Outstanding bronzes

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Content

• Short historical insight on our job
• The model for decisionmaking
• Direct casting of bronzes
• Corrosion and examples
• Damages
“My lord, that is a statue of a Greek marble, and a beautiful one; I cannot remember ever having seen such a fine antique statue of a boy in such a perfect realisation. That is why I offer Your Serene Highness my services for the restoration and add the missing head, arms and legs. In addition I will give it an eagle so the statue can be baptised into Ganymedes. It’s true, patching up antique statues is not my thing – it is for shoe repairman, who actually do a bad job – yet the talent of this great master calls for serving him.”
How are ethics related to conservation?

**Ethics:**
- Part of philosophy that focusses on human morality

**Conservation**
- Maintaining historical (art) objects for future generations
• **6.3 Conservation of Collections**
  An essential ethical obligation of every member of the museum profession is to ensure the proper care and conservation of collections and individual items for which the employing institutions are responsible. The intention must be to ensure that the collections are passed on to future generations in as good and safe a condition as practicable, having regard to current knowledge and resources.
The decision making model

- A model for decision making with conservation of Modern Art, developed in 1999 by Stichting Behoud Moderne Kunst (Foundation of Maintaining Modern Art) and the Netherlands Institute for Cultural Heritage (copyright)
Some fundamental keynotes

- Decision making always has the nature for a compromise between various considerations.
- As such, various considerations are not weighed equally under occurring circumstances.
- The eventual outcome will always be at the cost of one or more of those considerations in which in this occurring case, less value was attached.
- Discrepancy between physical condition and meaning.
Registration of data (1)

Condition (2)

Meaning (3)

Discrepancy? (4)

Possible treatments (5)

Weighing of possibilities (6)

Treatment proposal (7)
Registration of data (1)

• Data of (and perhaps from) the artist of his working method during manufacturing, about the meaning of the work and specifically the meaning of the material.
• Visual material of original or interim condition
• Literature of artist
• Info about materials, manufacturing processes etc
Condition (2)

• Make a description of the current condition, the conservator who will execute this, will make inquiries with other specialists.
Meaning (3)

• What is the subject or theme of the work?
• Which interest has the perceptible appearance for the meaning of the work?
• Which interest have the various used materials for the meaning of the work?
• Which interest has the manufacturing process for the meaning of the work?
• Where is the power of expression of the work?
• Which other important associations are there?
Discrepancy (4)

- Does the meaning of the work change as a consequence of the apparent ageing, damage or decline, so intervention is necessary?

Eg. A scratch on a metal object of Donald Judd has a high discrepancy
Discrepancy (4)

- Authenticity, historical aspects, esthetic factors and functionality move the decision into a certain direction. If we think of a circle where the input will move the decision.

   Judd’s scratch

   Historical context

   Esthetic factors

   Functionality

   Authenticity

   Opinion of the artist
Possible treatments (5)

• Formulate various possibilities for preventive and active conservation that can contribute to neutralise or minimise the discrepancy of the conservation problem.
Weighing of possibilities (6)

- Weigh the possibilities of conservation in relation to the consequences and the risks of treatment to the object.
Instructions for use

- Draw up the treatment proposal and make sure that the motivation of the decisionmaking is kept in the registration of data
Historical manufacturing Techniques

Lost wax technique
• Direct method
• Indirect method
Lost wax technique

Juggling man, Adriaan de Vries, 1610-1615, Getty Museum
een ijzeren armatuur vormt
het geraamte van het beeld
langzame opbouw van het geraamte met klei
rondom de klei wordt de was
in de vorm van het beeld
gemodelleerd
rondom het beeld worden de gietloop, gietkanalen en ontsnapingskanalen als een geraamte van was aangebracht

kernpinnen steken door de waslaag heen
gehele wasmodel
met klei bedekt,
dit is de gietvorm
De was wordt uitgespoten, het vocht en de klei gebakken, en de klein verdwenen.
het gesmolten metaal wordt in de ontstane holte van de verwijderde was gegaan.
Na stolling wordt de gietmantel en de gietloop verwijderd.

