



Conserve O Gram

July 1993

Number 17/2

Packing Museum Objects For Shipment

Packing museum objects for shipping can present a challenge. Imagining what can happen to an 800-year-old Anasazi corrugated jar during shipment is frightening. With proper preparation and planning, however, museum objects can be shipped safely and securely.

The following procedures and techniques are based on the experience of Mesa Verde National Park's curatorial staff in packing artifacts for a traveling exhibit, *Gustaf Nordenskiold, Pioneer Archeologist of Mesa Verde*. The exhibit was displayed at the park before traveling to five museums. The majority of the 200 objects were archeological and included sandals, baskets, bone implements, stone tools, pottery, and fiber bundles.

Packing techniques that mitigated the following two concerns were employed: minimum handling of the objects, and simplified unpacking and repacking of the objects by the five museums involved. A packing method known as "package-within-a-package" was used: cavity-packed objects are placed in cardboard boxes; cardboard boxes are then floated within an outer protective shipping crate that provides a safe, stable environment. This *Conserve O Gram* discusses cavity packing and preparation of the boxes. *Conserve O Gram 17/3* describes construction and packing of the crate.

Keep in mind a few basic considerations during the packing process: objects must be properly supported at the strongest points; objects must be protected against the effect of temperature and relative humidity changes and against vibration caused by transporting; and objects must be properly spaced within the box to avoid potential damage caused by crowding.

Preparation

Planning and preparation must precede the packing of museum objects. (See *Conserve O Gram 17/1*.) It is necessary to inspect and document object condition, select a safe method of shipment, prepare a work space, acquire materials, and observe rules for safe object handling. See *NPS Museum Handbook, Part I (Rev 9/90)*, Chapter 6, for guidelines on each of these procedures.

At Mesa Verde National Park, the Nordenskiold exhibit was displayed in a building separate from the museum collection work space, making it more practical to pack objects in the exhibit space after the exhibit closed. To minimize the amount of dirt and dust, the boxes and crates were constructed and the Ethafoam® was cut beforehand in a separate space from the exhibit area.

One point cannot be overemphasized: *allow sufficient time to pack the objects without being hurried and without interfering with other work activities*. The amount of time required to safely pack an object for shipment can be hours or, in some instances, days.

The Corrugated Box

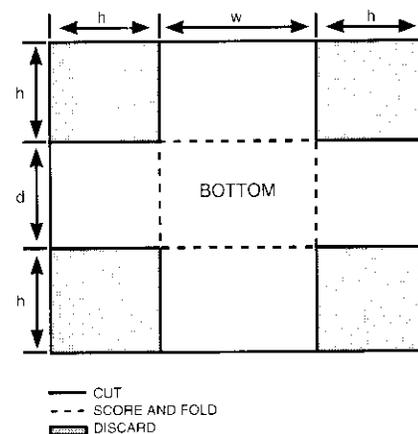
Assembling boxes in which the objects are to be cavity packed is the next step in preparing objects for shipment. Boxes can be either purchased or custom-made. On the one hand, purchasing appropriate size boxes can save valuable staff time. On the other hand, constructing boxes permits customizing them to the dimensions and packaging needs of the objects.

Acid-free corrugated cardboard, both 2- and 4-ply, was used to construct the boxes. It is not absolutely necessary that acid-free cardboard be used. Cost may preclude using acid-free materials. However, using these materials shows that special care was taken during the initial packing of objects and encourages similar care by the receiving museum. In this case, 2-ply corrugated cardboard was used to construct boxes containing small, lightweight objects (e.g., bone awls, stone points, sandals), while 4-ply corrugated cardboard was used for heavier objects that required additional strength and for fragile objects that needed additional protection (e.g., pottery, stone axes, baskets).

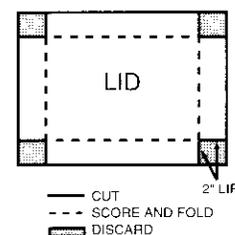
The following procedures may be used to determine the size of the boxes needed to pack museum objects for shipment. The procedures apply either for purchasing ready-made boxes or for estimating the amount of cardboard that will be needed for custom-made boxes:

1. Obtain the dimensions of the objects. Photographs of the objects that include dimensions can be helpful, but seeing and examining the objects are important.
2. To these dimensions, add a minimum of two inches on every side as well as top and bottom between object and box for the cavity packing material. When packing multiple objects per box, include space between objects for packing material. Objects of similar material can be grouped together in a box when properly spaced. A listing of the objects grouped according to size within the material type can also be a help in estimating box sizes.
3. When standard boxes are used, obtain the sizes that closely fit the dimensions calculated in step 2 above. It is better to use a box that is a little too large than too small.
4. A two-piece custom-made box consisting of a bottom and separate lid can be constructed as follows:

- Use a mat knife (e.g., an X-Acto knife) and metal ruler to cut corrugated cardboard. Place the ruler, which is used as a cutting guide, along the line to be cut. First score the cardboard along the line, then make additional cuts until all layers of the cardboard have been cut. Change the knife blade frequently to maintain a sharp edge for clean cuts.
- Cut and construct the bottom before making the lid to ensure a snug fit as shown. Score (without cutting) the cardboard along the line to be folded. Tape the corners with fiber tape or reinforced strapping tape. Make a pattern or template to follow before cutting.



