

### ***Introduction to the Curation Crisis***

Curation and collections management in places such as the University of Wyoming Archaeology Repository (UWAR) are crucial in the steps of research done in archaeology. Often however, field archaeologists put the curation of their excavated materials low on their priority list (Benden et al. 2019). This has led to what is called the curation crisis. According to Friberg, the curation crisis, “refers to the uneasy imbalance between the pace of growth of archaeological collections and the resources used for their curation” (Friberg et al. 2019). While this is not always the case, looking back into collections can give insight into not only the current state of artifacts, but also what could be done to better preserve them. When collections are disorganized or poorly curated, research value of these collections goes down as the physical collection often doesn’t match what the repository has on record, making it hard for researchers to do anything with the collection.

There are many different ways that people have begun to approach the curation crisis, however these usually align with three main approaches, or a mix of the three: the need to expand facilities, more funding, and better more updated techniques and curation materials. While just using one of these will not solve the crisis, it is a good steppingstone in the right direction for those in the museum or curation world. However, sometimes the most important thing is to just begin work on updating your collection using modern curatorial standards. The Colby Mammoth collection is just one example.

### ***Introduction to the Colby Mammoth Site***

During the routine construction of a stock pond in 1962 near Worland, Wyoming, Donald Colby uncovered a Clovis projectile point. In so doing, he found some of the earliest known evidence of indigenous human activity in Wyoming, dating to more than 11,000 years ago (Frison 1986). Mammoth remains were discovered at the site as early as 1907, but beginning in 1973, a team of archaeologists led by Wyoming State Archaeologist George Frison, began investigating Colby’s find.

Excavation of the Colby Mammoth Site was undertaken starting in 1973 and was led by George Frison of the University of Wyoming, with completion ending in 1978 with a collagen date of 11,200 years before present being determined (Frison 1986). The minimum number of individuals (MNI) was determined by Frison to be seven, due to the number of scapulae (Frison 1986). The site is one of the largest Clovis-era Mammoth kill sites in North America.

Today, the bones from the Colby Mammoth site are split between the Washakie Museum and Cultural Center in Worland, Wyoming, the Anthropology Museum in the George C. Frison building at the University of Wyoming in Laramie Wyoming, and the rest of the bones are housed in curation at the University of Wyoming Archaeological Repository, or UWAR, also in the George C. Frison building but actually part of the State Archaeologists office.

This condition report focuses on the bones currently in curation at the University of Wyoming Archaeological Repository. In it, the focus is on the collection prior to this project and why it needs to be updated, the work done to update the collection, as well as an analysis of the curation crisis as it relates to the Colby Mammoth collection at UWAR, and finally advice on how people should approach similar collections in respect to the curation crisis.

Overall, this condition report and analysis not only provides an update report on the Colby Mammoth collection, but also why something like this needs to be updated for the future, as well as to help others trying to update collections due to the curation crisis.

### ***Status of the Colby Mammoth Collection prior to Rehousing***

Prior to this rehousing project, the inventory had not been updated, according to the inventory, since 1999. The inventory had 10 columns corresponding to site number, catalogue number, class/gen. type, type/genus, element, portion, notes, updated, count, and box number. The total number of artifacts in the old inventory of the site was 1591, ranging from numbers as small as 1 up to 109. While every catalogue number has values in the site number, catalogue number, class/gen. type, notes, updated, count, and box number columns, there were 353 catalogue numbers with no values for type/genus, element, and portion.

The boxes that housed the artifacts were old regular cardboard boxes, looking as if they had been used since the collection was first housed in the 1970s. These boxes, which totaled ten whole boxes and a partial box, were overstuffed with artifacts, and had many heavier objects on top of lighter ones, increasing the chances of damage. Boxes 98 through 106 were all faunal remains from the Colby Mammoth site, the vast majority being Mammoth remains excluding a couple of artifacts. Box 107 was about half Colby Mammoth, with the other half being associated with another site. From there, Box 561 was the last box with Colby Mammoth artifacts. Box 299 was listed as Colby Mammoth; however, it turned out to be affiliated with another site.

