CONSERVATION

PRINCIPLES

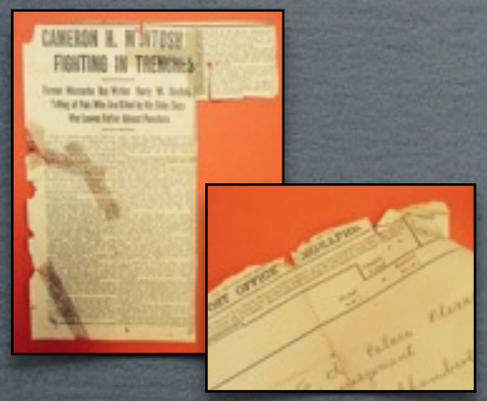
Mal Reynolds GCF Adv

ARQADIA

CONSERVATION PRINCIPLES

Paper and fabrics are organic by nature and as such they will deteriorate with time undergoing both chemical and physical changes

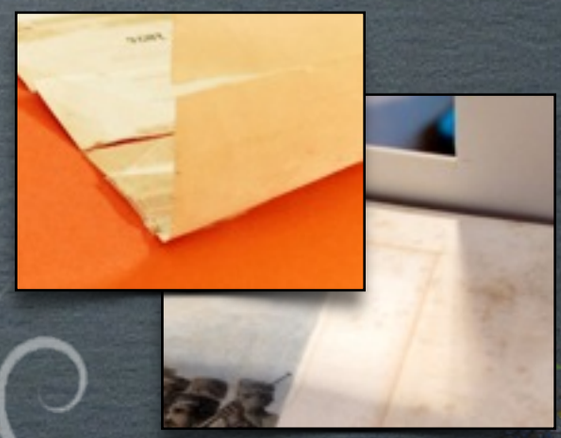
Often one set of changes has a knock on effect leading to another, but on the whole these changes are cumulative and irreversible



Deterioration often manifests itself in:

Loss of strength
Loss of flexibility
Colour Change
Increase or decrease in solubility

This rate of deterioration may increase with time but will certainly increase with the use of poor quality materials and techniques



CONSERVATION PRINCIPLES

FATG
Objective for Conservation Level Framing

To visually enhance artwork and offer a high level of protection from:

Physical and Mechanical Damage
Airborne Pollution
Acids

generated by framing materials, for approximately 20 years, under Normal Conditions

ARQADIA

CONSERVATION PRINCIPLES

FATG Conservation Level

Provide a HIGH level of Protection

Physical and Mechanical Damage

BIOLOGICAL

The biological threat directly related to moisture is mould growth.
It may cause irreversible and often devastating damage.

CHEMICAL

Oxidation - Chemical reaction with oxygen to form an oxide
sulpher dioxide, nitrogen oxides and ozone - basically atmospheric pollutants.

Hydrolysis - reaction of cellulose molecules with water
basically results in a loss of strength of paper - acid hydrolysis is a primary concern.

MECHANICAL

Fluctuations and extremes of conditions result in mechanical damage to materials.
e.g materials may become stiff or brittle when cold are more likely to break.
the expansion and contraction of materials.

Combination of these is a major cause of deterioration

CONSERVATION PRINCIPLES

FATG Conservation Level

Provide a HIGH level of Protection

Airborne pollution and acids generated by framing materials

Air Pollution

Off - Gassing

Release of substances sometimes as a result of degradation processes

ARQADIA

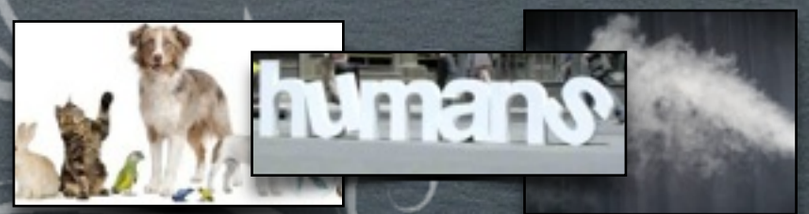
AIR POLLUTANTS

Air Pollutants in the form of:
gaseous contaminants or dust particles
can be particularly harmful and damaging

By-products of combustion
Nitrogen Dioxide

Formaldehyde

Other volatile organic compounds



Bio-aerosols

ARQADIA

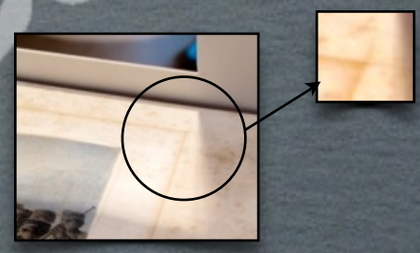
OFF-GASSING

The emission of harmful gasses from materials within the frame

Airborne oxides (Sulpher/Nitrogen) when combined with moisture produce acids that attack cellulose materials

