

**M**etal artifacts are perhaps the most difficult artifacts to identify from archaeological sites. A wide range of hardware, tools, containers, implements, and accoutrements were made of various kinds of metals, and while the whole artifact might be readily identifiable, archaeologists generally recover only the bits and pieces whose identification is a daunting task. The identification of fragmentary remains is challenge enough for archaeologists, but the

## Conservation and Identification of Metal Artifacts from Los Adaes

By  
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(with George Avery)

unstable nature of the metal—especially the iron-containing or ferruginous metals—requires special treatment—or conservation—to ensure that the metal fragments are not reduced to a pile of rust after they are removed from the ground.

Metal conservation should now be a regular part of any historical archaeology excavation, and several universities are steadily producing archaeology students proficient in the conservation of metals from archaeological sites. But when Dr. Gregory conducted the first professional excavations at Los Adaes over thirty years ago, metal conservators were simply not readily available. Dr. Gregory relied on the volunteered services

of Jay C. Blaine—a member of the Texas Archaeological Society—for the conservation and identification of metal artifacts recovered from Los Adaes excavations during the 1960s, '70s, and '80s.<sup>1</sup> Jay C. Blaine is self-taught<sup>2</sup> and is undeniably the foremost authority on colonial period metal artifacts recovered from archaeological sites in Texas, Oklahoma, and Louisiana.

Mr. Blaine has been involved with numerous archaeological projects—both historic and prehistoric—over the past 40 years in Texas, Louisiana, and Oklahoma. His interpretations of metal artifacts have been included in over 30 publications; he has written book reviews for the Society for Historical Archeology; he has served as president for the Dallas Archaeological Society (1964-65) and the Texas Archeology Society (1971); he was elected Fellow of the Texas Archeological Society in 1989; he is a member of the Texas Archeological Stewardship Network, and in 1993 he received the Texas Historical Commission's Award of Excellence in Archeology—Archeological Preservation. Mr. Blaine's recent activities, aside from his work with the Los Adaes materials, include consultation with the excavation and interpretation of a probable Coronado camp site, and conservation and interpretation of hardware from an Afro-American 19th century casket from a cemetery in the Dallas, Texas area.

In the interview that follows,<sup>3</sup> Mr. Blaine talks about how he got into archaeology, metal conservation, and metal artifact identification. He discusses some of the many challenges of both metal conservation and artifact identification, and he emphasizes that a metal conservator must also be well versed in artifact identification. Mr. Blaine's work has contributed significantly to the understanding of Los Adaes and he shares his interpretation of the 18th century fire arms and horse gear recovered from Los Adaes.

**George Avery:** How did you get interested in archaeology?

**Jay Blaine:** I spotted a couple of publications from the Texas Archaeological Society (TAS) while I was visiting a Museum in West Texas, and I read some of the contents, and it sounded like it would be a real interesting thing to get into. Some of the material was being submitted by non-professional archaeologists and that encouraged me to think there might be something in it that I would enjoy doing. I didn't even know there was a TAS before I saw those two publications.

**George:** When was this—what year?

**Jay:** This would be about 1960. Prior to that time I was interested in what some folks would call archaeology, but I didn't know it at the time. When California celebrated their centennial (1949), I was interested in reading all the details about the troubles that the wagon trains had when they were coming to California, especially just to our east in Nevada (I was in California at that time). And I thought I would like to go and trace out some of those wagon routes. There were places along the highway where a sign would mark where the immigrant trail crossed, here and there. Pioneer diaries spent a lot of time explaining the difficulties they had crossing the last 40 miles of desert in Nevada in the 1840s. So, I thought, well—I'll go out there and look for the trail, and I was appalled to find remains of wagons everywhere. Nobody had bothered to pick up these remains—they were laying right on the surface.

These wagons were different than what we normally think of as wagons these days. These were all linch pin wagons, the wheels weren't held on by nuts, they were held on by linch pins. And I could tell that the wagon hardware was handwrought, as opposed to machine manufactured. I started making a systematic surface collection of that material, and subsequently donated a good deal of it to the San Joaquin Pioneer Museum in Stockton, California. The curator there was glad to get it because they didn't have comparative material from that time. They had things like wagons that someone had given to them whose grandfather or great grandfather had supposedly brought across in 1849 or 1850, but the problem was that grandfather might well have bought that wagon *after* he got to California. So the curator was very interested in the wagon hardware that I was bringing in from the desert, and comparing it to what they had on relatively intact donated wagons.

Anyway, I was already interested in that sort of thing, and when I saw these two TAS Bulletins, I thought I'd like to know something more about it, but I let it kind of slide. Then came a newspaper article in the *Dallas Morning News* about the Dallas Archaeological Society. It mentioned that they were working together with professionals on archaeology in the Lake Whitney region, and gave the names of some of the Dallas people who were involved, one of whom was a book seller—

Lloyd Harper. And since he had a business address, I called on the telephone, and his wife was extremely courteous and enthusiastic, and wanted me to come around and join the group—or see the group—which I then did. It was a small, informal group—they met at different member's houses through the year. They were very friendly—they would look you over, for about three months—and one of them would be assigned to judge just how much you were into it, whether you were willing to spend the time to go over the literature, and that sort of thing. And then, after about three meetings, if you seemed that you wouldn't be too disruptive, ☺<sup>4</sup> they would ask you if you wanted to join, which I did.

Shortly thereafter, 1962, the University of Texas came up to north Texas to investigate a site that came to be known as the Gilbert Site. The Gilbert Site was the first sort of field school for the TAS which included both professionals and non-professionals. The Dallas Archaeological Society and the Tarrant County Archaeological Society formed most of the amateur contribution, the rest of the personnel were from the University of Texas.