In terms of the actual artifacts, most of them were in non-archival Ziplock bags, many of which looked as though they have been in there since the site was excavated in the 1970s. Of these bags, many of them had old scraps of brown paper bag material, where some of the provenience info for the bag was written on. Most of the bags themselves had few labels as to associate them with a catalogue number or had the words "Uncatalogued" or "No Provenience" written on them. A large percentage of the bones, both in bags and not, had some sort of adhesive on them, with most of it looking like it had been in baths of Elmer's glue.

### ***Why are these practices bad for artifacts?***

For these artifacts, and all artifacts in general, regular corrugated cardboard contains acidic pH levels, as well as lignin. The lignin, along with a high acidic pH, leads over time to acidification in the cardboard, which can leach out into the artifacts that it holds. Older collections, such as the Colby Mammoth collection, all used to house their artifacts in these regular corrugated cardboard boxes. By sitting in repositories for decades, the acid and the lignin can lead to acidification of the cardboard, which over time can break down materials

within the box. Also, since the boxes were so overfull and packed to where some heavier objects were on top of lighter ones, not only could they receive acidic damage from the box, but also receive damage via heavier objects.

Polyethylene bags, as compared to regular plastic Ziploc bags, are tear resistant and more opaque. This, along with being more chemically resistant and thicker than Ziploc bags, make them ideal for curation. By using regular Ziplock bags, the Colby Mammoth collection, for the bones within bags, were more susceptible to light pollution, damage from other artifacts in other bags, and at risk of falling out of their respective bags. Some of the larger bags had tears within them, with some of their contents falling out into the box. As a curatorial issue, by falling out of their respective bag, artifacts lose their provenience info (if there was any) as well as association to other artifacts. By being loose in the bottom of a box with no information written on them, they lose their research value unless their associated bag can be found, which can never always be 100 percent accurate.

In terms of specifically this collection, there were two things that were particularly harmful to the artifacts both physically and in research value. The first was the fact that many of the bones were not in any sort of bag. Curatorially this is bad because, while there is the possibility they could still break, if they were in a bag the pieces would have fallen off into the bag. However, since a lot of bones did break in the box without bags, those fragments that fell off often times lost connection to the larger element. Not only could loose bones be broken easier and lose fragments, but those fragments if we could not find the element, they broke from would become useless for research, as often times it could not be determined what their provenience was nor the type of fragment.

The most significant thing I noticed when rehousing this collection was that many of the artifacts had no labels or had labels that said "uncatalogued". In terms of research value, it really harms collections as those seeking to use the artifacts for future study are not aware of the full scale of the collection. For example, if one of these artifacts was uncatalogued, it would not show up in the database with the collection. For researchers looking at the collection just via the database, or if they are looking for specific types of artifacts, then they are not able to do this since the collection is not actually "complete" in that not everything is in the database that should be.

### ***Updates to the Colby Mammoth Collection***

To begin this project of rehousing the Colby Mammoth collection, I needed to make sure to begin using all modern curatorial techniques and supplies. This included using new curation approved bags (4-millimeter polyethylene bags) and acid-free lignin-free boxes instead of cardboard boxes. By doing this, I would help eliminate the chances of any bags tearing as well as acidification of the box, since it does not contain any acid or lignin.

When it came to identifying elements, Stanley J Olsen's 1979 book *Osteology for the Archaeologist* was used to identify the different aspects of mammoth osteology. In particular, it was used for elements that were not vertebra nor ribs, which consisted most of the collection.

By using the same source and guide for identifying elements, if any element was mislabeled, that same element would be mislabeled as the same thing for the duration of the rehousing project. Going forward, if future researchers realized this, then they could find all the catalogue numbers with that element and make the appropriate changes easier.

