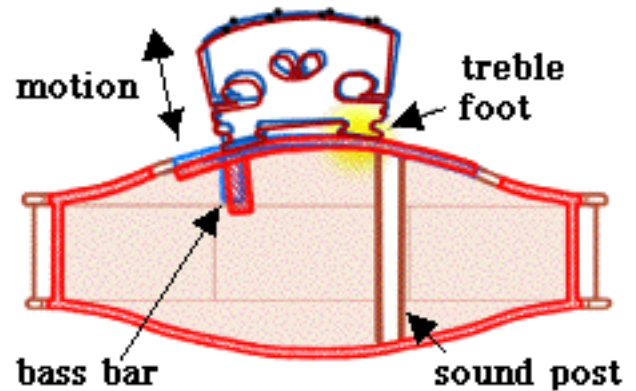
3300 Hz

The Modes of a Violin





- Height of the fin board –
- Height of the string
- Height of the bridge – pressure
- Bass bar – only essential part that has undergone major changes since Stradivari's time
- Sound post placement – tone quality
- Varnish – dampening effect



Sources

- <http://www.physicscentral.com/explore/action/fiddle-1.cfm>
- <http://www.phys.unsw.edu.au/jw/violindex.html>
- <http://woodsoundstudio.com/setup.htm>
- http://www.sprengerviolins.com/e/violin_history.htm