

Bronze Casting with The Lost Wax Method

---

A Thesis

Presented to

the Chancellor's Scholars Council of  
The University of North Carolina at Pembroke

---

In Partial Fulfillment  
of the Requirements for Completion of  
the Chancellor's Scholars Program

---

by

Kris Williams

April 25th, 1999

Faculty Advisor's Approval



Date

April 26, 1999

00291609

Cage  
AS  
36  
Nb  
P455  
1999  
ND.4

The original plan was to create a sculptural form that would be done in a commission-like manner. Artists have been commissioned to complete works since, and even before, the Renaissance. Commissions are usually awarded on the merit of the particular artist with concern to the final product that the commissioning party has envisioned. Commissions range from paintings to sculpture. Before and during the Renaissance, commissions were usually given to artists to complete religious works to be placed in churches. This is not quite as popular today although commissions are still made. A more pertinent term today would be a grant. The major difference is that today's grants are often appropriated by governmental moneys (i.e. tax dollars) and such.

I intended to shop the idea around to community members that might be interested in having the sculpture installed in a public place and helping to fund it. Now I realize that the latter part of this plan was not well laid out. In actuality, this does not even qualify as a commission; a commission would involve a benefactor with an idea contacting an artist to bring that idea to life. With this plan of mine, I had to search for interested parties and then sell the idea and the financial situation.

My list of potential benefactors grew as the project progressed. I originally designed the piece with my alma mater in mind, Scotland High School. While studying the form of the bagpipe at the Scottish Heritage Center of St. Andrews College (also in Laurinburg), the director of the center showed some interest in the sculpture. That was my second possible source. The third came when a friend of mine became very closely associated with The Scotland County Arts Council. However, as time went by it became very apparent that it would take at least a couple more years of lobbying to get people interested in having this piece installed. I remained determined to finish the piece. I never became discouraged at the lack of interest because I wasn't

simply making the piece exclusively for it to be installed. The idea of the piece went much further than that. Most of my sculptural work in some way refers to my life. I call these pieces "icons" because they are symbolic of grouped events and feelings deeply rooted within my personal life.

My original vision stemmed from my days at Scotland High School and playing football there. As a graduate of Scotland High School and having lived in the area all my life, I know the emphasis placed on the Scottish heritage that many people share. I also know the great love for the high school football team, The Fighting Scots, since I am a former member of that team. It is still my wish to give something back to this community for all the support it gives to the high school and the football program. The bronze form I created is a life-size set of bagpipes that was intended to be placed on a pedestal at the Pate Stadium field house, home to The Fighting Scots of Scotland High School. Anywhere on campus would be acceptable in my mind even though I wanted to see it in the stadium at first.

I originally had an idea to create and complete a human form in Scottish dress. Since then, however, I realized that not only were the bagpipes more economical, but the bagpipes are very representative of Scottish heritage. The bagpipes may be the only thing more Scottish than a kilt. The bronze form itself was created through the involved process of the Lost Wax Method. Bronze lasts basically forever (unless someone intentionally sets out to destroy it), therefore, it was a perfect choice for this sculpture. Where to place the sculpture, how to present it, and the overall aesthetics of the piece were the major design considerations at hand.

Part of my inspiration for this project (when connected with my alma mater) came from a tradition that many teams employ. The Clemson Tigers are probably the best known program that utilizes this tradition. They have a special rock that every member of the team touches on his way to the field at game time. Recently, I saw The Maryland Terrapins playing on television and

noticed a life size tortoise or terrapin of bronze resting on a brick pedestal. Once again, each member touched it. At the high school level, the arch rival of Scotland High, Richmond Senior High School, has a large rock with an R painted on it to employ this old tradition. It should be indicated that this tradition is not executed out of superstition (for the most part), but out of a desire for focus. Successful athletic teams usually have great focus. Also playing a very important role in the inspiration for this project is my experience with the medium in sculpture class from the Spring '97 semester through this semester, Spring '99, and talks with my advisors.

