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Making and Adjusting the Oboe Reed

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MAKING AND ADJUSTING THE OBOE REED

by

Norma June Boyce

A report submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF MUSIC

in

Music

Approved:

UTAH STATE UNIVERSITY
Logan, Utah
1976
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N. June Boyce
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ABSTRACT

Making and Adjusting the Oboe Reed

by

N. June Boyce, Master of Music

Utah State University, 1976

Major Professor: Dr. Max F. Dalby
Department: Music

The purpose of this paper is to describe and illustrate the necessary skills in making and adjusting oboe reeds. Particular attention is given to what is known as the American scrape reed and the problems inherent in adjusting this particular reed to obtain the desired response, pitch, and tone quality. The paper also contains a listing of the necessary equipment for working on oboe reeds.

(37 pages)
INTRODUCTION

"From the standpoint of both the teacher and the student, reedmaking is a most important aspect in the pedagogy of the instrument. Over ninety percent of the world's great oboists feel that reedmaking and successful playing are inseparable. Only a few fine oboists do not make their own reeds completely, and even they do their own adjusting" (Ledet, 1961, p. 41).

The writer, after participating in several clinics and teaching privately for a number of years, has found that her greatest and most frequent task has been making and/or adjusting the reeds of students. Even though there is existing material on the subject, there seems to be a general lack of knowledge regarding reed making and adjusting. This paper contains descriptions and illustrations of the processes for successful reed making and adjustment.
A reed of good quality is an important factor in successful oboe playing. There are several types of oboe reeds. The two most common, from which the others originate, are the French and the American. The French and American reeds differ in the basic scrapes used in their construction. The French reed is characterized by a long, continuous scrape starting approximately half way down the back and getting progressively thinner from the back to the tip. It is similar to the scrape used on a single reed (Figure 1).

![Figure 1. The French scrape.](image)

The American scrape has a separate back and tip area. It can be identified by examining the back for a visual "W" scrape and a separate tip of thinner cane (Figure 2).

![Figure 2. The American scrape.](image)
The writer recommends the American scrape reed because it has been found to be the most successful in obtaining desirable timbre, pitch, flexibility of range, dynamics, and articulation. The French reed scrape, in varying climates, has a tendency to lose a desirable shape. The tip opening becomes enlarged and causes the tone to be excessively bright and penetrating. Such a reed is harder to control and forces the student to use a biting pressure rather than the rounded embouchure advocated for correct oboe playing. For these reasons the writer recommends avoiding the French scrape.

In recent years the fibercane reed has been promoted for beginning oboe students. This reed is fashioned after the American scrape. The fibercane reed has a long playing life and is not influenced by climate. For this reason it has had great appeal for students and public school teachers. There are, however, many problems inherent in the use of fibercane reeds. Some of these are:

1. Almost any embouchure will produce a sound.
2. Little or no breath support is required.
3. The pitch is inconsistent.
4. Subtle dynamic contrasts are not attainable.

Beginning oboe students may develop poor habits concerning embouchure formation and breath support if the fibercane reeds are used. The longer a student plays under these conditions the more problems he will have in transferring to the more desirable American scrape reed made of cane. The writer does not recommend the use of fibercane reeds but does suggest that a few be kept on hand for emergency use, especially on tours, where climate may affect the response of a cane reed.

The response of an oboe reed, whether it be French or American
scrape, is affected by many things -- embouchure, breath support, instrument condition, climate, etc. Because of these many variables the manufactured oboe reed is usually unsatisfactory unless properly adjusted by the student or teacher for their particular situation.
REED MAKING EQUIPMENT

The basic oboe reed making kit consists of:

- Knife (specify left or right handed) $12.50
- Mandrel 12.00
- Billot 5.00
- Plaque 1.20

Other necessary articles include:

- Staples .80 ea.
- Cane (gouged, shaped, and folded) .60 ea.
- Nylon thread (F) 2.80 (300 yds.)
- Goldbeater's skin 1.20
- Spool of #26 soft brass wire .60
- Clear fingernail polish 1.00
- Whet stone 3.50
- Single edged razor blades 1.00 (per pack)
- Small needle-nosed pliers with wire cutters 6.00

Total $48.20

(All prices approximate, June, 1975.)