Composition of woods, paper and boards change as they age producing different substances, including various acids which will increase the deterioration of artwork e.g

Breakdown of Lignin



Wood-burn

Discolouration of papers adjacent to poor quality boards

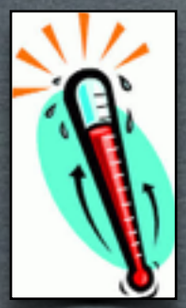
ARQADIA

CONSERVATION PRINCIPLES

FATG Conservation Level

FATG's Normal Conditions

Display	Out of Direct Sunlight
Temperature Range	10°c → 25°c
Relative Humidity	40% → 60%



ARQADIA

LIGHT

Light damage is most pervasive and difficult to avoid.
The degree of damage depends on two factors:

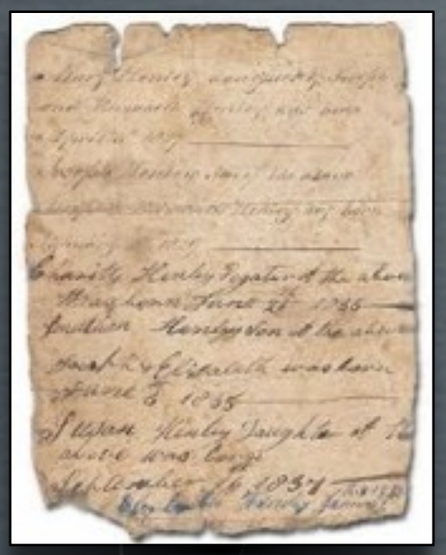
The intensity of the light source
Duration of exposure

Damage manifests itself in several ways

Causes cellulose materials to bleach, darken and yellow

Weakens and embrittles cellulose fibres

Causes pigments and dyes to fade and/or change colour



Yellowing and embrittlement of old paper

Trees appear blue due to the loss/fading of the yellow tones from the green

Light Damage is Cumulative and Irreversible

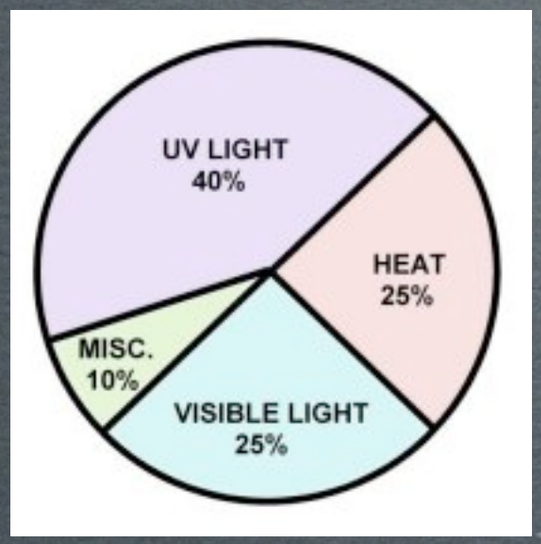
ARQADIA

FADING

UV Filters Do Not STOP Fading, They Help REDUCE Fading

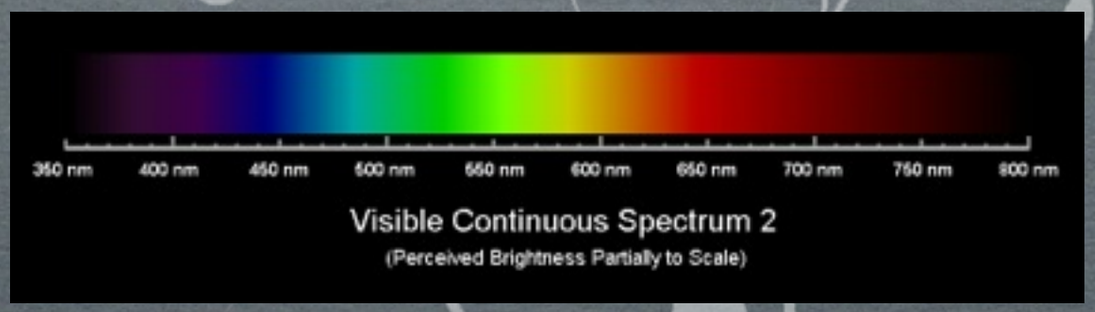
The cause of fading is due to a photochemical reaction involving UV and visible light

Research has shown that:



40% of fading is caused by UV rays.

25% being caused by normal visible light.



25% of fading is due to heat.

10% cause of fading is from indoor artificial lighting, humidity, and poor dye anchorage.