Having said that the bagpipe is probably more Scottish than anything else in the world, many people probably believe that the bagpipe was invented in Scotland. While I had some idea that the instrument had origins elsewhere, I did not realize that the use of the bagpipe was quite widespread across Europe and Asia at one time. According to Seamus MacNeill and Frank Richardson, the bagpipe can be traced back to Babylon in the times of Nebudchadnezzar. MacNeill and Richardson say that "In verses 4 and 5 of chapter 3" in The Book of Daniel from the Bible, the word "dulcimer" translates to the early bagpipe (9). According to Francis Collinson, the pipes used before the Romans were probably double-pipes blown by mouth. They were "in use for nearly three thousand years before the bag was invented" (1). The first documented mention of the true bagpipe (bag included) comes from a proclamation made by the Roman Emperor Nero "sometime in the second half of the first century AD" (44). According to MacNeill and Richardson, the early bagpipe may have been invented in some areas independently, but the instrument probably spread through Roman trade and entertainment, or directly through the spread of the Roman Empire (6). The bagpipe spread so much that "today there are pipers in England, Ireland, France, Italy, Spain, Yugoslavia, Poland, Russia, Czechoslovakia - all playing their own native form of the bagpipe" (MacNeill & Richardson 7). Those who may incorrectly

believe that the bagpipe was invented in Scotland have a good excuse however. MacNeill and Richardson not only justify my reasoning for selecting the bagpipe as the subject of this sculpture, but say it best when they say, "Out of all the countries of Europe and Asia, one only kept its bagpipe unchanged, unaffected by foreign influence; undiminished in power and loudness; unconcerned with sweetness, delicacy and drawing-rooms; an instrument totally, gloriously and irrevocably dedicated to the open air - the Great Highland bagpipe of the Scottish Gael" (9).

The bagpipe that has survived and become the most popular is the "piob mhor or 'great pipe'" of the Scots (MacNeill & Richardson 10). This piob mhor consists of a covered bag, a blowpipe, a chanter, two tenor drones, and a bass drone (Cannon 11). In my search to find a model for my sculpture I went to The Scottish Heritage Center at St. Andrew's Presbyterian College. The center was established to highlight and preserve the Scottish traditions of the Carolinas and beyond. I sought out the help of the center's director, Mr. Bill Caudill, in hopes of remaining true to the last detail in my depiction of the bagpipe. Mr. Caudill was kind enough to allow me to study his own personal bagpipe and photograph it. He also pointed out details of the instrument that I would not have known otherwise. It was a beautiful instrument which he explained was over 40 years old and crafted with African Blackwood, ivory, and silver. The bag cover was made of black corduroy which, as Mr. Caudill explained, allowed better grip when the instrument is held between the elbow and the body.

At the time I was meeting with Mr. Caudill, I estimated the cost of my sculpture to be much greater than it would turn out to be. I had to purchase the raw bronze metal for the eventual casting and I really had no way of coming up with a reliable estimated cost. So I began to think of some ways to fuse the metal with other components, especially wood. I thought that I might use wood in my sculpture where there was wood in the drones of the real instrument. I have always

thought that a bronze piece is much more interesting when combined with other components anyway. So I then had to figure out how to make those wooden parts. I could not turn them because I do not have experience in wood turning. Therefore, I began brainstorming for some material that I could find already shaped. This went on for at least 24 hours when I found myself staring at the banister on the stairs at home. Suddenly I realized that the spindles had the shapes that I needed and wanted. It was an epiphany. I wanted to use the spindle shapes in the drones of the bagpipe. Later, I decided that instead of using the actual wood in the final piece, I would make plaster molds of the spindle pieces (and table leg pieces if the truth be known) to create the wax forms used in The Lost Wax Method.

I have assisted in many casting pours to date at the request of the professor (who happens to be my advisor on this project), Mr. Paul Van Zandt. The process of bronze casting consists of seven basic steps. First, a piece is made from clay or a found object of some interest is acquired (a found object is simply an object picked up and not made by the artist). Second, a plaster mold is made of the piece or object. Third, the piece or object is removed and the artist is left with a negative mold. Molten wax is poured into the mold and forms a layer around the outside of the negative space within the mold (the center remains hollow). Fourth, after the wax has been molded and finished to the artist's specifications, core pins are pushed through the outside of the wax layer; half of the pin is left outside and half of the pin is left inside the hollow center. A cement-like mixture called investment is poured inside the wax form and then the wax form is put into a mold of investment. Fifth, the mold is put into a kiln and the wax is burned out (the idea of the core pins is to preserve the thin layer of wax; the pins hold the investment inside and outside the wax form in place after the wax is removed). The sixth step is the most exciting. At this time the molten bronze (which is at 2000 degrees Fahrenheit) is poured into the molds. The bronze



takes the place that the wax once held. After the bronze has cooled, the molds are broken and the bronze pieces are removed. The seventh step is to smooth and finish the bronze piece and then patina (or color) the surface.

