UNA REFLEXIÓN SOBRE LOS EFECTOS DEL AMBIENTE DE MUSEO EN LA DETERIORIZACIÓN Y PRESERVACIÓN DE LAS COLECCIONES LATINOAMERICANAS EN EL MUSEO NACIONAL DE LAS CULTURAS DEL MUNDO, SUECIA

(A REFLECTION ON THE EFFECTS OF A MUSEUM ENVIRONMENT ON THE DETERIORATION AND PRESERVATION OF LATIN AMERICAN COLLECTIONS AT THE NATIONAL MUSEUM OF WORLD CULTURES, SWEDEN)

Natalia FASTH (*)

RESUMEN

La expedición interdisciplinaria Chaco-Cordillera, dirigida por Erland Nordenskiöld, ha sido seguida por un número de expediciones Suecas a América Latina durante el siglo pasado. Los resultados de esas expediciones están reflejados hoy en los depósitos de los museos suecos. En el Museo Nacional de las Culturas del Mundo (ex Etnografiska museet), hay aproximadamente 100.000 objetos arqueológicos y etnográficos, de los cuales casi 70 por ciento tienen origen en Sudamérica. La mayoría de éstos llegaron al museo via Erland Nordenskiöld, sus estudiantes y contactos.

La historia de estos objetos ha continuado desde que vinieron al museo. En los anuarios y en la correspondencia, entre otras fuentes escritas, se puede leer como estos objetos han estado a través de exposiciones, investigación, de tratamientos de restauración y de conservación, o de sólo su almacenamiento. En todos estos casos el proceso natural de deterioración, que en el principio no puede pararse, ha tenido un efecto en las colecciones de los museos. En este trabajo, se presenta como exposición a la luz, humedad, cambios de temperatura, contaminación atmosférica, parásitos afectan los diferentes materiales, lo que conduce a cambios en la estructura interna y al aspecto externo de los artefactos.

Durante el año 2001 las colecciones se han estado mudando a nuevos depósitos, donde se ha tomado una estrategia de conservación preventiva para dar un ambiente óptimo que retrase el proceso de deterioración. Este control del ambiente de las colecciones, que se describe en parte en este trabajo, incluye control del clima, prevención de parásitos con los métodos físicos, sistemas sin ácido de depósito, esto para nombrar algunas acciones. Además, los aspectos éticos con respecto al restos humano también ha sido considerado. Desde el punto de vista del conservador, el objeto de este artículo es dar una revisión histórica del ambiente del museo y de sus efectos sobre las colecciones latinoamericanas en el Museo Nacional de las Culturas del Mundo. Así, una comprensión más amplia de las condiciones actuales, y una perspectiva del futuro de los objetos pueden ser alcanzadas.

ABSTRACT

The interdisciplinary Chaco-Cordillera expedition in 1901–1902, led by Erland Nordenskiöld, has been followed by a number of Swedish collecting expeditions to Latin America during the last century. The results from those expeditions are today reflected in the stores at Swedish museums. At the National Museum of World Cultures (the former Ethnographic Museum in Gothenburg) there are approximately one hundred thousand archaeological and ethnographical objects, of which almost 70 percent originates from South America. The majority of these came to the museum through Erland Nordenskiöld, his students and contacts.

The history of these objects has continued since they came to the museum. In the yearbooks and in correspondence among other written sources, it can be read how they gone through exhibitions, research, restoration and conservation treatments, or they have just been stored away. In all these cases the natural process of deterioration, which in principle can't be stopped, has had an effect on the museum's collections. In this work, insight is given into how exposure to light, humidity, temperature changes, air pollution, handling and so on effect have effected different materials and lead to changes in the internal structure and outer appearance of the artefacts.

* Världskulturmuseet, Box 5303, 402 27, Göteborg, Suecia. ***Correo Electrónico***: natalia.fasth@varldskulturmuseet.se

During 2001 the collections were moved to new permanent storage for which a preventive conservation strategy has been taken in order to give an optimal environment which slows down the deterioration process. This control of the collection environment, which is partly described in this work, includes climate, prevention of pests with physical methods, acid-free storage systems, to name some actions. Furthermore, ethical aspects regarding human remains have also been considered.

From a conservator's point of view, the aim of this article is to give a historical review of the museum environment and its effects on the Latin American collections at the National Museum of World Cultures. Thus, a broader understanding of the current conditions, and a perspective of the future of the objects can be achieved.