We didn't realize it at the time, but the Gilbert Site would turn out to be the most prolific in terms of 18th century trade-associated material culture of any site that we've dug since. It was just absolutely loaded with apparently French trade material. We couldn't identify it as French at the time, because it didn't say "France" on the various pieces, but it was certainly oriented toward the French trade in the time period involved. One of the artifacts that initially helped date the site was a French coin dated 1759 that was virtually unworn, and had a little hole in the edge for suspension. The coin apparently hadn't been in circulation for long, and this fit the major trade period really well, which here went from probably around 1730 to 1760 or 1762, whereupon the French trade diminished considerably. So we had all this material and didn't really know much about it. When it came time to analyze the artifacts, it turned out that I was the only member in the society who had approached a gun collection. This tiny collection was given to me by an uncle of mine, and didn't have anything in it that was anywhere near as old as the material from the Gilbert Site, but they found out that I knew one end of a gun from another, and so I was kind of sentenced to do firearms. ☺



This turned out to be a pretty good project and we generated a good deal of information.<sup>5</sup> My specialty stayed firearms for a long time because they wouldn't let me play with any other category. Subsequently, I've had the opportunity to deal with other artifacts of various kinds from the colonial period, and I got away from focusing solely on firearms. And, that's kind of the way it went, one little thing after another.

**George:** Were you doing metal conservation at the time?

**Jay:** At that time, metal conservation for most of us (including myself), and this includes the material that I brought out of the Nevada desert in 1949, consisted of brushing the dirt off an artifact and coating it with a shellac or a lacquer or whatever, and that was about the extent of it. There was no real distribution of conservation techniques that I'm aware of at that time. Right about 1960 or '61, UNESCO started putting out publications concerning the preservation of cultural materials, and my specialty happened to become metal conservation—archaeological metals. Starting in 1960-'61, some attention started to be paid to this sort of thing in a formal way. Two gentlemen working for the British Museum put out a good textbook in the 1970s<sup>6</sup> and subsequently, Donny Hamilton<sup>7</sup> down at Texas A&M has put out extremely useful guides for metal conservation.

I found out through experience that those same techniques that are necessary to conserve artifacts from the sea, which are certainly the most seriously contaminated, have to be applied to metal from terrestrial sites. I have learned to treat terrestrial artifacts just like they've been in salt water. If I don't, breakdown is almost certain and extensive. In any case, Plenderleith and Werner,<sup>8</sup> the British Museum folks, put out an excellent publication, and of course Noël Hume<sup>9</sup> has put in shorter form some guidance on the conservation of metal artifacts, among others, of course. These things kind of came about gradually, starting from about 1960 or '61, up into the 1970's. At this point, the laboratories were still improving and developing their techniques.

There is no one set way of going about this kind of work. You have to be flexible, and you have to try to keep up with what's being done, and in my case, you have to try to adapt what equipment and training you have to the problem, because you're not going to have access to the latest techniques or the funds that a real conservation lab has. And that's the niche

I've filled, a poor man's conservator. ☺

**George:** Can you describe your laboratory facilities?

**Jay:** Well, about the best description I can give is what you call Kitchen Table laboratory work. ☺ You made maximum use of what you had available to you in a normal situation. The kitchen table is a very good work place. The oven—you can dry metal, if you're careful about it, to a certain degree, that way. You just kind of add in things as you go along to meet the needs that you see. My vacuum chamber is adapted from a chicken fryer. Publication is probably the main source of help. Equipment is secondary. You need to be—and remain—conversant with the proper procedures. Then you need to simply, but responsibly, adapt them to what you have available.

Fortunately, two of the major chemicals that you need to do a whole bunch of your work are available from the grocery store. Sodium sesquicarbonate, which is a combination of baking soda and washing soda, and sodium hexametaphosphate which is another name for Calgon. These things were recommended and still hold good for treatments of chloride contamination and that's what we're dealing with most of the time. Moisture doesn't rust things, chlorides do. When you get moisture together with the chlorides, then you have things beginning to break down—of course, that's a little oversimplification. So moisture alone isn't our problem. If you can eliminate the chlorides, moisture is no real problem. It's very difficult to eliminate chlorides from anything. You also have to have certain equipment and facilities to guarantee that moisture isn't available in the air around the artifact during storage. Temperature needs to be remain constant. There are a number of other things that need to be addressed as well.

But to get back to where we started, the literature is the best thing—and in that literature you'll find very good guidelines. The first thing they mention is that most people who start to do this kind of thing tend to over do it. They over clean—you do not want to over clean. Once you do something like that, you can't go back!

My experience has taught me that a good deal of information is contained in the rust—in the oxides. But if you remove those oxides, you've lost that information. So you need to be careful about removal of oxides—why you do it, and where

you do it.<sup>10</sup> This means you have to proceed very slowly. You never proceed in haste. And that's the other thing—don't over clean and don't proceed in haste.

Chlorides are our biggest problem, but I think acid rain has contributed significantly since the 1980s.<sup>11</sup> Sites that I have seen material from, and even collected myself before 1980, seemed not to give nearly the amount of difficulty in conservation as those which have been recovered since. There are some signs that the situation may be changing again as more emissions controls come into effect. But I think acid rain might be the key element because I found that the deterioration of metals is traceable not only to cultivated areas where you suspect fertilization, but it also occurs in wooded areas where there has not been any cultivation. And I think maybe a key factor is not so much the quantity of acid rain that has fallen, but where acid rain comes to rest. Certain barriers—natural or cultural—whether they be clay lenses or some other drainage-inhibiting feature, will allow effects of acid rain to accumulate at a given depth.