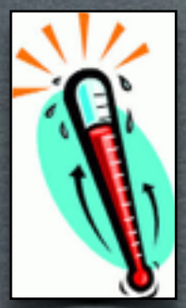
ARQADIA

CONSERVATION PRINCIPLES

FATG Conservation Level

FATG's Normal Conditions

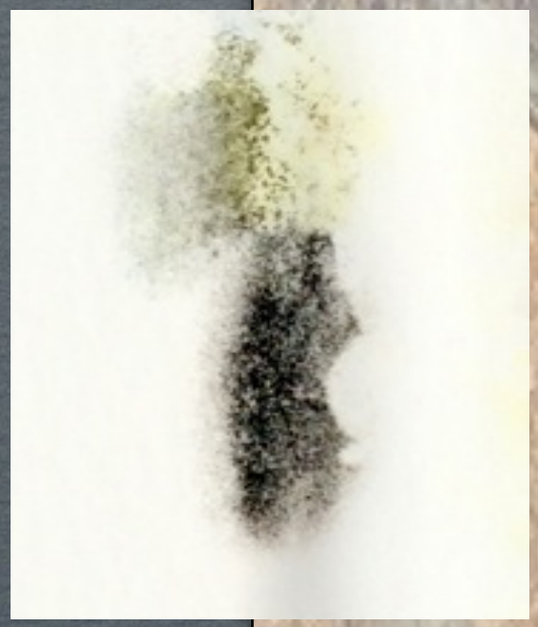
Display	Out of Direct Sunlight
Temperature Range	10°c → 25°c
Relative Humidity	40% → 60%



ARQADIA

HEAT

Heat has the eff deterioration.



- Cockli mulsions

Differential expansion of diums leads to cracking

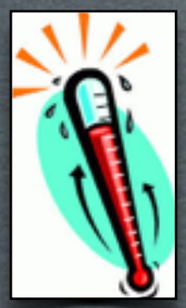
ARQADIA

CONSERVATION PRINCIPLES

FATG Conservation Level

FATG's Normal Conditions

Display	Out of Direct Sunlight
Temperature Range	10°c → 25°c
Relative Humidity	40% → 60%



ARQADIA

RELATIVE HUMIDITY

Major problem that contributes, influences and triggers many of the factors

Defined as the amount of moisture in the air compared to what the air can hold at a given temperature.

8.56ml

Cubic Metre

= Equilibrium =

50% RH
20C

100,000ml

Cubic Metre

RH changes cause dimensional changes to paper

RH greater than 70% fungal growth becomes possible e.g foxing

ARQADIA

CONSERVATION PRINCIPLES

L&A/COURIER/LOAN COPY

NATURAL HISTORY MUSEUM

Natural History Museum
Cromwell Road
London SW7 5BD
+44 (0)20 7942 5460

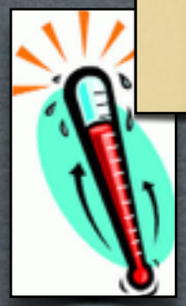
CONDITION STATEMENT FOR LOAN/EXHIBITION
LIBRARY AND INFORMATION SERVICES

LOAN/EXHIBITION TITLE:	A Great Endeavour. Joseph Banks, Lincolnshire Gentleman and his legacy		
OBJECT DETAILS			
LIBRARY ITEM ID NUMBER	NZ4/176 BOT	PLATE MARK NUMBER:	
DIMENSIONS (mm) HxWxD	735 x 573 (with mount) 505 x 335 (object)	DATE:	1783
TITLE/SUBJECT:	Phormium tenax	ARTIST/MAKER:	Nodder
OBJECT TYPE:	Watercolour drawing on laid	MATERIALS:	Watercolour

			FOR BOOKS:		
REQUIRED LIGHT LEVEL (PLEASE TICK):	≤50 lux	√	≤250 lux		>250 lux

ENVIRONMENT RANGE SHOULD BE AS BELOW:

RH: 40-60% RH Fluctuations: <5% per hour Temperature: 16-23° C UV Levels: 0µW/lumen



Dark stains (refer to image)
Ink annotations (artist's name and date) bottom LH corner

Verso

Watermark fleur de lis in the centre
Skinned areas at RH side and bottom LH side

MOUNTING REQUIREMENTS:

The object is mounted on museum board.
'V' hinged at top edge.

HANDLING (ALWAYS WASH HANDS OR WEAR NITRILE GLOVES):

Portrait mount, opening RH side. Item unframed. To be framed by borrowing institution

CONSERVATOR:	Konstantina Konstantinidou	DATE:	03/01/2014

Signature:

ARQADIA

CONSERVATION PRINCIPLES
Conclusions

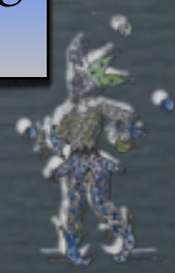
Good Quality Conservation framing can and does provide good protection from the afore-mentioned problems in most circumstances and when properly maintained.