INTRODUCTION

In March 1901 an ocean liner with three young men on board left Stockholm for a voyage to Argentina, where they were to be part of the interdisciplinary *Chaco-Cordillera* expedition.

The members of the expedition were the now well-known scientists Erland Nordenskiöld, who was the leader of the expedition and Robert Fries. On board were also Oscar Landberg who was employed as an assistant for conservation and other odd jobs. Half a year later Eric Von Rosen and Gustaf von Hoffsten also joined the group (Lindberg, 1996:65-71).

The collected material from the expedition are at large part today to be found in Swedish museum collections.

Although Nordenskiöld later became known for his important contribution to ethnography, his roll in the expedition was as a zoologist. He gathered a large collection of vertebrate fossils from Tarija Valley in Bolivia. These objects were packed away in the attic of the Swedish Museum of Natural History in Stockholm for 75 years, until they came in focus for research in 1985 (Werdelin, 1991:673). At the same museum also the botanical and ornithological collections are to be found (Muñoz, 2001 personal communication). The Bolivian ethnographical and archaeological objects from the *Chaco-Cordillera* expedition, together with those from Nordenskiöld's three later expeditions (1) to Bolivia, amount to approximately 20 000. Of these around one fourth are at the National Museum of World Cultures (the former Ethnographic Museum in Gothenburg), the greater part of which is from the expedition carried out in 1913 (Muñoz, 2001 personal communication), around fifty objects are at Malmö Museum and the remaining part is at The National Museum of Ethnography in Stockholm (Lindberg, 1996:326).

The *Chaco-Cordillera* expedition was E. Nordenskiöld's first expedition of his own and has been followed by several expeditions of Swedish scholars and scientists in Latin America.

This is clearly evident for a visitor to the stores at museums of world cultures in Stockholm and Gothenburg (2) today. At the museum in Gothenburg approximately 70 000 objects originate from South America, the majority of these came to the museum through Nordenskiöld, his students and his international contacts. These various objects have from the very beginning started to deteriorate, a natural process which in principle can not be stopped. The objects' conditions are depending on many factors such as: what kind of material they are made of, for example plant material and which part of it, processing, wear (while it was in use) and if it's archaeological; the impact of the soil. Further factors of significance for the conditions of the objects are their environment in storage, exhibition and handling procedures. These last factors will be in focus in this article.

The Canadian Conservation Institute outlines nine agents of deterioration which threaten museum collections:

- direct physical forces (catastrophic or long-term and gradual)
- thieves, vandals and displacers
- fire
- water
- pests
- contaminants (chemical agents that can cause alteration of museum objects)
- radiation (UV and visible light)
- incorrect temperature
- incorrect relative humidity (Costain, 1994:2-3)

The collections in Gothenburg have not suffered from catastrophic direct physical forces, as war or earthquakes. Instead damages of objects have been caused by for example improper support and handling procedures. Through history there have also been examples of deterioration as a result from pests, contaminants (outdoor- and indoor sources), radiation in exhibition rooms and incorrect temperature and relative humidity and fluctuations of both.

In order to slow down the process of deterioration conservators are involved in working with the objects. Sometimes this work includes treatments, as for example removal of dirt and

consolidation, of the objects. But this kind of treatment only functions in a short time perspective unless the work is followed by a preventive conservation strategy (sometimes referred to as passive conservation).

REVIEW

Erland Nordenskiöld was the director of the ethnographic department of Gothenburg Museum (3) between 1913 until his death in 1932. He was of the opinion that museums have three great tasks: the first is to preserve objects for our descendants, for whom they shall tell about the nature, art, culture etc. of earlier times. The second is to have material accessible for researchers and through this be an important factor for science. The third is to be a source of education and enjoyment for the general public (Isacsson, 1992:44). This opinion about the role of museums was far-sighted and agrees well with the definition of a museum accepted at the 15th General Assembly of ICOM meeting in Buenos Aires in 1986, where a museum was defined as: a non-profit making, permanent institution in the services of society and of its development, and open to the public which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment (4).

Conservation

Conservation and restoration has been performed at all times, with different methods. The work has been done in accordance with the custom and handiness was a competence that was needed (Fjæstad,1999:16). Higher education in conservation is a relatively new phenomenon. London University started such training programmes around fifty years ago (Konservatorsutredningen, 1983:166). In Sweden the first line of study for conservation at the University started in the middle of the 1980 s (5), and in Norway it took even longer, until 1995 (6). In many countries this kind of education still does not exist which, however, doesn't have to imply lack of knowledge and concern for preservation issues at the museums.