In any case, the guidelines for basic metal conservation have been published, but you have to stay conversant with them—you have to read, and you have to adapt what you have available to the particular job you have. In this effort, I've been aided a great deal by kind people at the Universities allowing me to use some of their chemical supplies for small jobs. I tend to try to confine my work to small artifacts.

This may be out of context, but I think it's important. The metal detector enthusiasts have magazines, and these magazines have begun to give advice on how to conserve your metal artifacts. The word they use is "clean." And the advice ranges from relatively harmless to very harmful. One of the key things that seems to be very popular is the process of electrolysis, where you reduce the oxides by electrolytic reduction. You can do this with any mild solution and a 12 or 6 volt battery. It's a simple procedure that's been used for a long time. But, the potential for unfortunate use of that technique presents itself if you don't have control over the removal of the oxides—if you don't proceed very carefully you will lose any information that's in the oxides. You will get it down to bare metal, ultimately, but that's not necessarily what you want to do. Many of these artifacts that we deal with at Los Adaes in particular—all the information we really have left

is in the oxides—there's not a metallic core left. And the information we do have is in the shape of the object, and if we remove the oxides, we've lost it. And while we're getting more and more familiar with material culture, there are still many objects that come out of the ground at Los Adaes, that we really don't recognize what the initial use was. So we need to preserve everything we can.

**George:** Could you describe the process that you go through when you deal with the artifacts?

**Jay:** Well, like always, there are a lot of variables involved. I don't have much enthusiasm for someone attempting this, and the reason is this. A technique that I can describe to you is based on my experience. I've been at it a long time, and I've had to live with my failures! ☺ So I have that background, and I'm somewhat reluctant to give a description of any generalized approach to metal conservation.

I'll give you a specific case. A gentleman called who had apparently gotten into some 18th century burials. He had just recovered some knives, presumably from burials, and he wanted to know what to do about the iron blades. So, in my ignorance, I suggested to him that the first thing he could do at this stage was to dry them out in the oven. It didn't occur to me, that he would have the judgment not to raise the temperature above the boiling point of water. But he did! And the next day, I got a phone call and—gee whiz!— his knife blades had blown up on him! ☺ Well, instead bringing up the temperature gradually and letting the excess vapors go out through the oxides, he had heated the knife blades rapidly—building up pressure until they burst. So, he followed the advice I gave him, but my advice was inadequate, of course. That is a very simple example. If you assume that someone is going to have the judgment to follow advice like that, and not have a bad result, you're making a bad assumption.

So, back to your question about how I approach the conservation of any one particular artifact. Because of my experience, over a long period of time, I have a fair idea of what to expect from the artifact in the way of information that I might not be able to see right away. And therefore, if I think a given piece may have markings, then that's a red flag for me to proceed as slowly as I possibly can in reducing the oxides. I may do this by electrolysis, or I may do this by mechanical or chemical

means, but I will proceed very slowly, with a minimal reduction of oxide surfaces, to catch any changes in color or texture. In many cases, it is just a change in color. Lettering can be stamped or a name can be stamped in the knife blade. For the time period that I deal with the most, the 18th century, these letters were stamped in individually. You may have to sacrifice part of the name to get it all. You catch each letter as it comes and record it—sketch it, using a binocular microscope, which is absolutely essential, and you have to vary the lighting. There are techniques I've used where you may submerge the artifact in a solution, and then use the lighting to try to pick up any variance in color or texture. During this whole process, you may lose part of the artifact, to eventually record all of the markings.

There's no set way to do it. Electrolytic is one way, and I hesitate to ever recommend that to anyone because they are generally not willing to use a low enough milliamperage to reduce slowly. It needs to be extremely slow. And you have to know where the information may be in order to watch for it. There are other methods. In the past, one method that worked fairly well was that you heat the artifact, submerge it in acid, and watch for the color change in the oxides. Where the original letter or insignia outline was stamped in, the oxide will normally be less compacted in that area. So when you bring it down and reduce it, and particularly with the acid treatment when you heat it, during this stage—this is a technique where you really need the experience. I don't know anyway to get experience, but to just do it, and sometimes mess up like I've sometimes messed up in the past. ☺ So, as you heat the artifact and watch it, you'll see a change in the color in the oxides where the letters produce a less compact oxide surface. I prefer to do this with electrolytic reduction, very carefully, and constantly examine it with the microscope. I'll also be constantly sketching what I'm seeing during this procedure.

Knowing where an artifact may be marked is very useful. My experience has taught me that in the French trade, particularly if you take the knife blade and put the tip to your left, and the haft to the right, and the cutting edge down, the marking will be always be on the side facing you. You have to kind of know where it may be. It may be parallel to the long axis of the blade, it may be perpendicular to the long axis of the blade, but I've never seen it on the opposite side. Always on the left hand side, closer to the haft.

**George:** I know that your wife, Jerrylee, has helped identify details on some of the Los Adaes materials and has also helped with publications—how does she feel about your kitchen table laboratory?

**Jay:** Jerrylee has been very kind to my interference with her household rights. The kitchen table is not so large a factor here as is the kitchen sink—a place where we do collide at times. She has, however, noted that she could smell some of my earlier conservation techniques at work from as far as a block away! ☺

**George:** You mentioned the negative effects of acid rain—could you talk some more about this?

**Jay:** Since the 1980's I've seen increased deterioration of the metal artifacts<sup>12</sup>. I've mentioned acid rain, and I don't know what other factors might have been involved. The material that was collected off the surface of Los Adaes in the 1960s is in much better shape than what is collected now. For instance, the metal artifacts from your recent stump examination (1998) are in terrible condition. I maintain a serious lack of enthusiasm for leaving the metal in the ground at Los Adaes! ☺

Wells have always been a neat source of information for historical archaeology—much material is discarded in wells. And what little I've seen come from even shallow well excavations—of which I'm only aware of one at Los Adaes—the metal was in terrible condition. And I can't speak for the other material, but as far as the metals are concerned, I hope that we have a real good representative sample. I don't know that I would ever be satisfied, so I'm not qualified to speak about that. But I'd hate to think that we're losing a chance to salvage an even better sample.