Each student should be encouraged to purchase his own basic reed kit. However, the cost involved for the entire kit often has a discouraging impact upon students and parents alike. If this is the case, a proposed solution is to have the school purchase the basic kit. These articles would remain with the school to facilitate reed making for several years if properly supervised on a check-out basis.
Many professional players start the reed making process with straight cane blanks. Starting with cane blanks requires additional time and tools. The writer suggests starting with gouged, shaped, and folded cane and has found Prestini cane to be of consistently good quality. Additional information regarding reed making with straight cane blanks may be found in *The Art of Oboe Playing* by Sprenkle and Ledet, a Summy-Birchard publication.
WRAPPING

1. Prepare cane (gouged, shaped, and folded) by soaking 30-40 minutes completely immersed in cold water. If the cane is not folded, examine the bark side of the cane for a faint horizontal line and fold on the line. Soak this cane 15-20 minutes longer than prefolded cane.

2. Secure the nylon oboe thread to some stationary object (a table or desk leg, door knob, etc.).

3. Place the staple on the mandrel with the flat side of its handle in line with the wide measurement of the elliptical end of the staple.

4. Holding the mandrel and staple in the left hand (for right-handed people) and the cane (gouged, shaped, and folded) in the right hand, place the cane on the staple. The fold of the tip of the cane should correspond to the wide elliptical end of the staple (Figure 3).

Figure 3. Placing the cane on the staple.
5. Measure the length of the entire reed from the cork end of the staple to the fold on the cane. This measurement should equal 70 mm or 2 13/16 inches (Sprenkle and Ledet, 1961). There are instances, however, due to differences in oboe length, staple length, reed scrape, cane texture and width, and embouchure when the 70 mm measurement is not satisfactory. As a rule the recommended staple length is 47 mm (Andraud, 1953) leaving a cane surface of 23 mm. The writer has found it difficult to work with a surface area longer than this. Experimentation and experience often overrule the absolute 70 mm measurement, as this length may vary as much as 2 to 4 mm. The end result is to have a reed that will play to an A-440 (Westphal, 1962). Adjustment in length is achieved by moving the cane back or forward on the staple. The writer does not recommend cutting the end of the staple.

6. After establishing the reed length, examine the position of the cane on the staple for the following conditions:
   a. The vertical alignment should be straight.
   b. From a side angle the gap between the blades should be equal on both sides.
   c. Looking with the wide measurement of the elliptical staple facing you, adjust the blades until they are perfectly parallel so only the blade facing you is visible. This adjustment is necessary to avoid the slipping of blades and to prevent the escape of air from the sides of the reed.

7. While holding the cane in place on the staple, unwind approximately 12 inches of nylon thread. Stretch the thread until it is taut. Use the spool which holds the thread as a handle because the nylon thread is capable of cutting the flesh if wound around the hand or fingers.
8. Hold the flat side of the mandrel's handle parallel to the floor. This enables the wrapper to view the cane and staple relationship from the side. Place the staple and cane on the thread three to four thread widths from the small end of the staple (Figure 4).

Figure 4. Correct position for nylon.

9. Take a turn of thread around the cane and check for the equal gap between the blades on each side (Figure 5).

Figure 5. Take one turn around the cane.
10. Pull tightly. The sides of the cane should begin to close; however, a second or third turn above the first (working toward the staple's small end) is often necessary in order to close the sides completely (Figures 6 and 7).

Figure 6. Cane pulled tightly.