In modern conservation, documentation of treatments applied to objects is essential. It includes a description of the material, a statement of the condition of the object before treatment started, a description of the treatment and remarks about the condition after treatment. This information about a particular object is useful for future treatments and it also makes it possible to follow condition changes over time.

Finding these kinds of records may however be difficult. Since 1978 records have been kept over treatments applied to objects at the museum, but for the time before this information is generally lacking. Conservation has, however, been performed both before and after Nordenskiöld became director. The account for this can be followed in the yearbooks. Restoration has been carried out, among others, by attendants (Rydén, 1936:9) and also by Nordenskiölds wife Olga who restored Peruvian textiles (Nordenskiöld, 1922:63).

In the sporadic information that exists about conservation before 1978, mainly in correspondence, repair of different objects and pest control with arsenic are mentioned (7).

In correspondence between Stig Rydén (8) and E. Nordenskiöld different methods are considered about the repair of ceramics among other things. The repair was preceded by material tests of the repair material and some "worthless fragment" (9). Besides the repairs, some urns were reconstructed, the work being done by Stig Rydén himself or by an attendant, under Rydén's supervision (Rydén, 1936:9).

S. Rydén made an excavation in La Candelaria, Argentina, in 1932 together with Alfred Métraux and Rodolfo Schreiter. Among the excavated material one third (10) is to be found at the National Museum of World Cultures.In the collection (VKM (11) 1933.15) there are sepulchral urns, that measure up to 140 cm in height . These were damaged already at site and the excavators also broke some, as the limited space conditions during transport made it necessary (Muñoz 2001, personal communication). Most of the urns were more or less reconstructed with plaster. An example is an urn (VKM 1933.15.731), see figure 1 and 2, which was discovered in situ, intact up to the neck. One fragment was found in the urn, and according to Rydén "It has not however been possible to fit this fragment to the portion found in situ, and therefore the exact height of the urn cannot be ascertained" (Rydén, 1936:107). The height is after the reconstruction 47 cm.

For a long time reconstruction and restoration made on the original material was considered as great art, but as the conservators' scientific attitude to the objects has increased, the preservation of the authenticity of the objects is given priority. Recreating an object always involves some degree of interpretation, for this reason conservators today do not reconstruct on the original material. Supporting treatment may however sometimes be necessary but in those cases the treatment shall be reversible (Fjæstad, 1999: 16–26).

Material that has been excavated and been left unconserved will eventually achieve some equilibrium

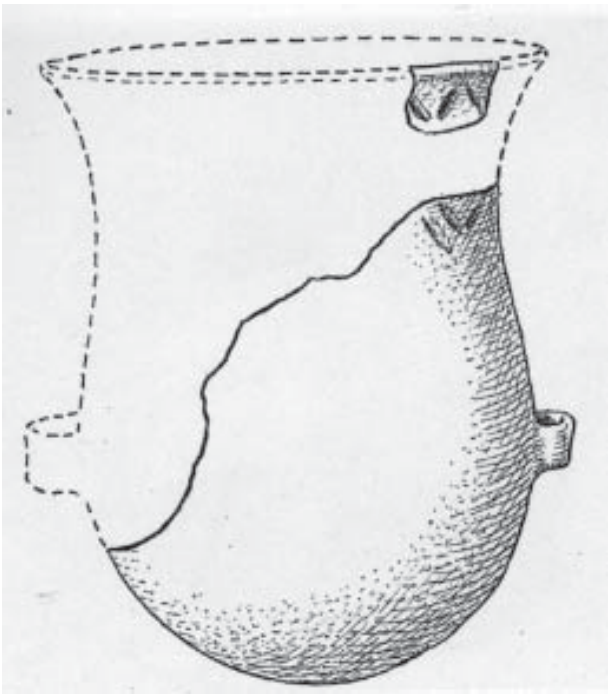


Figure 1. Urn 1933.15.731 (Rydén 1936:107)



Figure 2. Urn 1933.15.731, after reconstruction (photo by: F. Schwetz, 2001)

with its environment: it may survive reasonably intact or may disintegrate in the process of achieving this equilibrium. Material which has been treated in the past may be in worse condition than untreated material, since many early conservation treatments involved the use of substances or methods now known to be unsatisfactory (Pye, 1992:392). The bone material from the excavation in La Candelaria, show no signs of treatments in the past. Abrasions of the cortical layer can however be noted on some. This kind of damage can be caused by fluctuating relative humidity levels, and may obscure or invalidate the analytical potential of the bone (McGowan and La Roche,1996:117).