There was a time in historical archaeology where metals were assumed to come to a reasonable state of accommodation with their immediate environment. Deterioration was known to proceed rather rapidly at first, and then to slow down. I don't think that situation pertains any more—not from what I've seen.

So the metals at Los Adaes do concern me, and only recently have we been funded, so to speak,<sup>13</sup> ☺ and so we have a better chance to do a more responsible job with the metal conservation at Los Adaes. Before that, we did the best we could with what

we had. And in some cases, it has not been satisfactory. On the other hand, we've probably done as good a job as anyone has. However I've seen work done in other labs where they blasted away with electrolytic reduction, and blasted away oxides and lost surface details—particularly on firearms parts, which I'm most familiar with—where I know there were definite markings, and the labs have no record of the markings ever being there. So, they probably have gotten beyond that stage, and they probably do it differently now.

**George:** You said you had some previous interest in guns, did you have a similar interest in horse gear?

**Jay:** No! I've probably ridden a horse only twice in my life! ☺ But the thing was this—I had a small firearms collection, nothing older than the Civil War, left to me by an uncle. And the people in the Dallas Archaeological Society knew I had a gun collection, so I was it! ☺ And I popped off in a meeting one time when they said something was from a French trade gun, and I said It can't be, but it turned out they were right—they didn't know why they were right, but they were right.

Before we did the Gilbert site report, there had been a report done on a site nearby that was since covered up with a lake. That site had produced metal of the same time period as Gilbert. But their analysis of the material culture gave us no help when we started analyzing Gilbert. They submitted their findings to various experts around the country and the experts didn't agree about how old these pieces might be. So we kind of had the whole field to ourselves. There were pieces of things in the collection that I couldn't identify, I knew they couldn't be parts of firearms. And about the only other major system way out in the country that you knew should have produced metal artifacts are horse-related. You can recognize a sword, you can recognize a knife, but there's all kind of weird little curves and so forth involved with a bridle bit when it's chopped up—you know it's something that was meant for a special purpose. And I thought, by George, I'll try to familiarize myself with that sort of thing, which I have done.

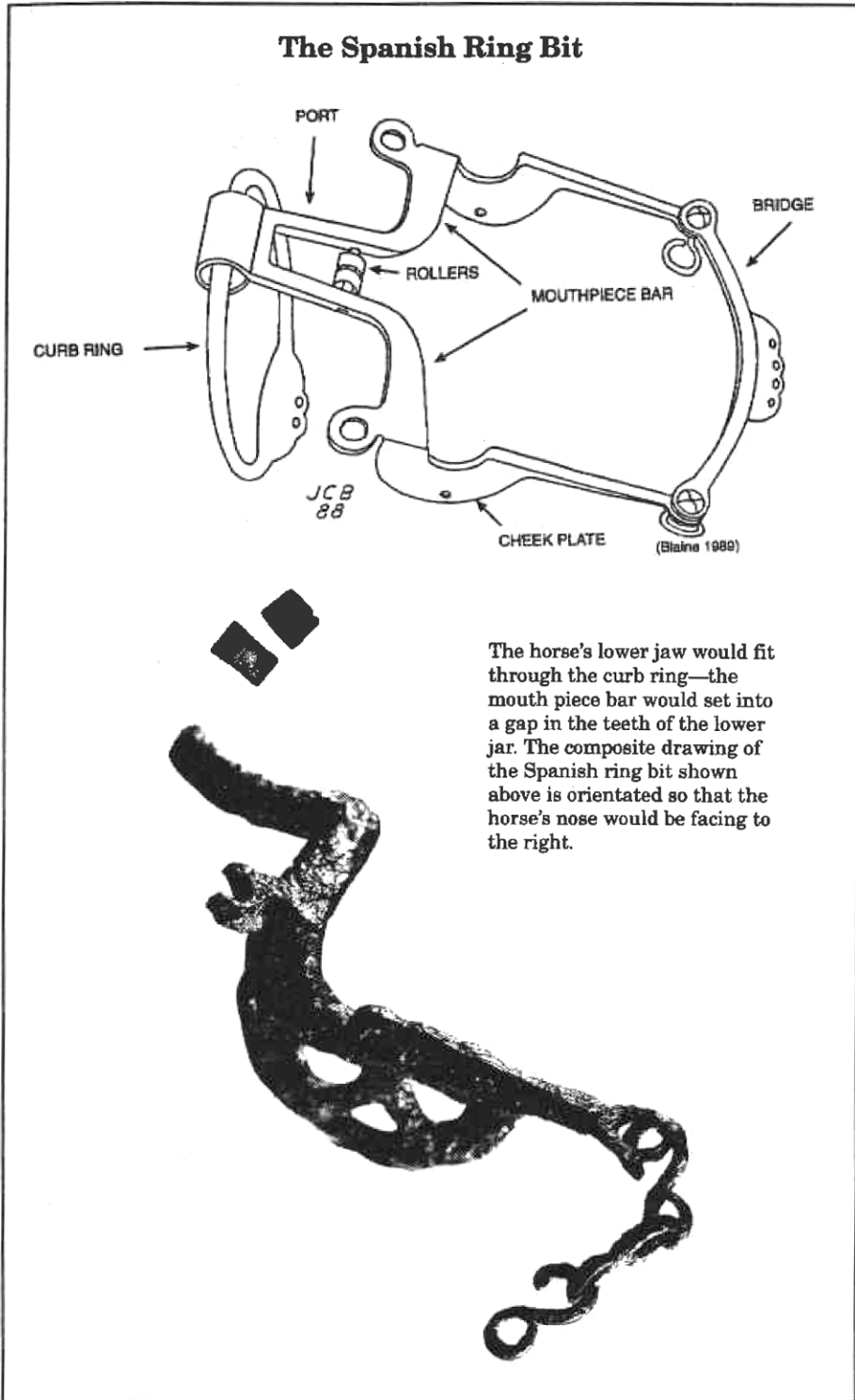
So I got into horse gear, and I thought, well, I'm pretty well up on firearms, and I'm supposedly an authority on that kind of thing now, which means I know more about what I don't know than anybody else does! ☺ Bridle bits turned out to be more complex than I thought. There are differences between Northwest Louisiana, West Texas, New Mexico, Arizona, and