Figure 7. Two turns pulled tightly.
The sides should be checked after each turn to ensure their equal closure. If they are not meeting simultaneously, loosen the thread and readjust the blades. Make sure the fault is not with the amount of tension the wrapper is placing on one side rather than improper cane alignment, as either condition is a possibility. The sides should close before the binding reaches the staple end. Do not bind past the end of the staple.

There are times, due to a difference in staple length or cane width, that the sides will not close. In the event that this condition occurs, loosen the thread and place the cane from 1 to 2 mm further down the staple toward the cork. If the cane appears to be overlapping after only one turn, take the opposite action.

11. Once the sides are closed, cross over the three or four turns already made and proceed to wrap down the staple toward the cork (Figures 8 and 9).

Figure 8. Crossing over.
Figure 9. Wrapping to the cork.

Maintain tension in the thread. The thread extending from the stationary object serves as a guide line. It will be underneath the scraping. Wrap to the cork.

12. Turn the mandrel in a vertical position and check again for equal blade closure, vertical alignment, and length. Readjust if necessary.

13. Unroll 8 to 10 inches of thread from the spool and form a loop beneath the thread extending from the stationary object. Put the spool over the top of that line and pull it back through the loop. Pull the knot up tightly and repeat the process a second time.

14. Cut all connecting threads and coat the thread wrapping with clear fingernail polish.

15. Let the reed dry at least 24 hours before attempting to scrape. This ensures blade sealing and helps to avoid blade slipping.
KNIFE SHARPENING

Failure at reed making can often be attributed to a dull knife, which causes shredding and tearing of cane. The knife should be sharpened on a lubricated whet stone. The stone should be lubricated with a light-weight oil (sewing machine oil). The knife's cutting edge, the side facing the reed tip when scraping, is the first to be sharpened. This is done by laying that side on the stone and moving the knife in a circular motion (Figure 10).

![Figure 10. Sharpening the cutting edge.](image)

The knife is then turned over on the other side and drawn sharply across and off the stone (Figure 11).

![Figure 11. Putting a spur on the knife.](image)
This motion produces the necessary spur on the cutting edge of the beveled-type. The writer has found this type of knife to be superior to the other available types. The knife should be sharpened prior to scraping and perhaps twice or three times during the scraping process. A new knife may need to be sharpened more frequently until a cutting edge is established. A sharp knife is capable of cutting the thumbnail when drawn across it.
SCRAPING AND ADJUSTING

The actual scraping process is done by holding the knife in the right hand (for right-handed people) and holding the reed on the mandrel in the left. The mandrel lies cradled across the palm of the hand with its handle resting on the heel of the hand. The fingers are curved and relaxed. The left index finger is curved so that the pad of the finger is resting in back of the cane being scraped. Avoid a contorted body position. Try to sit back rather than slumping over the reed, as this position cuts off light and causes tired muscles.

When scraping, the left thumb serves as a pivotal point for the top of the knife blade. The knife is not pushed by the right thumb but rather is worked by rotation of the right wrist and pivots off the left thumb. This motion avoids undue pressure on the reed which would cause cracking and gouging in the cane surface. The knife scrapes in one direction only -- toward the reed tip.

Areas of the Reed

Before scraping it is necessary to identify the areas of the reed that will be referred to in the scraping process (Figure 12).
Figure 12. Areas of the reed.
The half moon tip

1. Soak the reed in clear water 3 to 5 minutes prior to scraping and keep the reed moist throughout the entire process to avoid cracking, tearing, or chipping.

2. Establish the reed's "heart." It will be an imaginary spot located 6mm or 1/4 inch back of the reed tip edge in the center of the reed's width.

3. Using the "heart" as a reference point, construct a half moon tip (Figure 13).

![Heart and half moon tip](image)

Figure 13. Heart and half moon tip.

This is accomplished by starting the scrape in the center of the imaginary "X" representing the heart. The right side of the half moon is scraped with the knife handle down with the blade moving to the right corner. Each stroke starts from the heart and ends past the reed tip.