Collection research

From a preserving point of view Nordenskiöld's two other priorities for museum activities; research and public access are risk factors as they may lead to alteration of the objects.

Nordenskiöld's foresight was also reflected in his view on research. In 1929 the ethnographical department of Gothenburg Museum received a mummy wrapped in textiles from Nasca, Peru. It was radiographed but was not opened because it was considered valuable for future research to preserve it in its original condition (Nordenskiöld, 1929:59–60). The mummy is still not opened. Because of this decision the mummy has been spared the physical stress an investigation may lead to, the most common cause of damage to objects in museums is handling (Bradley, 1992:468).

In 1935 the only metal object (VKM 1933.15.319) in the La Candelaria collection at the museum was analysed, with important material lost as a consequence. The conclusion drawn from this analysis was that it is a bronze (Rydén, 1936:268).



Figure 3. Metal plate, 1933.15.319. Photo by F. Schwetz, 2001.

Today the methods are not quite that destructive, in some cases no sample is needed. In 1999 three metal bracelets from Santa María Valley were analysed by Environmental Scanning Electron Microscope equipped with an Energy-Dispersive X-

ray Spectrometer of their chemical composition. As they were small enough to fit inside the specimen chamber no sample was required (the sample was, however, treated with an abrasive tool of a few square millimetres in order to remove corrosion and dirt) (Ekroth-Edebo, 1999:225–226).

Exhibition

The Ethnographic Museum of Gothenburg closed for the public in 2000 and by that time not quite 1% of the museum objects were exhibited (Soold, 2000:23). Among these displayed objects is a scalp (VKM 1913.1.616) of an Ashluslay (12) Indian from Bolivia which E. Nordenskiöld collected from Mataco during the expedition of 1908–1909. The scalp came to museum in 1915 together with 2350 objects from the expedition as a gift from Arvid Hernmarck. The major part from the expedition was given to Riksmuseet in Stockholm, and the collection in Gothenburg consists mainly of duplicates. According to E. Nordenskiöld the scalps were hanging outside the huts tied to lances in honour of the conqueror, when the weather is beautiful (Nordenskiöld, 1915:76-78) (13).

Light has a deleterious effect on most organic material, a commonly observed effect of light is the fading of organic pigment and dyes (Bradley, 1992:471). The string used for holding the wooden ring together, in which the scalp is attached, reveals darker and deeper colour in the inner layers. In the show-case, where the scalp was displayed, the light was controlled and the lux-level was set at 50 lux, which is a level used for very sensitive materials. Thus, the colour change has probably occurred earlier. In the annual report from 1959 problems with light are discussed; the daylight in some exhibition rooms was so strong that the original colours of the objects faded. In one certain room, with Saami (Lapp) collections, the windows were covered and the daylight replaced with artificial light with a filter against UV–light (Izikowitz, 1959:20).



Figure 4. Scalp, 1913.1.616. Photo by Ferenc Schwetz, 2001.

Objects may need mounting for safe display. Wax is sometimes chosen in order to fix the objects, and this was used for a great number of South American ceramics in an exhibition that lasted from 1994–2000. The wax has in many cases penetrated into the ceramic, probably caused by warmth (spot-lights and high summer temperatures) which changed the properties of the wax. This has in some cases led to irreparable damages of the surface. Different methods, related to the porosity of the ceramic, have been used for the removal of the wax.

Storage

Also those objects which have not been displayed have been exposed to agents of deterioration as a consequence of the environment in stores. In 1981 conservators turned to the press to attract attention to the intolerable situation at museums in Gothenburg. Pictures show urns from La Candelaria which have been damaged through rough handling and boats lying on the cellar floor being destroyed. Incorrect relative humidity in all rooms is pointed out as a problem (Wenander, 1981:26)

