

# Preservation Practices



by Hugh Phibbs

## *Cautions with Relative Humidity*

Most framers are well versed in the issues of the pH of matting materials and ultraviolet absorbers in glazing products. They can offer many choices which benefit the framing customer in both these areas. However, the extent to which framers are prepared to address problems involving relative humidity is a good deal more modest.

Fears about unintentionally creating overly damp conditions in the mat package make many framers shy away from truly sealing frames. The vision of mold growing inside a frame or foxing occurring on the matting can easily give one pause and framers should be applauded for their caution. The questions surrounding relative humidity are not, however, as arcane as they might appear.

The hazards of very high or low relative humidity can be easily understood. Extremely dry conditions are a grave threat to wood and wood laminates, ivory, hides, horn, bone, many paint films, and glue layers. As such materials become desiccated, they can crack and change shape. Paper becomes brittle and more fragile when it is very dry.

When can such conditions be expected? Land areas which are far from sources of airborne water have dry climates. The high plains of our Rocky Mountain region experiences conditions of relative humidity which may hover around 20% annually. Collectors in that region would do well to focus on items made of metal and to avoid leather, wood, and the like.

When a residence is heated, air from the furnace will be desiccated. Even an

effective humidification unit will be hard pressed to keep the relative humidity in the home at 50% at 70°F. Air which is that humid may condense on the inside of the windows of the home or its exterior walls. If the moisture winds up inside the walls, it can degrade the structure.

An item in an unsealed frame in a home will likely go through a dry phase during the winter. Since most framed materials are not overly sensitive to dry conditions, this is usually not a problem.

A dry phase will probably not occur in areas which do not have significant amounts of heated air in the winter. In Hawaii or southern Florida, for instance, a frame may be in relatively damp conditions year round. Here, the framed item is in constant peril of foxing or mold growth. When relative humidity exceeds 65% at 70°F, mold may begin to grow.

The germinal parts, commonly called spores, are actually conidia. They are airborne and can be found on most surfaces which have been exposed to the air. As the moisture available to them increases, they can begin to send rootlike filaments into organic materials such as paper, wood, or hide. They extract nutrients and produce more fruiting bodies which can be seen on the surface of the infested material. If relative humidity is lowered, their destructive growth is arrested but potential for future growth remains.

In the past, antifungal materials were used to address this problem. Thymol, an active ingredient in antiseptic mouthwashes, is the most common of these. However, many fungicides tend to discolor the

paper to which they have been applied when exposed to light for a period of time. A further caution arose from the fact that these fungicidal materials are highly volatile and cannot be expected to protect treated materials from future infestations.

Ultimately, the simplest answer to the problem of mold and mildew is to avoid damp conditions. To accomplish this, one must appreciate the varied sources of high relative humidity.

Those who live very close to the ocean and other salt water bodies are affected not only by the moisture, but also from salt which is borne inland as an atmospheric aerosol. Metals will be very difficult to maintain here. Other items should be given as much protection as possible.

In the U.S., most residents will be affected by damp stretches of weather during at least part of the

year. Air conditioning is a first line of defense. Room dehumidifiers are often designed with a bucket to collect condensation. This would be impractical with an air conditioner, since it draws so much water from the air that emptying its bucket would be constant. Most homes with central air conditioning will have conditions drier than mold requires.

Even homes with window units are usually not very moist for long periods, since clothing and fabric on the back sides furniture would begin to mold if they were. Mold requires still air to grow, so air movement will discourage growth on open surfaces. Trapped air may be a factor in the growth of mold, but architectural moisture is probably a greater cause.

Exterior building walls without a vapor barrier layer will allow moisture through and into the room. This is true of older construction and

of masonry walls. If moisture comes through the wall into the back of the frame, it may become trapped, making the relative humidity in the frame higher than that of the room.

This may be what is happening in the case of clients who bring in works with mold from homes with well-controlled climates. Interior walls which connect with attic or crawl spaces and are open to outside air may present the same problem.

Sealing the mat/glass package can defend against both very wet or dry conditions, but the framer must be familiar with proper sealing techniques, as well as with management of condition in the shop. This way, the contents will be properly conditioned before the seal is made. Next month, we will look at factors which must be considered and how this sort of management may be simpler to achieve than it first appears. ■