Similarly, all curatorial practices were based off of the University of Wyoming Archaeological Repository's (UWAR) *Guidelines and Standards 2021*. While each repository has their own set of guidelines, by following the same guidelines, all of the artifacts were housed and catalogued in the same way. Not only does it help specifically the University of Wyoming Archaeological Repository keep their artifacts and records in the same style, but for this project it made sure that the methods were always kept consistent for each artifact.

In terms of labeling, each label was written using a Pigma micron pen and written on a UWAR catalogue number paper (about 2 inches by 3 inches). This label was then put inside its own bag inside the larger bag holding the artifact(s). For each bag, its own UWAR catalogue number paper was put inside, to make sure all the bags of artifacts had their own specific catalogue number, to make sure everything was catalogued in the database for the Colby Mammoth site. This way, no future researchers would look into the collection and find uncatalogued artifacts. Similarly, an item's label must not only be durable enough to remain legible over time but also be removable if the need arises to make a change (Delfino 2004:214). By writing on a paper label and placing it inside its own bag, it will remain durable yet be much easier to remove than if it was on the bone.

In terms of placing the artifacts in the boxes, they were better organized to have all larger and heavier objects on the bottom. This would help to hopefully eliminate damage to the bones from other objects in the same box. By organizing boxes this way, it also led to them being less full which also helps in decreasing the chances of the bones breaking.

### ***Rehousing Project: Methods***

For the rehousing of the Colby Mammoth collection, the methods section was based on the University of Wyoming Archaeological Repository's UWAR's *Guidelines and Standards* as of 2021.

#### *Materials*

4 mil polyethylene bags (of various sizes)

Acid-free lignin-free boxes

Ethafoam plank (for stabilizing fragile bones)

Pigma micron pens (for labeling)

UWAR catalogue number paper labels

Borosilicate glass vials (for very small fragments)

Soft brushes and bamboo skewers (for cleaning)

Access database (for inventory/basic cataloging data)

### *Procedure*

1. Make Excel Spreadsheet with category headings: UWAR Cat # (48WA322-#), Previous Artifact #s, FS#, New Box #, Old Box#, Count, Provenience (as written on bone or packaging), Unit, Point Plot, Object Type, Genus, Element, Side, Portion, Modification, Taphonomy, General Condition, Treatment, Sampling Priority, and Notes
2. Fold an Acid-free lignin-free box and print label.
3. For each artifact or bag of artifacts, record all available info that is currently written on the bones themselves, on foil covering bones, on bags, or on boxes in Excel spreadsheet. Place in corresponding columns in Excel Spreadsheet.
4. If no info is given for Category in Excel spreadsheet, try to locate info or determine to best of ability. If info cannot be determined write US (for unsure).
5. Clean each bone, if needed, using a soft brush or a bamboo skewer following UWAR's Guidelines and Standards as of 2021 on cleaning bone. For bones needing stabilizing, follow UWAR's Guidelines and Standards as of 2021 on stabilizing artifacts (use Ethafoam plank).
6. Once all bones/artifacts are clean, fill out a UWAR catalogue number paper label using the Pigma micron pen. The new catalogue number will be the number in the "UWAR Cat # (48WA322-#)" column. These start at 33 and go up by one for each new entry.
7. Place filled-out UWAR catalogue number paper label in a small 4 mil polyethylene bag (about 2 inches by 3 inches big to fit label)
8. Place artifacts in a 4-mil polyethylene bag (size depending on size of artifacts). If there are very small fragments place in a Borosilicate glass vial in bag with the rest of corresponding artifacts.
9. Place bag containing UWAR catalogue number paper label in bag with corresponding artifacts.
10. Place artifact bags that are heavier and larger first and then place lighter artifacts on top.
11. Once new box is filled, repeat step 2.

