



# YAMAHA

## Educator Series

WIND INSTRUMENTS



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## Who Wants to Talk About Reeds?

By *Kenneth Tse*

### Introduction

Although literature on single reeds or reeds in general is not extensive, there have been quite a few scholastic books and articles published in the last century. However, some of them are either out of print or in journals – such as the Journal of the Acoustical Society of America – that are difficult to obtain or to understand for most young musicians.

Despite many guides on reeds, whether it is K. S. Jaffrey's scholarly-written treatise *Reed Mastery* in 1956 or commercially-conceived handbook "The Reed Guide" by George Kirch in 1983, single reed musicians continue to struggle and lament over their piles of cane.

"...there is nothing new under the sun," the Bible says. Indeed, many methods have been tried and re-tried. Sophisticated equipment has been developed to aid the musicians to find or create the "perfect" reed. Nonetheless, struggles remain and the subject of reeds has increasingly become, at least in the writer's experience, a taboo topic of our time.

### Brief Anatomy of Reeds

The basic material from which reeds are made is called the *Arundo donax* (or "The Great Reed"). All double reeds, single reeds, and even bagpipe reeds are made from this unique perennial grass. Mature canes have a yellowish-brown hue and are suitable for reed making. It is an extremely slow-growing grass that takes at least three to five years to become a usable cane. Perhaps because of the high demand and production schedule, some companies use immature canes for their reed products, which requires a longer storage period.

*Arundo donax's* unique textural structure consists of hard and soft fibers. The hard outer shells are composed mostly of silica, mica, manganese, magnesium and other hard elements. Secretion of wax and silica compound gives the cane its hardness and shine. Interspersed between the hard fibers are the soft spongy cells that are composed mostly of carbohydrates.

### The Function of the Reed and Its Effect in Acoustics

Being a tone generator, the reed is a very important part of the instrument – even more so than the resonator, which is the bore of the mouthpiece and the instrument. Whether the reed is balanced or not affects the vibration of the air column and hence affects the fundamental tone. Although the effects on a cylindrical bore (clarinet) might be less than a conical one (saxophone) given their acoustical differences, a poorly made or adjusted reed amplifies those effects.

Most reed instruments have the same physical phenomenon in producing sound: as air is forced through the reed, the increased airflow pulls and closes the gap between the mouthpiece and the reed and releases a burst of air into the bore of the instrument. The strength of the natural arch of the reed plus the return of the air wave reflected from the body of the instrument forces the reed to open and allows it to release another burst of air into the instrument, resulting in a valve-like function. Therefore, the quality of the reed and balance of its side rails are of utmost importance.



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## Selecting and Working with Reeds

In selecting a reed:

- It needs to have a yellowish-brown or golden color with no green (too young) or brown discolorations (too old or moldy) in the vamp.
- Straight, evenly spaced hard fibers across the tip with no blank spaces. (The function of the soft spongy soft fiber cells is to control the reed so that it will not vibrate too freely. If there is an excessive amount of hard fiber, the reed will sound harsh. On the other hand, however, if there are too many soft fiber cells [blank spaces] waterlogging can be a problem and the reed will sound dull.)
- The surface of the vamp should be smooth.
- It does not matter whether the reed has a U-shape vamp shoulder (American cut) or a horizontal vamp shoulder (French cut). But do make sure the vamp is uniformly cut; some reeds are thicker on one side.
- The butt end/heel of the reed needs to have a relatively high arch. Low arch means the reed is made from a cane that has large diameter, which will not make a good reed.
- The heart of the reed needs to show an inverted U-shape under the light. A large area of dark shadow means the reed is possibly too thick in the middle. A reed with an oddly shaped heart does not vibrate well.
- Choose the right strength: 2-2.5 for beginners and 3-3.5 for intermediate to advanced students.

In working with reeds:

- To test if a reed fits the mouthpiece properly-put the bottom hole of mouthpiece in the center of your palm and seal it properly. Suction out the air from the mouthpiece. Then quickly take the mouthpiece out of the mouth without removing it from the palm. A popping sound should occur after a few seconds; that indicates the reed is fitting properly.
- To test the balance and strength of a reed:
  - To check the balance of the sides and back of the reed, blow through each tip corner and play the middle to low register (clarinet: throat and chalumeau registers; saxophone: Bb to low Bb).
  - Check the balance of (1) and (3) [see "Parts of the reed"] using a lamp: soak a reed with water, point the reed toward the light and, watching from the butt end of the reed, push up the end tips of the reed, one side at a time, gently with the index finger. If the balance is right, the reflected light on the reed should show that both sides should bend up about the same amount. Adjust the side where it seems too hard to bend.

– If the reed is too hard-Using a reed knife or a Dutch/reed rush, scrape cane from the area (1, 2, 3, 4, 5, or 6) that is too thick (mostly 1 and 3); if both sides are balanced but lower register is hard to blow, scrape area 4, 5, or 6. Please note that adjustments in areas 2 and 5 should be minimum. Any adjustment to the tip is neither recommended nor necessary in most cases.

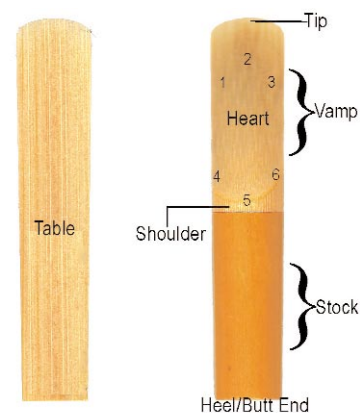
– If the reed is too soft-

Move it slightly beyond the tip of the mouthpiece and/or

Clip a small amount off the tip using a reed trimmer.

## Final notes to Band Directors

- Reeds need to be soaked thoroughly with water before playing and dried properly afterward.
- PLEASE NOTE: a warped reed does not mean it is a bad reed. It only means that the reed was dried unevenly or there are too many soft cells in the cane. Teach students to dry reeds with the table facing upward. If warped, soak the reed for a longer time until normal; there is no need to press the tip against the mouthpiece table.
- Reeds need to be stored in reed guards or other commercial holders. The author finds that a wooden box (cigar boxes for example), with its relatively constant humidity, is one of the best containers for reed guards.
- Always use a mouthpiece cap when not playing.
- Rotate at least four reeds and discard old, chipped or moldy reeds.
- The general quality of a reed has direct correlation to its price.



Parts of the reed