California. These areas would have different styles of bridal bits, depending on what part of New Spain the *vaqueros* or cow hands were coming from. There were also changes in the styles through time. I found out that some which had been described previously as one kind of bridal bit, weren't that at all.

So I'm pretty well up on the Spanish ring bit now (see Figure 1)—I may have that one down pretty well. And in so doing, I have divorced myself from a lot of prejudices. I thought that everything the Spanish did was mean and cruel, because of the Black Legend.<sup>14</sup> And the kind of bit that we're dealing with, the ring bit, is generally described as being a cruel bit—only a mean Spaniard would use a bit like that, but it's just not true. Later data on biting horses has become available in popular publications like *Western Horseman* and *Horse and Rider*, where people have really gotten down and analyzed bridal bits. They have analyzed the leverage, depending upon the length of the lever and location of the fulcrum, and what not, and if you look at that kind of data, it does not fit that the Spanish bit is necessarily cruel. All spurs aren't cruel—misuse of them, yes. But the ring bit is intended as a signaling device, and in that respect, it worked well. It worked so well, in fact, that the Moors brought it out of North Africa, all that long time ago, and those things are still being used in South America to this day. And the South American people certainly cherish their horses—they wouldn't do any thing that would harm the horse or result in the horse being less effective.

I find in the literature a lot of confusion about what to call things in the horse gear, most especially in the ornaments—in the *coscojos*, the little jingles. Various authors of our time have used the same term for things that have different functions—we need to be aware of that. If we use terms like *fica*, *higa*, and *higo*—it's time to standardize what these terms mean, so we're talking the same type of language. Albeit, earlier investigators have used those terms interchangeably, and I'm sure people who have ridden those horses with those bridal bits have used terms interchangeably, but for analysis to have meaning for all researchers, we have to decide on more precise labels. Simons and Turley<sup>15</sup> did us a lot of good when they brought out that spanish colonial ironwork publication of theirs—they did a good job on horse gear. Anyway, horse bits are interesting—if I ever saw a whole bit I probably wouldn't recognize it—I'm so used to dealing with little bits and pieces, that a whole bit would just blow my mind! ☺





**Figure 1.** Spanish ring bit composite drawing by Jay Blaine. Spanish ring bit fragment and tongue rollers from Los Adaes (70% actual size).

**George:** So by looking at the artifacts, you were able to point out descriptive problems in the 18th, 19th, and 20th century documents regarding the Spanish ring bit?

**Jay:** I haven't done it yet; what I told you are what my present conclusions are, but I haven't gone into print with that yet.

**George:** Historical archaeologists have three main sources of information—of course there are the artifacts and their context, and the documents, and oral history—but it's neat when one data source can show that another isn't necessarily what says it was.

**Jay:** Right. Once you come to a conclusion like—the Spanish ring bit was a cruel bit—then you aren't likely to think about it any other way. And if you do that, you short circuit your examination of the artifact. There are historic accounts that say the Indians didn't want the French guns because they burst in their hands. I have never found—and I've looked at literally dozens of breech sections of French trade guns—and I've never found one with any indication of ever having ruptured in the breech. What you find in the documents is that someone with a particular ax to grind is corresponding with a supplier, or someone else, and trying to encourage them to give more credit, or something. You might have one shipment that was faulty, but to generalize is highly misleading. You'll find complaints about all kinds of trade guns, particularly the 18th century, here and there—be they from English sources, or French sources, or whatever, but these generalities, such as French guns are no good because they burst—or English guns shoot further than the Spanish guns—these generalities short circuit our thinking, and we shouldn't indulge ourselves.

**George:** From what little I've read, it seems that the 18th century Spanish guns are portrayed as being at the bottom of the barrel in terms of quality—the Indians did not want the Spanish guns, they preferred the French guns.

**Jay:** Do you know why? To start with, the Spanish weren't anxious to have any kind of firearms in the hands of the Indians, for whatever reason. And remember, the 18th century Spanish guns are awkward looking guns. The Spanish were never big on manufacturing a light flintlock of the type the Indians preferred. The Spanish put out the muskets, the military version of the muskets, and various versions of *escopetas* (light

muskets), but not for trade. And Spanish barrels, for example, are known to have been far superior to any other source of barrels for flintlocks, particularly in the 17th and early 18th century. But, I think, most of all, people are going to go with what's successful. You see both the English and French guns well represented in the archaeological record, but you very seldom see the Spanish guns archaeologically. So, I don't think the Indians saw many Spanish guns either, or were usually in a position to make a choice between the Spanish and French or British guns.