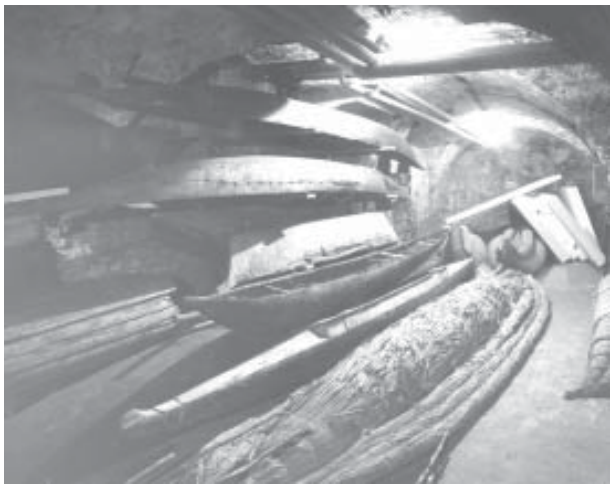


Figure 5. Storage at the Ethnographic Museum in Gothenburg in the 1980s. Photo by L. Noord

More than a decade later the museum moved with its collections and took over an existing museum building, although some 5000 objects were placed in an other storage as there was no space for them in the new building. In 1997 those objects; boats, archaeological collections, including the urns from La Candelaria, and some ethnographical material, were moved to a space within the museum building. According to the year book from this year the choice of this space was taken after great hesitation, as the only advantage was that it is located where the museum activity is (Isacsson, 2000:44).

From a preservation perspective the space is not suitable as storage for museum objects. The

museum is situated in a low part of the city, and next door is a busy traffic route. During the winter months inversion is often formed and air pollution from industry and traffic stays near the ground. Air pollution is not only an out-door phenomenon, through gaps and ventilation they get in-doors. The storage here discussed has gaps of considerable size which entails high levels of air pollution also here. The common gases, sulphur dioxide and nitrogen dioxide are of certain interest as they convert to acids by water and oxygen (14). Acids attack calcium carbonate, for example marble and limestone, which are forms of calcium carbonate. This is a well-known phenomenon in Rome among other cities where statues and buildings are badly affected (Staniforth, 1992:240).

Also organic material is affected by pollution, dried plant material contains a proportion of water, approximately12–15% (Carter and Walker, 1999:77), and it adsorb sulphur dioxide (Madsen 1994:53). Both artefacts made from plants and proteinaceous materials (for example wool and skin) become brittle and discoloured after a sulphur dioxide attack (Staniforth, 1992:241).

In the storage a reed raft (VKM 1928.9.1) from Laguna de Huanacache, Mendoza, Argentina, is stored (the raft is one of the boats lying at the floor, described earlier). It came to the museum in 1928 after being transported under great efforts and costs, as a gift from Alfred Métraux (Nordenskiöld, 1928:58). The gift was considered to be very important for the ethnographical department which thereby would be, and still is, the only museum in the world to have this kind of boat in its collections (Muñoz 2001, personal communication). Today the boat is very dirty and the surface has a pH value of 5 (the control had pH value of 7), and it has suffered from great physical damages.

If damage from handling or storage configurations distorts or interrupts the structure in such a way that the elements no longer play the structural role they were intended to when the artefact was made, deterioration will progress throughout the object until a new equilibrium is established. Degraded components of plant material cannot be repaired or reversed. However by controlling factors as relative humidity and keeping the temperature low and stable it contributes to maintaining elasticity and strength of intact fibres. (Kronkright, 1990: 168–177).

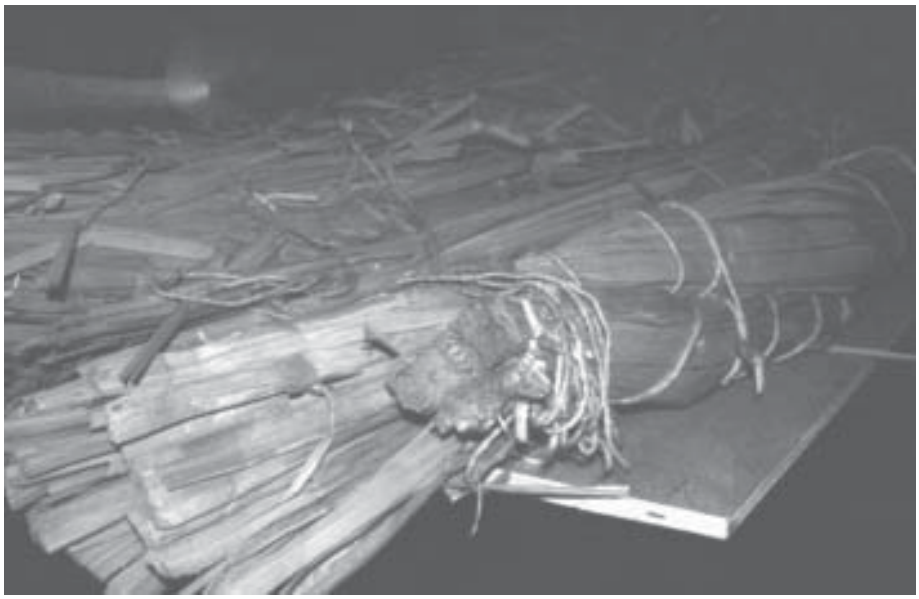


Figure 6. Reed raft, 1928.9.1, from Laguna de Huanacache (Photo by N. Fasth, 2001).