Besides the spindle pieces and table leg pieces, another plaster mold was made of a candle to be used as the chanter and mouthpiece. For the bag form, I used a towel shaped with duct tape and filled with sand to mold hot, but solid, wax around.

The reason that I strove for such detail in the sculpted bagpipe was partly an aesthetic choice of my own, but mostly a conscious decision to appeal to the "commissioning" process. The majority of the public is not satisfied with art if it is not directly representational in some way. It does not want to have to think about what it is looking at. Therefore, I attempted to bridge that gap. It was my intention to create a piece with an aesthetic that I could truly say was my own (and that I could live with) while, at the same time, making it appealing to the mainstream viewer.

As an overall design, my sculpture changed several times. Originally, I intended for the base of my sculpture to be a whole stump, complete with it's roots (or at least most of them) and a substantial amount of tree left attached. I even made a small bronze maquette initially with a true stump (roots and all). After much thought I realized that the weight of the stump would be far too much for normal transportation. So I decided to use a short stump with it's roots still attached rather than a stump with roots and pine log still attached. On this second design, I thought about building a cylinder (empty on the inside) of small pine logs and placing this on top of the short stump. This cylinder would have taken the place of the large pine tree that would have been attached to the stump before it was cut down. All along I had flirted with the idea of using one large pine log sitting atop a base made of some other material. This design became my

official design for some time. The final decision to go with the large pine log without roots came with the availability of a pine log directly from Cross Creek Presbyterian Church in Fayetteville. I intended to sit the log on top of a cement base (Appendix A), but I was never really satisfied with cement as the right material or a shape for the base. So when the bronze bagpipe was done and it was time to make the base, I chose to combine a couple of my ideas. I decided to use just the one large log, but I quartered it with a chain saw and arranged the pieces much like the idea I had with many smaller logs (Appendix B). I decided to leave the log as the only base.

It is important to understand that making art is an ongoing process that requires problem solving skills at every turn. I had many ideas for the base and the bagpipe, but only about four or five made it to serious consideration. As I said, art-making is an ongoing process and I always look forward to every peak and valley of the creative problem solving process.

To be completely honest, I must admit that when I was told I needed to begin a project a full year and a half in advance, I was almost offended. It is my nature to put things off until the last minute. Now this is naturally a little harrowing, but the job always gets done. I thrive on the immediacy of my work. I cannot say for sure, but I am almost certain that this stems from my artistic nature. Not to say that this manifests itself this way in all artists, but I consider myself somewhat of a romantic when it comes to my own artwork. This also applies to my writing. I have always written in a lump session. I find it to be a great way to get all my thoughts out and synthesized at once. Of course, I have been thinking about what I'm going to write for days, just as I think about what imagery I want to include in a piece of my artwork. Obviously, for longer papers and artwork, it takes a series of these lump sessions to flesh out and complete them. For some time during the final stages of the preparation for the casting of the bagpipe, I lost interest in the piece. I had to force myself to work on it at times. Making art has an immediacy factor built



in. The idea has to be fleshed out while work is being done on the actual piece. And after only taking a couple breaks to step back and see what needs to be added or taken away, it is over. This is when being an artist feels the best. Eventually, I was able to recapture my enthusiasm for the bagpipe piece. When the casting was done and the grinding and welding was finished it was time for the patina. The patina is almost a magical thing. When it is done right and wax is applied, the bronze piece can take on a whole new life. That is what happened for the bagpipe and I. The patina can also unify a piece; it pulls welded parts together and distracts the eye from the ugly places so the entire piece can be seen.

Another factor that rejuvenated my interest in the bagpipe was the work on the base. I had purposely separated the making of the base from the making of the bagpipe. Mostly, it was a consideration for time, but in the end it was exactly what I needed to get me back on track with the piece as a whole.

Although I changed my major to Art Studio from Art Education during this project, my goal has always been the same: to make my art. I had not done such a large scale cast piece until this one. Now I know what it takes.

There are two basic categories of art: art created purely for personal consumption and/or gratification, and art created for public and/or a private party's consumption or gratification. I personally have experienced the former category of art all my life. I have always created works basically for my own consumption and gratification. This was my first attempt at the latter. Although I did not find a party willing to take the piece, I was amazed at the fact that every single person that attended my senior art show knew what the sculpture was when they saw it. They may have not known the personal details of my life riding behind it, but the unique instrument made its presence known.

This has been a great experience and addition to my portfolio. I have learned many lessons about myself as an artist and the art-making process in general during this project. I have to thank the Chancellor's Scholars Program for the opportunity, God for my ability, my family for their support, and the Art Department and its distinguished professors, especially Mr. Paul Van Zandt, for opening the doors and pushing me in.