Verwijderen van kernpinnen
de Juggling Man nadat het afgewerkt, geciseleerd en gepatineerd is
Damages after manufacture
Corrosion

A degradation of metal caused by an electrochemical reaction with its environment

\[ M \rightarrow M^+ + e^- \]
\[ M^+ + Y^- \rightarrow MY \]
Recognise corrosion

CORROSION

Stable
- Patina Protection

Active
- Loss of Material
- Change of Volume
- Powdery
Archeologic corrosion

Artefact

No active use of the object, becomes imbedded in the ground

Artefact with corrosion

Kind of corrosion depends on its environment
Underwater corrosion

Kind of corrosion product depends on the kind of water, yet also with which material it is found.
Atmospheric corrosion

Artefact

Activation due to atmospheric changes

Artefact with corrosion

Kind of corrosion products depend on the atmospheric pollution
Copper oxides and copper hydroxides red and black

- **Cuprite** (red) $\text{Cu}_2\text{O}$ can form in moist air, after tarnishing or during burial
- **Tenorite** $\text{CuO}$ is usually not very stable and found rarely
Basic copper carbonates green and blue

- These corrosion forms are typical for *burried* bronzes.
- The minerals *Malachite* \( \text{CuCo}_3 \cdot \text{Cu(OH)}_2 \) and *Azurite* \( 2\text{CuCO}_3 \cdot \text{Cu(OH)}_2 \) are most common.
Copper chlorides pale green

- This corrosion form is typical for *burried* or *underwater* objects which have been in contact with Cl variations.
- The minerals Nantokite CuCl, Atacamite Cu$_2$(OH)$_3$Cl and Paratacamite Cu$_2$(OH)$_3$Cl are most common.
Basic coppersulfates light green

- These corrosion products are most commonly found in an atmospheric environment.
- The minerals Brochantite $\text{Cu}_4\text{SO}_4(\text{OH})_6$ and Antlerite $\text{Cu}_3\text{SO}_4(\text{OH})_4$ are most common
Uniform corrosion

• A typical corrosion form where the objects obtain an even corroded layer
Galvanic corrosion
Pitting corrosion

Bronzepest: a cyclic form of pitting corrosion where the metal is transformed in copper chloride. This form, where the metal really falls apart, is only known for archaeologic objects.
History of problems

- A ‘recent’ problem, \( S \) en CO3 based
- Due to use of fossile carburants increase of sulfur as hard to remove dark dirt layers.
Pedestals
Pedestals tell you everything
Patina

- Natural and Artificial
- Recognising a patina
What is a patina?

(Un)Intentional present layer or appearance which is experienced as an esthetic part of the object
The boxer of the Quirinal, Rome

Père en Jean Limet, Paris, 1938

Patina
Niko de Wit
Titaan by Hesselink
Titaan
Detail
Damages

- Natural
- Vandalism
- Treatment
Natural
Vandalism

_Eikon_ by Barbara Hepworth, 1937
Treatment

- Sodium Sesqui Carbonate and chloride corrosion
- Treatments by ‘skillful restorers’

The Dockworker by Mari Andriessen
Previous treatments
Damaged patina
What should we do?
Questions for a conservator

• What is the problem, or do we have a problem (pragmatic or scientific)?
• Do we act on our own, or do we create a trinity between a curator/art historian and a material scientist/conservation scientist.
• Should we train ourself in the traditional skills?
• Is it necessary to follow the decision-making model?
Conservation

- What is patina?
- Waxes or lacquers...
- Conservators training maintenance staff
Who should do the maintenance?

Professional conservators can’t do it all..

**Save Outdoor Sculpture**

Save Outdoor Sculpture! is a private/public initiative to document all monuments and outdoor sculpture in the United States and to help communities and local groups of all ages and interests preserve their sculptural legacy for the next century. 7,000 volunteers!!!
Subjective objectiveness

- Treatment according museum standards or model
- No intervention, only preventive conservation
- Treatment according the craftsman
Literature

• *Copper and Bronze in Art*, corrosion, colorants, conservation. David A. Scott, Getty Publications, Los Angeles, 2002