Besides air pollution, incorrect relative humidity and temperature is a problem, different types of materials may need to be stored at different temperatures and relative humidity ranges. Fluctuation in relative humidity causes deterioration, to keep this stable is more important than the level chosen (Bradley, 1992:470). In the storage the levels and fluctuations in principle follow the outdoor climate. The temperature, however is controlled so it is kept around twenty degrees also at wintertime.

It should be pointed out that the remaining approximately 95 % of the museum objects have been stored under comparatively more satisfactory conditions. In the so-called South American storage, however, there have been problems with package material from the time when the collections were moved in 1993. Of more than 60 000 objects, only some thousands have been unpacked until 2000, as there were no space for them. Boxes and soft materials used for transport has generated an acid environment (Soold, 2000:23).

NEW PERMANENT STORAGE AT NATIONAL MUSEUM OF WORLD CULTURES

In 1995 the museum was threatened with closure, but in 1996 the government presented a proposal of an ethnographical central museum and an authority situated in Gothenburg (Isacsson, 2000:9–15). After consultation with the Department of Culture and the Organisation Committee for a World Culture Museum three internationally active experts (15) were engaged, to make an evaluation of the Ethnographical museum in Gothenburg. A short summery of this is: the premises in Gothenburg are partly deficient, especially the stores. Quick measures must be taken, as the collections – apart from the physical risks – are also difficult of access both for staff and researchers. Generally speaking, remote stores for the objects should as far as possible be avoided (SOU 98:125:23–109).

In 1999 the Ethnographic Museum in Gothenburg became part of the state museum authority named The National Museums of World Culture which groups together four museums, three in Stockholm (16) and the new National Museum of World Cultures in Gothenburg, due to open in 2004. Storage has not been planned for in the new museum building, and an external building for all collections of the former Ethnographic Museum in Gothenburg was put in use already in the spring of 2001.

Moving the collections

During the last years pests, mainly moth and beetles, have periodically caused damages on organic artefacts at the museum. As a part of the museum's pest management most objects at the museum are frozen in 30 degrees below zero for three days, before they are unpacked in the new building. Before freezing the objects are wrapped in a buffering material (paper) and sealed in plastic to prevent damage by relative humidity change and moisture migration.

There are risks for the objects when freezing, especially for those objects which have high humidity inherently their structure. Water expand 10 % when it turns into ice, (Åkerlund et al., 1998:27) this may cause physical stress. Materials that are excluded from the freeze process are for example ivory, sensitive archaeological objects and some composite artefacts. Those are taken to a special room for inspection before they are placed in the stores.

Collection environment

In the work with planning for the new building (17) aspects of preventive conservation were regarded in order to slow down the process of deterioration. Aspects considered were for example: stability and the surroundings of the building (traffic, risks for damages coming from humidity), temperature, relative humidity, fire, water, pests, air pollution (inside- and outdoors sources) and a proper storage system minimizing the risks for mechanical damages while handling the objects.

The building is a solid concrete building from the 1980s. The storage area is about 2 500 m^2 (Håkansson 2002, personal communication), the climate is controlled by a system that moisturises or de-moisturises the incoming air to the desired relative humidity level.

The storage systems are metal constructions (with inert lacquer) and mobile storage units are partly used to maximize space. Acid-free boxes and support will be used within the system, when it's needed.

Access

The new storage systems are open and the construction and the size of the units are performed in a way that make handling easy. The existing marking on the objects will be completed with a bar code and basic facts of the object will be available through a hand computer. The increased access is essential in the preservation work of the objects, for the reason that damages caused by for example pests can be detected at an early stage.