4. Both blades must be identical. It is necessary to have equal tip length and parallel hearts. The beginning reed maker may want to draw an outline with pencil on the cane surface before scraping. Each step is completed on both blades before moving on.
The back

Construct a "W" scraped back 13mm long by starting the knife 13/16 inches or 4mm from the thread and scraping toward the reed tip. The stroke lasts until the back of the half moon tip is met. Be aware of cane on the remaining backbone and ribs (Figure 14).

Figure 14. The back ("W" scrape, backbone, and ribs).

The tip opening

After the back on both blades has been completed, the reed tip may be opened by inserting a single-edged razor blade between the blades and pulling it up and through the tip. (Remember the cane should remain moist.) If the reed tip appears ragged, place the reed tip on a billot and trim the very edge of the tip (less than a millimeter if possible). This process is done with a single-edged razor blade, not the reed knife. Rock the razor blade back and forth across the tip. Pulling the blade across the tip causes tip shredding. There are many times when this trimming is not necessary if the tip has been opened with a sharp razor blade.

Reed Testing Based on the Double Crow

It is unusual for a reed to respond properly at this stage due to the thickness of the remaining cane. However, the reed may and should be
tested by forming the proper embouchure, inserting the reed in the mouth almost to the thread and blowing through the reed. The desired response is a double crow consisting of an octave. The lower octave pitch within the crow comes from vibrations in the back of the reed and the high pitch from vibrations in the tip. The octave consists of vibrations of 247 and 494 per second and will sound an approximate written B on the piano. A crow is a direct reflection of the reed's efficiency.

For further adjustment a plaque should be inserted between the blades during all scraping. This helps to prevent cracking as well as provides a backing to gauge cane thickness.

**Adjustment on the basis of the double crow**

Absence of a crow indicates thickness and resistance in all areas of the reed. The two most commonly needed adjustments are thinning of back and tip.

1. Thinning the back:
   a. The bark should be removed from the backbone and the heart area. The backbone becomes a hump as the entire back is rounded and smoothed in this fashion ( ). The backbone is still elevated and maintains prominence. There are no ridges between the backbone and the "W" scrape.
   b. There should be no ridges separating the back from the lay or the lay from the tip. Any ridges in the cane inhibit continued vibration of the reed. Ridges are removed by approaching the ridge from the opposite angle which produced it. If a ridge or gouge is found within the "W" scrape or separating the back from the lay, work from the backbone or
heart out to the edge, treating the knife as if it were sandpaper. The use of dried joint grass is also helpful. Retain the ribs at all times.

2. Thinning the tip:
   a. Thin the tip by scraping straight off from the point where the half moon tip meets the sides of the reed (Figure 15).

   ![Figure 15. Thinning the tip.](image)

   This process creates a thin tip of 3mm and produces a gradual slope from the heart to the tip of the reed.
   b. At this point count strokes and take the same amount off each blade.
   c. Retest for the double crow. Beginning reed makers seldom take off enough cane. If the reed is still unresponsive, repeat the two processes.

Physical properties affecting the double crow

It is necessary to have knowledge of some of the physical properties of sound production and their relationship to the reed. The pitch of a note is determined by the number of vibrations produced per second. The faster the vibrating frequency, the higher the pitch; the slower the
vibrating frequency, the lower the pitch. The tip of the reed is the thinnest area of the reed and therefore has the ability to vibrate faster than any other area. Hence, the high range and crows are controlled by the reed tip and the low crows and low range are controlled by the back of the reed because of its slower vibrating surface.

If the reed responds with only a high crow, the tip is the only area vibrating. Possible solutions for the problem are:

1. check for any ridges between the lay and the back, as they will stop vibrations from extending into the back (Figure 16 a);

2. thin the back further, as it may be too thick to respond. Keep
the proper smooth humped relationship with the backbone and "W" scraped back (\(\wedge\)) (Figure 16 b);

3. thin the lay, working around the heart. This action will allow more vibrations to extend from the tip down through the back (Figure 16 c);

4. thin the tip back into the half moon tip, as if you were creating a backward half moon. The tip will appear straight across. The heart remains always. This also allows for vibrations to pass more easily into the back (Figure 16 d).