**George:** Were the French able to mass produce firearms?

**Jay:** Absolutely. Not just the French, but the low countries. A good deal of material that we say is French trade—I was careful early on to say “used in the French trade,” because I couldn't say for sure it was manufactured in France, but that it was traded by the French. I bet that almost 50% of the goods traded by the French came out of the low countries. They could manufacture cheaper, adequate quality firearms. They didn't have to be caught up solely in arsenal production for the military who required the heavier muskets, they could concentrate on the manufacture of a lighter firearm, which the Indians preferred. The Indians didn't need a gun that fired a 3/4 inch diameter ball and required a larger load of powder, they didn't need that big old heavy clumsy thing. Just from a strictly practical point of view, why carry extra lead and powder when you didn't need it?

**George:** How would you characterize the Los Adaes firearm assemblage?<sup>16</sup>

**Jay:** There's a very light sampling of firearm parts from Los Adaes. It surprises me. The historical record indicates that there was a good deal of non-official trade, but it isn't really reflected in the firearm sample. What little French and British firearm fragments we have at Los Adaes could be accounted for by the preferences of an individual officer, or two or three. The variety of Spanish firearm parts, for instance, includes some of the tiny flintlock parts which would be suitable for a pocket pistol, but that sort of thing wouldn't be carried by the average soldier. We don't have enough of any one part to see any uniformity in the Spanish firearms, for example. It's a miscellany of parts—our frizzens are different, our hammers are different sizes—we have military size and the real small

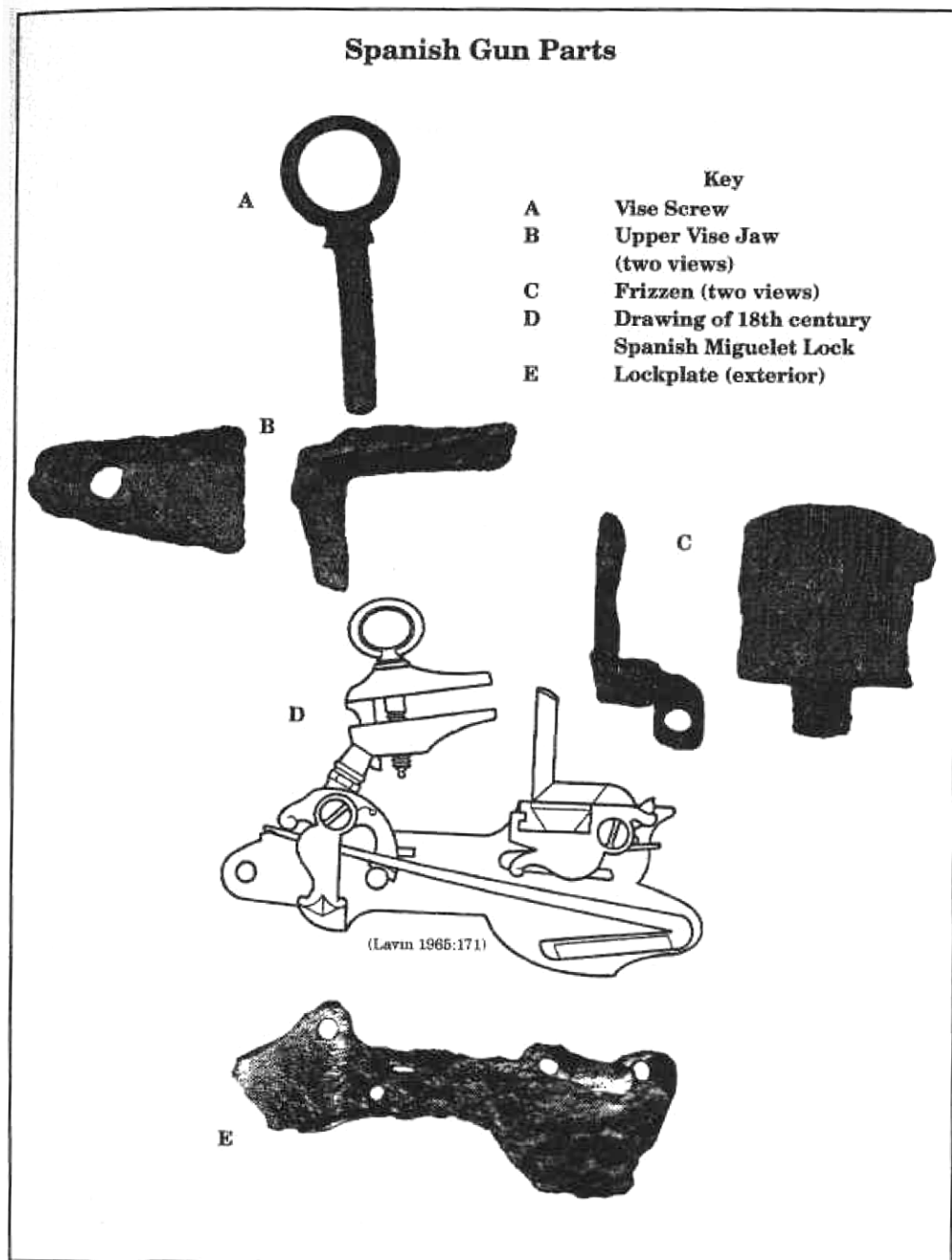
personal size (Figure 2). But we have no consistency. This indicates one of two things. One, they rarely threw anything away—they salvaged whatever they could. The blacksmith might have reworked broken gun parts into something else.

We have a examples of trigger guards that almost certainly were made at Los Adaes—they are way too light in iron construction for normal *miquelet* usage. So, there's been a recycling of a good deal of that material. One example that is really outstanding, and it took me a long time to recognize it, but we have one metal spear point at Los Adaes that was made out of a lock plate. It's now got a perfect boat shape to it—someone went to a lot of trouble to recycle that particular firearm part. All in all, I'm really surprised at the paucity in our firearm sample from Los Adaes. There's indication of a little French trade, but very little (Figure 3).