Human remains

In Journal of the American Institute for Conservation, in 1996, conservators points out the need to "recognize human remains as a discrete material deserving of consideration that are distinct from any others materials as conservators" (McGowan and LaRoche, 1996:110). In the new building there is a separate room for human remains where they will be stored in acid-free boxes. During the planning of this room an anthropologist (18) has been consulted, besides conservators, concerning ethical aspects of storage of this material.

CONCLUSION

Preservation issues have been regarded through the museum's history. However, lack of space for the collections and inability to control the relative humidity have been pointed out as factors that obstruct the ambitions of satisfactory preservation conditions for the collections. Display and handling are other factors affecting the conditions of the objects. The deterioration processes conservators are encountered

with are of chemical and physical character. In cases where object damages are irreversible conservation treatments and correct environment in storage and display may slow down the deterioration processes and a new equilibrium with the environment can be established. Preventive conservation is essential and is the main type of conservation that the objects at the museum will receive.

ACKNOWLEDGEMENT

To Jan Amnehäll, Monica Gustafsson, Adriana Muñoz, Karl-Göran Sjögren, for reading and commenting this article. Lennart Andersson and Cajsa Lagerqvist for English language revision and Adriana Muñoz for translating into Spanish.

1) 1904–05, 1908–09, 1913–14
2) The National Museum of Ethnography (Stockholm) and The National Museum of World Cultures (Gothenburg)
3) The ethnographical department became a independent museum in 1946, (Isacsson, 2000:15)
4) ICOM Code of Professional Ethics 1.2. Museum, http://www.icom.org./ethics.html. 2001–06–11
5) At the end of the 70s started a theoretical course at the University of Gothenburg, which turned to persons practising the profession (Wenander 1981:26).
6) www.hf.uio.no/iakk.Konservering/Historikk1.htm, 2001–05–14
7) Letter from S. Rydén to Professor Erland Nordenskiöld 8/7/1931. The National Museum of World Cultures Archive.
8) Stig Rydén was born in 1908 and died in 1965. He was drawn to ethnography through E. Nordenskiöld, his doctor's thesis (1936) was, however, on archaeology in La Candelaria (Alvarsson 1992:163)
9) Letter from S. Rydén to the baron (Nordenskiöld), 8/7/1930. The National Museum of World Cultures Archive.
10) The other parts are at Museo Etnográfico in Buenos Aires and Tucumán (Muñoz and Fasth 2001:4)
11) Världskulturmuseet (VKM) The National Museum of World Cultures.
12) Ashluslay is a sub-group of the Chulupi people (Alvarsson 1992:151)
13) Nordenskiöld never wrote any exhaustively work about head trophies (Lindberg 1996:395)
14) The NO in exhaust fumes converts to NO_2 when it react with ozone in the air (www.gbgreg.kommunalforbund.se/regplan/luft/kvaveoxid.html, 2002–02–10)
15) Sir David Wilson, former director of British Museum, Sandra Lorimer, Canadian Museum of Civilisation and Magne Velrue, Norway (SOU 98:125:23–109).
16) |The Museum of Far Eastern Antiquities, The Museum of Mediterranean and Near Eastern Antiquities
17) Conservators at Studio of the Western Sweden Conservation Trust and conservators and curator at the Museums of World Culture were involved in the work of planning.
18) Nicolas Waller, National Museum of World Cultures.

REFERENCES

ALVARSSON, JÅ (1992) Något om arvet efter Erland Nordenskiöld i skandinavisk amerikanistik. In: Erland Nordenskiöld Forskare och Indianvän, edited by JÅ Alvarsson, S Brunius, Å Hultkrantz, SE Isacsson, Carlsson bokförlag, pp 143–170.

BRADLEY, SM (1992) Conservation aspects of storage and display. In: Manual of Curatorship. A guide to Museum Practice, edited by JMA Thompson. 2. Ed., Butterworth-Heinemann, pp 468–473. Oxford.

CARTER, D, and WALKER AK (1999) Care and Conservation of Natural History Collections. Oxford. Butterworth Heinemann.

COSTAIN, C (1994) Framework for Preservation of Museum Collections. CCI Newsletter, 14:1–4.

EKROTH EDEBO, M (1999) Quantitative Analyses by ESEM/EDS of the Chemical Composition of Five Copper or Bronze Objects. In: Masked Histories. A Re-examination of the Rodolfo Schreiter Collection from North-western Argentina, editors P. Stenborg and A. Muñoz. Etnologiska Studier 43, pp 225–226. Göteborg.