A low, blatty quality in the crow indicates that too much cane has been removed from the lay or the heart, or that the tip is too long and/or thin. A solution is to cut the tip slightly. Shortening the tip will "add cane" to the heart and lay by changing their relationship to the other areas of the reed.

A stiff, harsh crow indicates too much resistance in the tip of the reed. Thin the tip as directed in Figures 15 and 16 d.

Adjusting the tip opening

It may be difficult to produce the appropriate crow due to an improper tip opening. An opening that is too large will result in a loud, raucous crow. It shows much resistance and takes biting pressure and much air to produce at all. An opening that is too small will cause a thin crow and one which will collapse after being sustained for any length of time. Depending upon the problem, squeeze the opening closed or open with the fingers first. If this helps, you have isolated the problem and should, if possible, wait 24 hours, allowing the cane to dry. This waiting period is important because soaking causes the cane fibers to swell whereas drying causes the fibers to shrink. This shrinkage may close the tip opening...
slightly, depending upon the cane. Some cane tends to "pick up cane" after the second soaking and may open further when it has been closed too much earlier.

If a reed has a problem with response at this point, either because of scrape or tip opening, do not become anxious. The reed will be much more stable if final adjustments are made at least 24 hours after the initial scrapes are established.

A reed tip may also expand due to over-soaking just prior to use or a combination of soaking and pulling air through the reed by sucking on it for an excessive amount of time. If this is a possibility, compress the tip gently between the fingers for a short period of time before adjusting.

After the second soaking, drying, and testing if the tip opening is still troublesome it may be adjusted with a #26 brass wire. Cut approximately 2½ inches of wire, place the wire on the reed just beneath the "W" scrape and take 2 turns around the reed (Figure 17).

![Figure 17. Wire placement on the reed.](image)

Connect the two wire ends with a pair of needle-nosed pliers by twisting them together while pulling them away from the reed to ensure tightness. If the tip opening is too small, put pressure on the wire from the sides of the reed. If the tip opening is too large, put pressure
on the front of the wire and squeeze the two blades together.

**Use of goldbeater's skin**

Check both sides of the reed for any opening between the blades. A gap could be present due to a partial removal of a rib, a wide tip, or poor wrapping. Often a small leak will be present and yet not visible. This possibility may be checked by placing a finger over the tube opening and blowing through the reed, listening for air leaks. If a leak exists, cut a piece of goldbeater's skin \( \frac{1}{2} \) inch wide and 1\( \frac{1}{2} \) inches long. The sheet should be cut with one end slanted (Figure 18).

![Figure 18. Cutting the goldbeater's skin.](image)

Wet the straight end slightly and place it approximately \( \frac{1}{8} \) inch on the thread wrapping. Wrap the skin up the wet cane. It serves as an airtight seal.

**Adjustment Based on the Response of the Reed on the Oboe**

Once the desired double crow is achieved the reed should be tested on the oboe.

**Range**

Check the reed for flexibility of range. The low range is controlled by the back of the reed and the high range by the reed tip. This corresponds to the double crow and the same adjustments will work for both.
For instance, poor response in the low range indicates resistance in the back of the reed and the suggestions found on page 22 and in Figure 16 for poor low crow response will be applicable.

Tone quality

Just as different areas of the reed affect the range they also affect the basic tone quality. The back of the reed controls the dark tone qualities and the tip controls the bright qualities.

A reed with a bright, nasal quality may be darkened in two ways.