- To make the lid to fit the width and depth of the bottom, place the bottom of the box on a sheet of corrugated cardboard and trace the outline. Allow two inches on each side to form a lip for the lid.
- Score the cardboard along the line to be folded to make the lip. Tape the corners with fiber tape or reinforced strapping tape.



Cavity Packing for Boxes

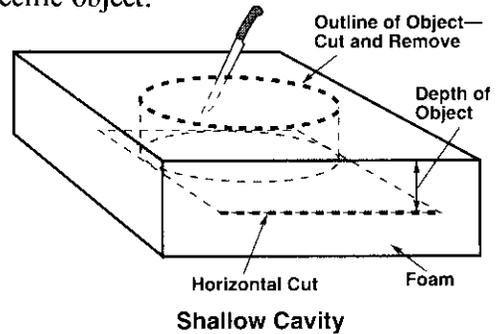
Cavity packing involves placing an object in successive layers of material (e.g., polyethylene foam) into which an opening is cut. The packing material insulates the object and will absorb vibrations created during shipping. Cavity packing supports the object and cushions it from movement. It also creates a micro-environment for the objects.

Polyethylene foam (e.g., Ethafoam) can be used to cavity-pack many solid, stable, three-dimensional objects. It is also good for very heavy objects. For more vulnerable objects, such as ceramics or glass, a softer urethane ester-type foam may be preferred.

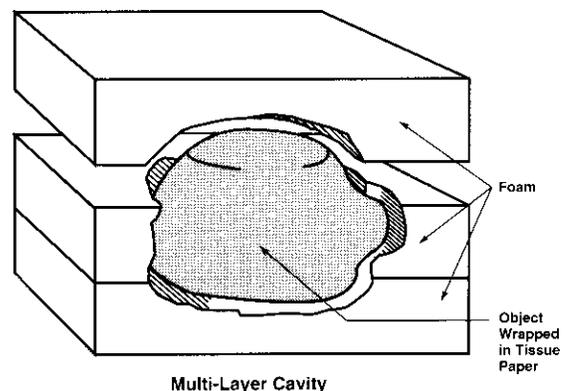
Ethafoam is available in various densities and comes in sheets 4 feet wide by 8 feet long, with thicknesses varying from 1/2 to 4 inches. The 2- and 3-inch-thick foam was the most useful for this traveling exhibition. Both the 3- and 4-inch-thick Ethafoam can be more difficult to cut by hand and it may be necessary to use an electric saber saw. A sharp, long-blade utility knife, a serrated bread knife, or an electric slicing knife can also be used for cutting. The steps to fabricate cavity packing are as follows:

1. To begin cavity packing, cut the layers of foam to fit the length and width of the box. The number of layers will depend on the depth of the box and thickness of the foam.
2. Take the piece(s) of foam to be carved for the cavity and draw an outline of the object on the foam. Place the object directly on the foam, outlining *carefully* with a No. 2 pencil. Take care not to mark the object. Size the cavity so that the object is held firmly in place yet can be removed without abrasion or damage.
3. A horizontal cut can be made into the side of the foam under the object's outline and at a depth equal to the thickness of the object. Next a cut is made following the object outline down to the horizontal cut. Remove

the foam cutout. If more than one object is packed in a box, label each cavity to that specific object.



4. Allow enough room so that the object can be wrapped with acid-free tissue before being placed in the cavity or that the cavity can be lined with tissue and then folded over the object without crushing it. The tissue prevents abrasion and the loss of fragments dislodged during transportation and also aids in removal of the item from the cavity. When the cavity is lined with tissue, it remains in place while only the object is removed.
5. For shallow cavities, a 1/4-inch-wide strip of cotton bias tape can be placed under the object so that the ends of the tape can be grasped in order to gently pull the object out of the cavity.
6. When cutting a deeper, multi-layer cavity, each layer must conform to the shape of the objects at that level. Fill in excess space with acid-free tissue. Number the layers using felt tip marker so that they are repacked in the same order.



7. After the object is placed in the cavity, add the top layer of foam to completely fill the box and prevent any movement.
8. Secure the lid to the box with adhesive tape or tie it with cotton bias tape.
9. On the exterior of the box lid, list the catalog numbers for all objects in the box as well as the exhibit number, the object box number, and the number of the crate into which it will be packed. Either on the exterior or interior of the box lid, note any instructions for special handling, for unpacking, or for repacking the box. Include photographs or photocopies of the objects that are contained in the box.

The above method for packing objects will minimize the hazards that objects are subject to during travel. Used successfully by Mesa Verde National Park, it is one of several ways to safely pack objects for shipping. Consult the NPS *Museum Handbook*, Part I (Rev 9/90), Chapter 6, for alternative methods that may suit a particular situation. Procedures and techniques for packing ceramics, glass, and stone are discussed in the NPS *Museum Handbook*, Part I, Appendix P. Where there are special concerns regarding the packing of a specific object, consult a conservator before proceeding.

Sources

The supplies necessary for packing objects can be obtained through a packaging supplier, or consult the NPS *Tools of the Trade* for names of vendors for specific materials. **NOTE:** When ordering supplies that will be used for object packaging, emphasize that supplies must arrive clean. This is especially important when ordering polyethylene foam (Ethafoam). Also consider where packing materials will be stored until used. Because foam and paper products absorb moisture, they should be stored in a space that provides control of relative humidity levels.

Standard size, corrugated boxes can be purchased by parks and other government agencies from General Services Administration (GSA). They also are available from local packaging suppliers.

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