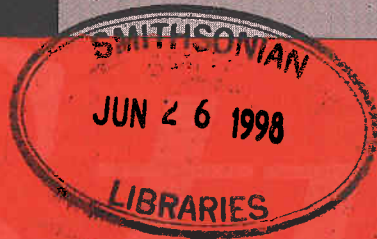


AM
1
C34X
MSRL

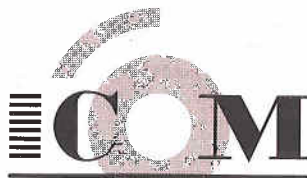
Cahiers d'étude

Comité de Conservation (ICOM-CC)



Study series

Committee for Conservation (ICOM-CC)



INTERNATIONAL COUNCIL OF MUSEUMS
CONSEIL INTERNATIONAL DES MUSEES

#1

néral les ré-
vres de l'é-
a conserva-
n même on
nécessaires
est-on vrai-
ifier et ré-
pareils?

ailleurs, le
vation pré-
et donc la
ce pour en-
rer, surveil-
par les in-

moyens en
erves mais
t surtout un
é. C'est en
ue celui de
i poste que
le pouvoir.
ts et tradi-
mmes très
même si la
va pas sans

oit des con-
teurs, il est
: au servi-
ns. Pour les
ialistes qui
réserves, il
tionnel des
entrée, leur
s rayons, il
i des objets

procède au
ts, à la mi-
appropriés;
ement des
s climati-
le de la sé-
ôle l'accès
aire visiter
Enfin, il est
extincteurs
appliquer

mels dans
is vivantes:
rcheurs y
r ils savent
trouver et
qui les in-
nt un lieu
'on peut y
ditions né-
ns ces con-
ire un lieu
itation. Les
e, en res-
des cours

ou y organiser des stages qui débou-
chent sur des cas concrets.

Rendre ainsi les réserves plus vivan-
tes et plus professionnelles, c'est une
autre manière de restituer les collec-
tions au public, du moins à certaines
catégories de public, tout en amélio-
rant les conditions de conservation.

The Effects of Relative Humidity and Temperature on Exhibited Objects

Charles S. Tumosa,
David Erhardt,
Marion F. Mecklenburg, and
Mark McCormick-Goodhart,
Smithsonian Institution,
Washington, D.C. USA.

Résumé

Les variations de température et d'humidité relative jouent un rôle prépondérant sur l'état des objets de musées. On peut déterminer les limites requises par ces paramètres environnementaux en examinant les propriétés matérielles des composants. On considère que, pour la plupart des objets, les variations d'humidité relative doivent se situer entre 35% et 65% et les variations de température entre 18° et 25° Celsius, c'est-à-dire dans le même ordre de grandeur que pour le confort humain.

Proper environmental control is the most important factor in the preservation of collections. While environmental factors such as light, pollution, and vibration also affect museum objects, temperature and relative humidity (RH) have an overriding effect on their stability.

Consider relative humidity and its variation. A relative humidity of about 50% with little variation has been considered ideal for the overall exhibition and storage environment by many museum staff. This environment, however, is difficult and expensive to maintain throughout the year. If the environmental requirements could be relaxed without causing damage, climate control would be much simpler. Relaxing environmental control requires answering two basic questions. First: do all RH fluctuations, no matter how small, cause damage, or is there a threshold of allowable RH fluctuation below which there is no damage?

Second; if some fluctuation is allowable, how much?

To identify an acceptable RH and allowable variation the relevant material properties of the objects must be known. These properties are dimensional and mechanical changes due to RH. From theoretical calculations derived from and utilizing the results of empirical measurements, the range of relative humidity in which MOST objects are mechanically stable is between 35% and 65%. The mechanical changes which most materials, even those under restraint, undergo during RH fluctuations in this region are elastic and reversible. While higher relative humidities up to 65% may not be suitable for some objects because of the possibility of mold or increases in chemical reactivity, many objects can be exhibited within this range of RH with no damage from dimensional change. Exceptions to this principle are based on other non-mechanical behavior such as the corrosion of metals. These objects should be kept in their own climate controlled containers or cases.

Often objects are recovered from adverse environments such as under water or extremely humid storage conditions and such objects must be treated in ways so that changes in dimension coupled with restraints by their own construction do not allow damage to occur. Some objects equilibrated to a high RH (80+) will crack when brought into a drier environment, especially if there is also an accompanying temperature change. The damage is caused by the specific starting and ending RH, not necessarily the wide range in RH. If possible, objects at risk may be disassembled to allow for equilibration without restraint. The preservation of objects depends upon avoiding the extremes of high or low RH. Establishing an average value of 50% RH results in a relatively large allowable range of fluctuation about this mean value, since most hygroscopic materials are significantly less responsive to RH changes near this value.

The temperature of museums is usually set by considering the comfort level of the visitors and workers. This temperature has often been set between 18 and 25°C with a minimum amount of fluctuation. The same reasoning applies to the discussion of temperature as was applied to relative humidity. Changes in temperature between the above limits will also have a dimensional and mechanical effect upon museum objects. If a restrained object is subjected to large va-

riations in temperature, stresses may develop in the object that can lead to deformation or damage. However, in most cases little effect seems to be caused by changes in temperature within the 18-25°C range. Other problems may arise that are not at first obvious. As temperatures drop, certain materials, such as acrylic paints, may become stiffer and stronger but also may become more fracture sensitive. These materials will become more susceptible to damage by shock and vibration because of their embrittlement.

Lowering the temperature below the 18 to 25° C range can significantly reduce the rate of chemical decomposition of many materials. This effect is useful in the long term storage of objects that are sensitive to ongoing chemical degradation. For example, the lifespan of photographic materials kept at 0°C or below can be hundreds of times that of materials stored under ambient conditions. Most photographic media are mechanically tolerant of sub-zero temperature. Changing the temperature of a building can be a sensitive method for controlling the RH of the building since as temperatures drop RH will increase and, conversely, as temperatures increase RH will decrease. The general museum environment is a compromise between human comfort, the costs and feasibility of maintaining desired conditions, and the preservation of the exhibited objects. Selecting and maintaining the proper temperature and humidity ranges can be both economical in heating and cooling resources and beneficial to the exhibited objects.

Open-heart Restoration: Raising the Awareness of the Public

Roberto Nardi
Directeur du Centro di Conservazione
Archeologica Roma

Résumé

Au cours des dernières années, de plus en plus de chantiers de restauration ont été ouverts au public. On peut dire que, de façon générale, le monde de la conservation a été plus soucieux d'informer les médias et le grand public.