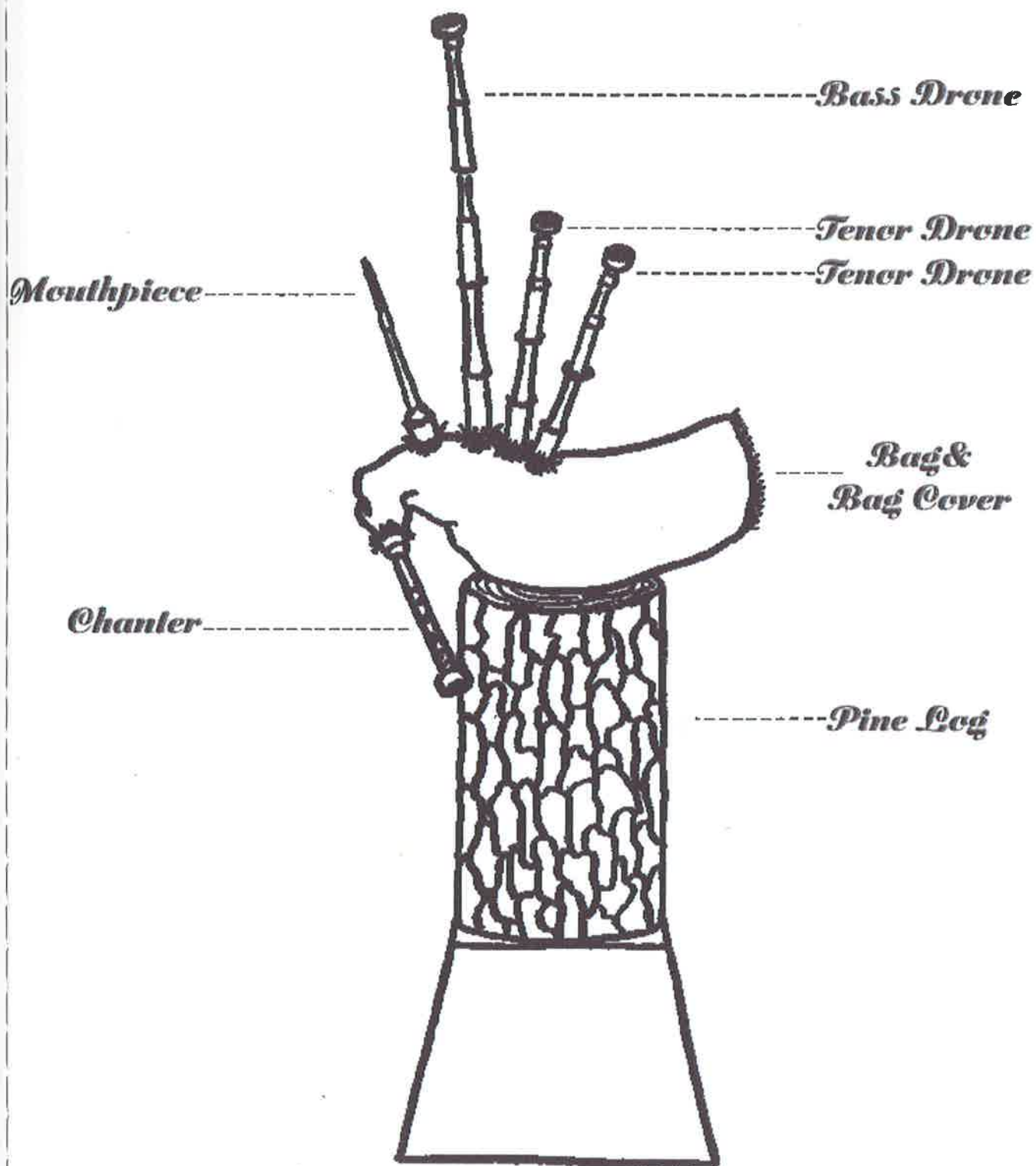
### Works Cited

Cannon, Roderick D. The Highland Bagpipe and its Music. Edinburgh: John Donald Publishers Ltd., 1988.

Collinson, Francis. The Bagpipe: The history of a musical instrument. London: Routledge and Kegan Paul, 1975.

MacNeill, Seamus and Frank Richardson. Piobaireachd and its Interpretation. Edinburgh: John Donald Publishers Ltd., 1987.

## Appendix A



## Appendix B