### ***Status of the Colby Mammoth Collection after Rehousing***

The final inventory after I finished rehousing had 20 columns corresponding to UWAR Cat # (48WA322-#), Previous Artifact #s, FS#, New Box #, Old Box#, Count, Provenience (as written on bone or packaging), Unit, Point Plot, Object Type, Genus, Element, Side, Portion, Modification, Taphonomy, General Condition, Treatment, Sampling Priority, and Notes. The

total number of artifacts that I counted of the collection was 2687. While this is still more than the number of the old database, I did not count some bags of fragments where it was hard to differentiate between what to call fragment and what not to call a fragment. Because of this, the number of actual fragments is larger than the number 2687 that I counted. This also usually tended to be large bags of previously uncatalogued bones, which would not have been seen in the old database. Thus, the actual number of artifacts far exceeds the old databases count.

Unlike the old database, every catalogue number after rehousing had something in every category, even if it was US for unsure. The only two columns that had this throughout the new Excel spreadsheet were the unit and plot point, as no info could be found for any artifacts for these values. Some of the count fields were also left US, but this was due to just too many fragments being too small to determine if they were fragments or not, so they were left uncounted. Going forward, these could be counted to get a more accurate count of the collection, but due to time constraints they were skipped over.

The boxes that now house all the artifacts that can fit into boxes are Acid-free lignin-free curatorial boxes. The first new box was given the label 98, same as the first old box, and continued in a row to label 106. From here, boxes got labels 561, 2818 through 2820. Thus, 13 boxes were used for this rehousing project. By using more boxes, they were not as crammed as before, and the boxes were organized with heavier objects on bottom.

In terms of the actual artifacts, all of them are now in 4 mil polyethylene bags (of various sizes) or, for those too big for boxes, have been properly curated following UWAR guidelines. All of the old scraps of paper in bags containing them were all thrown out, though their info was transcribed into the Excel spreadsheet before being thrown out. All of the bags now have UWAR catalogue number paper labels, and while a large number of artifacts still have no proven info, all of the artifacts from the boxes are now catalogued.

### ***Summary of Rehousing Project Results***

Overall, with the Colby Mammoth collection this project did a lot in order to make it useable for research. The database for the collection is complete, and is much more detailed than the old database. With this, the physical collection now matches the records in the database, allowing for proper research to be done. However, there is still a lot of artifacts that were labeled as unidentifiable. For the future, most of these artifacts could be identified, however there is still quite a bit that needs to be further evaluated. Going back to research value, the main thing that still needs to be done with this collection is to try to find more provenience information for a lot of the artifacts. While this information could very well not be out there, due to time constraints on this project it could not be hunted down.

Despite the lack of provenience information, the most significant result of this project is the new research value of the Colby Mammoth collection. Prior to this project, the state of the collection was such that no real research could be done both with the physical collection and the database. Now, since the physical collection matches what is in the database, as well as the database being more detailed and expansive, future researchers can actually use this collection.

### ***The Future of the Curation Crisis***

In terms of this project and its effects on the curation crisis, it goes a long way to show how museums and curation facilities should begin to handle this crisis. When it comes down to it, the first thing that needs to happen is to get a proper count of what is in the physical collection. By doing this, repositories and museums can get an accurate idea of what is in their collections, and get a sense of how large it truly is. This also allows them to make sure that their digital and physical records match, allowing their collections to be used by others.

While the methods used in this project can be applied broadly to any museum or repository, it is important to note that for this project I was paid to do the work. One of the most significant problems in combatting the curation crisis is that many places simply do not have the funding to both hire the people to do the work, but also buy the supplies so the work can be done.

Despite this, to truly begin to fight the curation crisis, opportunities like this project where people are both paid to work but also paid to learn proper techniques is what needs to happen for the future of the curatorial world. Similarly, this project also emphasizes the importance of adding research value to collections that are in a bad state, such as the Colby Mammoth collection. Not only will collections be updated, but they are also able to be used for research by future scholars since both the physical collection and their associated records match and are accurate. So, instead of sitting on a shelf taking up space, they can be of use academically.

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