**George:** You pointed out that we have non-Spanish firearms represented in the Los Adaes assemblage. Is the same true of the horse gear? Do we have non-Spanish horse gear?

**Jay:** That's a good question. I have no data which suggests that the ring bit was manufactured by anyone else—in the times we're dealing with—than the Spanish, coming out of New Spain. It was the type of bit that was associated with one of the two major Spanish styles of riding. In this particular case, it's Moorish derived *jineta*. The Moors brought the ring bit out of Morocco to Spain. It was adopted by the Spanish and then stayed with them. The other major bit is the spade bit, but they're so rare for our area, I haven't seen them from our archaeological excavations. I've only seen them in museums and in some of the literature you passed to me. The one archaeological exception is from the Womack site, although it was initially described as a ring bit.<sup>17</sup>

I have only one unusual ring bit from Gilbert—it's a ring bit, but it's not like any of the Spanish varieties I've seen. I've wondered, is it a French version? What did they come out of Natchitoches with? But I haven't seen one from the 18th century from there. Hopefully, in the future, I'll get to see more of the private collections in that area, particularly to look at pieces in their junk box. Because if the Indians or anybody else got a hold of these things, and salvaged them, they would have been cut up into small pieces. You have to be pretty familiar with the horse gear to recognize it in such a fragmented state. In the inventories of deceased people, they



**Figure 2.** Spanish gun parts from Los Adaes (70% actual size).

will mention bridal bit—but not specifically spade, ring, or whatever, so we're not helped by the literature at all. So right now, we have to depend solely on archaeological evidence. Of course, we've only had two ring bit fragments from Los Adaes—one badly distorted piece, and one pretty good one, and that's all.

**George:** Well, there's a lot more we could talk about, but I'm afraid we've run out of room here. Any final comments, Jay?

**Jay:** I cannot too strongly recommend that anyone who is tempted to treat archaeological metals, or even simply store them, must study the factors discussed by Donny Hamilton and Plenderleith and Werner in their publications.

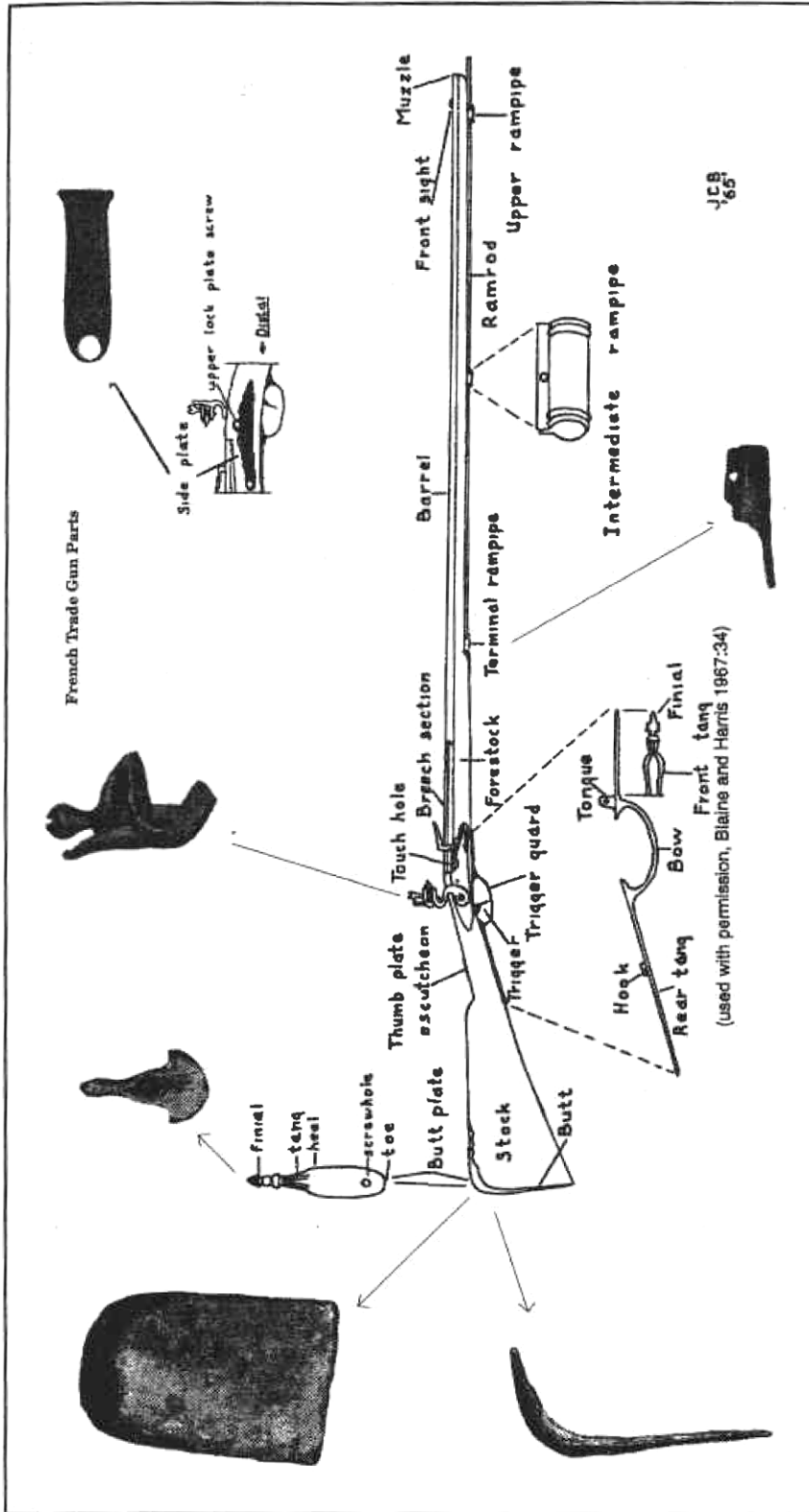


Figure 3. French trade gun composite drawing by Jay Blaine. French trade gun fragment from Los Adaes (50% actual size).