1. Shave cane from the back of the "W" scrape (Figure 19).

![Figure 19. Darkening the tone quality.](image)

This scrape allows the back to vibrate with less resistance. The darker qualities released in the back are then in better balance with the bright qualities being released by the tip. The scrape also affects the lay, heart, and tip by making them proportionately thicker. "If wood is scraped from one area, the others, by comparison, are left thicker. This is a valuable concept when one wishes to "add" more wood to a particular spot" (Sprenkle and Ledet, 1961).
2. Cut the tip slightly. This eliminates some of the area, releasing bright qualities, and the tip is typically thicker when approaching the heart. This added thickness gives the reed a darker quality.

**Unresponsive, sluggish, or small dynamic contrast**

If a reed is unresponsive, sluggish, or has a small dynamic contrast, it has far too much resistance. This may be lessened by:

1. Thinning the entire area, as the reed could be too thick all over.
2. Lengthening the lay by working the tip back in a backward half moon fashion as discussed earlier (see Figure 16 d, page 22). 
3. Thin the tip allowing more bright vibrations to escape (see Figure 15, page 21).
4. Dynamic contrast is controlled for the most part by the tip opening. The larger opening gives greater volume; a smaller opening gives less volume. Guard against the opening that is too large as it causes increased embouchure strain in order to begin and release softly.

**Tonguing**

Problems concerning tonguing are almost always associated with the tip area. If the tonguing response is slow and hard, thin the tip slightly. If the response is bright or chirpy, cut the tip slightly.

**Pitch**

The oboist must rely strictly upon the pitch of the reed. The oboe may not be lengthened at the joint connection. The cork of the staple should be placed as far in the oboe as possible. Pitch adjustment may
not be made by pulling the staple out, as this upsets the intonation within the instrument itself. However, slight sharpness of pitch, in emergency situations, may be remedied by pulling the staple slightly. The writer does not recommend cutting staples to eliminate flatness of pitch.

The pitch of the reed can be affected by the following conditions;

1. The overall length: the longer the reed the lower the pitch. The shorter the reed the higher the pitch.

2. The cane width: a wide shape causes a lower pitch. A narrow width causes a higher pitch.

3. The size of the tip opening: the smaller the tip opening the higher the pitch. The wider the opening, the lower the pitch.

4. The scrape: a long tip, a thin lay, or taking too much cane from the heart or out of the backbone all produce a lower pitch.

Various ways in which the pitch of an existing reed can be adjusted. If a reed is flat it may be adjusted by;

1. Cutting the tip.

2. Closing the tip opening.

If a reed is sharp it may be adjusted by:

1. Thinning the tip.

2. Thinning the lay and lengthening it.

3. Thinning the backbone and/or heart.

4. Opening the tip.

Remember, anything done to one area of the reed will create a different relationship within the entire reed. For example, if the pitch of the reed is flat but the reed responds well, the writer recommends cutting the tip. However, by cutting the tip, many times the tip
opening is increased. This keeps the reed equally flat and often makes the response hard and brash. The solution, then, is to close the tip opening, making the pitch rise and the response easier to control with a relaxed embouchure.

Improving pitch that is consistently poor. If your reeds are consistently flat, make the following alterations:

1. Narrow the shape of the cane by shaving the sides of the cane slightly before wrapping.
2. Wrap the entire reed shorter.
3. Scrape less cane off the lay, heart, and backbone.

If your reeds are consistently sharp, make these alterations:

1. Use wider shaped cane.
2. Wrap the entire reed longer.
SUMMARY

1. Both blades must be identical. Anything done to one side must be done to the other.

2. All areas of the reed must be in proportion to each other -- by scraping the tip you also affect the back, lay, and heart.

3. Keep your mind open to all alternatives when seeking a solution.

4. The reed adjusting process lasts throughout the life of the reed. Allow adequate time before rehearsals and performances to prepare the reed and adjust it if necessary.

5. Reed making is expensive, time-consuming, and many times frustrating, but always essential.

BIBLIOGRAPHY


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