FJÆSTAD, M (1999a) Föremålen som kulturarv och källmaterial. In: Tidens tand Förebyggande konservering, editor M Fjæstad. Riksantikvarieämbetets Förlag, pp 15–21. Stockholm.

FJÆSTAD, M (1999b) Respekt för materialen. In: Tidens tand Förebyggande konservering, editor M Fjæstad. Riksantikvarieämbetets Förlag, pp 22–26. Stockholm.

ISACSSON, SE (1992) Nils Erland Herbert Nordenskiöld. In: Erland Nordenskiöld Forskare och Indianvän, editors JÅ Alvarsson, S Brunius, Å Hultkrantz, SE Isacsson. Carlsson bokförlag, pp 29– 51. Uppsala.

ISACSSON, SE (2000) Årsberättelse för 1997. In: Årstryck 1995–1998, editors SE Isacsson, A. Muñoz,. Etnografiska Museet I Göteborg, pp. 35-46. Göteborg.

IZIKOWITZ, KG (1963) Berättelse för 1959. In: Årstryck 1959–1962, editor SH Wassén, Etnografiska Museet, pp 3–23. Göteborg.

KONSERVATORSUTREDNINGEN (1983) Fortsatt konservatorsutbildning: förslag till vidareutbildning, specialistutbildning m. m.: betänkande / av Konservatorsutredningen. Ds U; 1983:2. Stockholm, Liber Förlag.

KRONKRIGHT, DP (1990) Deterioration of Artifacts Made From Plant Materials. In The Conservation of Artifacts Made from Plant Materials, editors MLE Florian, DP Kronkright and RE Norton, Princeton Academic Press, pp 139–193.

LINDBERG, C (1996) Erland Nordenskiöld-ett indianlif. Stockholm, Bokförlaget Natur och Kultur.

MADSEN, HB (1994) Luftforurening. In: Bevaringshåndbogen, editors O Alkaersig, J Garoff and M Lundbaek, Statens Museumsnaevn, pp 52–60. Copenhagen.

McGOWAN, GS and LA ROCHE (1996) The Ethical Dilemma Facing Conservation: Care and Treatment of Human Skeletal Remains and Mortuary Objects. Journal of the American Institute for Conservation. Summer 1996, Vol. 5 Nr. 2:109–21.

MUÑOZ, A and FASTH, N (2001) Inledande undersökningar av en pre-kolumbiansk samling från nordvästra Argentina på Världskulturmuseet. Arkeologen Nr.3–4/01:4–13.

NORDENSKIÖLD, E (1915) Göteborgs Museum Annual Report, pp 75–88. Göteborg.

NORDENSKIÖLD, E (1922) Göteborgs Museum Annual Report, pp 57–63. Göteborg.

NORDENSKIÖLD, E (1928) Göteborgs Museum Annual Report, pp 55–62. Göteborg.

NORDENSKIÖLD, E (1929) Göteborgs Museum Annual Report, pp 57–65. Göteborg.

PYE, E (1992) Conservation and storage: archaeological material. In: Manual of Curatorship. A guide to Museum Practice, edited by JMA Thompson. 2. Ed., Butterworth-Heinemann, pp 392–426. Oxford.

RYDÉN, S (1936) Archaeological researches in the department of La Candelaria. Göteborg. Etnologiska Studier 3.

STANIFORTH, S (1992) Control and measurement of the environment. In: Manual of Curatorship. A guide to Museum Practice, edited by JMA Thompson. 2. Ed., Butterworth-Heinemann, pp 234–245. Oxford.

SOOLD, L (2000) På väg mot Världskulturen. Statstjänstemannen, 12:22–23.

SOU:98:125 (1998) Betänkande av Organisationskommittén för etablering av ett Världskulturmuseum i Göteborg, Kulturdepartementet, pp 23–109.

WENANDER, L (1981) Föremålen ruttnar. Arbetet (Sweden), 4th August 1981. Archive of The National Museum of World Cultures.

WERDELIN, L (1991) Pleistocene vertebrates from Tarija, Bolivia in the collections of the Swedish Museum of Natural History. In: Fosilies y Facies de Bolivia. Editor R. Suarez-Soruco. Vol 1 Vértebrados Revista Técnica de YPFB, 12 (3–4):673–684, Diciembre 1991, Santa Cruz-Bolivia.

ÅKERLUND, MS, FLATO, S and HELLEKANT, A (1998) Från silverfisk till hälsorisk skadedjur och åtgärder i samlingar. Arlöv, LTs Förlag.