## End Notes

<sup>1</sup> H.F. Gregory, *Eighteenth Century Caddoan Archaeology: A Study in Models and Interpretation*. Ph.D. dissertation, Dept. of Anthropology, Southern Methodist University, Dallas, Texas. (University Microfilms, Ann Arbor, 1973). H.F. Gregory (editor), *Excavations, Unit 227, Presidio Nuestra Señora del Pilar de los Adaes (16Na16)*. (Baton Rouge, LA, 1985); *Excavations: Presidio de Nuestra Señora del Pilar de los Adaes*. (Baton Rouge, LA, 1984); *Excavations 1981-82, Presidio de Nuestra Señora del Pilar de los Adaes*. (Baton Rouge, LA, 1982); *Excavations: 1979—Presidio de Nuestra Señora del Pilar de Los Adaes Report*. (Baton Rouge, LA, 1980).

<sup>2</sup> Jay Blaine had little choice but to be self-taught—metal conservation programs were simply not widely available when he became interested in the field in the 1960s. Identification of Spanish and French colonial period metal artifacts was still in its infancy during the 1960s, and Mr. Blaine's contributions to identifying Spanish and French colonial artifacts in Texas, Louisiana, and Oklahoma are now standard references for colonial period researchers in this region.

<sup>3</sup> The interview with Jay Blaine was conducted by George Avery in the Archaeology Lab of the Williamson Museum, Northwestern State University, Natchitoches, LA, on November 27, 1998. The paper presented here is an edited version of that interview.

<sup>4</sup> The ☺ signifies a chuckle.

<sup>5</sup> Jay C. Blaine, *European Trade Goods—Guns*. *Bulletin of the Texas Archeological Society*, Volume 37, pages 33-86 (1966).

<sup>6</sup> H.J. Plenderleith and A.E.A. Werner, *The Conservation of Antiquities and Works of Art*, revised edition (London, 1979)

<sup>7</sup> D.L. Hamilton, *Conservation of Metal Objects from Underwater Sites: A Study in Methods*. Texas Memorial Museum Miscellaneous Papers 4 and Texas Antiquities Committee Publication 1 (Austin, 1976)

<sup>8</sup> Plenderleith and Werner, *ibid*.

<sup>9</sup> Ivor Noël Hume, *Historical Archaeology. A Comprehensive Guide for both Amateurs and Professionals to the Techniques and Methods of Excavating Historical Sites* (New York, 1969).

<sup>10</sup> Jay C. Blaine, *Tiptoe through the oxides The Cache. Collected Papers on Texas Archeology*, Volume 1 (Austin, 1993a)



<sup>11</sup> Jay C. Blaine, Problems in the preservation and study of archeological metals in East Texas, *Notes on Northeast Texas Archaeology*, no. 1 (1993b)

<sup>12</sup> Recent excavations have revealed additional deterioration of the artifacts—the animal bone is in worse shape, and the shell in pottery containing crushed shell has leached out at the surface of the pottery fragments.

<sup>13</sup> Metal conservation is now funded by the Louisiana Division of Archaeology, through the Los Adaes Station Archaeology Program.

<sup>14</sup> The Black Legend is basically a vilification of anything Spanish, and is probably the first example of a nationalistic propaganda campaign in the post-1500 world. It was promulgated primarily by the Dutch and British, starting in the 16th century, in reaction to the militaristic imperialism of the Spanish Hapsburgs in the Low Countries. [See Spanish Colonial Research Center, *The Spanish Black Legend: Origins of Anti-Hispanic Stereotypes*, Spanish Colonial Research Center Publication No. 2, (Albuquerque, New Mexico, 1990); William S. Maltby, *The Black Legend in England; the Development of Anti-Spanish Sentiment, 1558-1660*, (Durham, North Carolina, 1971); Charles Gibson, *Spain in America*, pp. 43-47, 136-37, 156, 159, 166 (New York, 1966).]

<sup>15</sup> Marc Simons and Frank Turley, *Southwestern Colonial Ironwork*, (Santa Fe, 1980).

<sup>16</sup> For descriptions of metal artifacts from Los Adaes, see Jay C. Blaine, Metal Artifacts, In *Excavations, Unit 227, Presidio Nuestra Señora del Pilar de los Adaes (16Na16)*, edited by H.F. Gregory, pp. 35-39 (Baton Rouge, LA, 1985); Los Adaes 16NA16 Inventory, In *Excavations: Presidio de Nuestra Señora del Pilar de los Adaes*, edited by H.F. Gregory, pp. 106-144 (Baton Rouge, LA, 1984); Appendix 1. Analysis and Description of Armaments and Associated Items In *Excavations 1981-82, Presidio de Nuestra Señora del Pilar de los Adaes*, edited by H.F. Gregory, pp. 110-144 (Baton Rouge, LA, 1982);

<sup>17</sup> R.K. Harris, Inus Marie Harris, Jay C. Blaine, and Jerrylee Blaine, A preliminary archeological and documentary study of the Womack Site, Lamar County, Texas, *Bulletin of the Texas Archeological Society* Volume 36, pp. 287-363 (Austin, Texas, 1965)

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