However; problems may occur in the following situations

Extended exposure to high values of RH - effects may be limited by the use of Moistop and or Artsorb

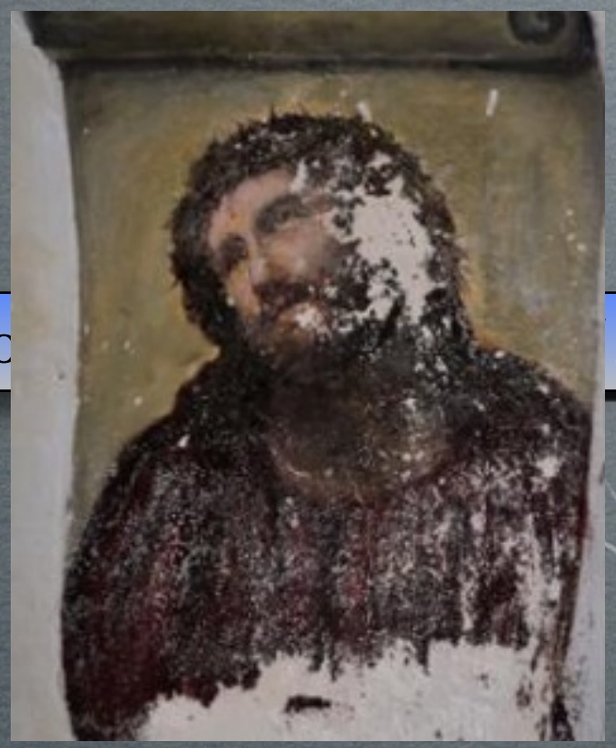
Exposure to direct sunlight resulting in high temperatures within the frame, this may increase the chemical deterioration rate and may cause ageing of the paper.

The interaction of microclimates and and macro climates is one of the key factors in understanding the relationship between Conservation and the environment

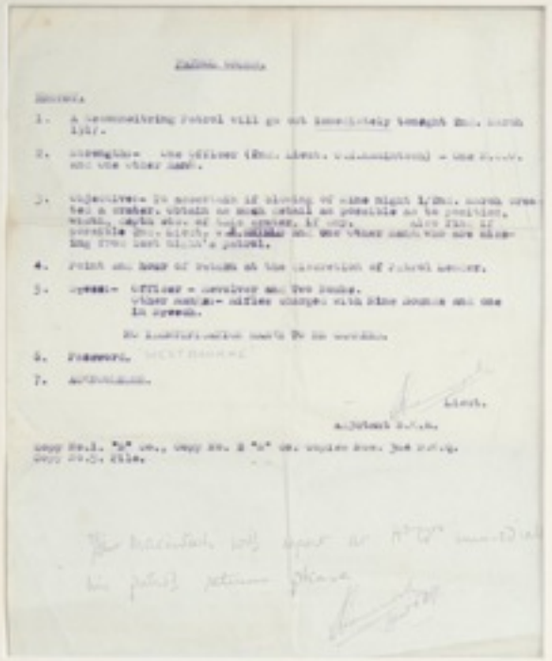


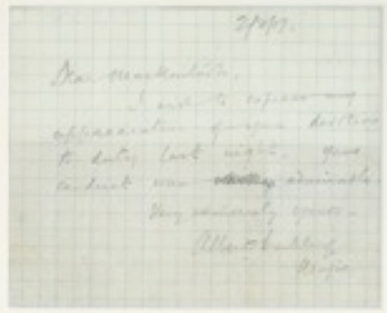
CONSERVATION PRINCIPLES

Conservation/Restoration



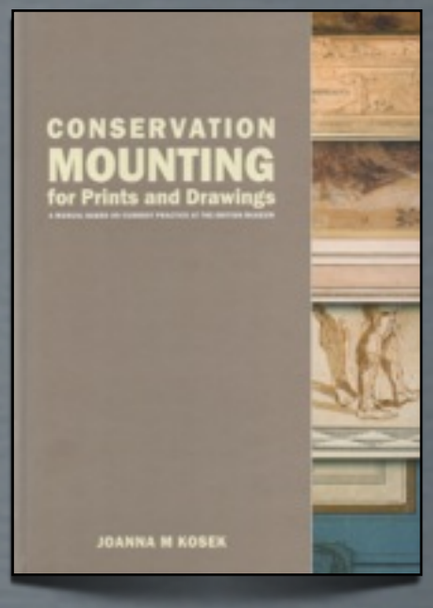
Resto returning an i dition





Continuing Professional Development

Ref: Conservation Mounting
by
Joanna M Kosek



Framing Workshops

Harlequin Frames, Lincolnshire

Textile, conservation & 3D framing workshops
Individually designed to meet your requirements

Contact: Mal Reynolds GCF Adv
01673860249
mal@harlequin-frames.co.uk