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TECHNICIAN TRAINING FOR THE CONSERVATION OF MOSAICS

PART 1
THE CONSERVATION OF IN SITU MOSAICS

Reburial



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Reburial

is a temporary or permanent
protection measure

A proper reburial protects a mosaic from:

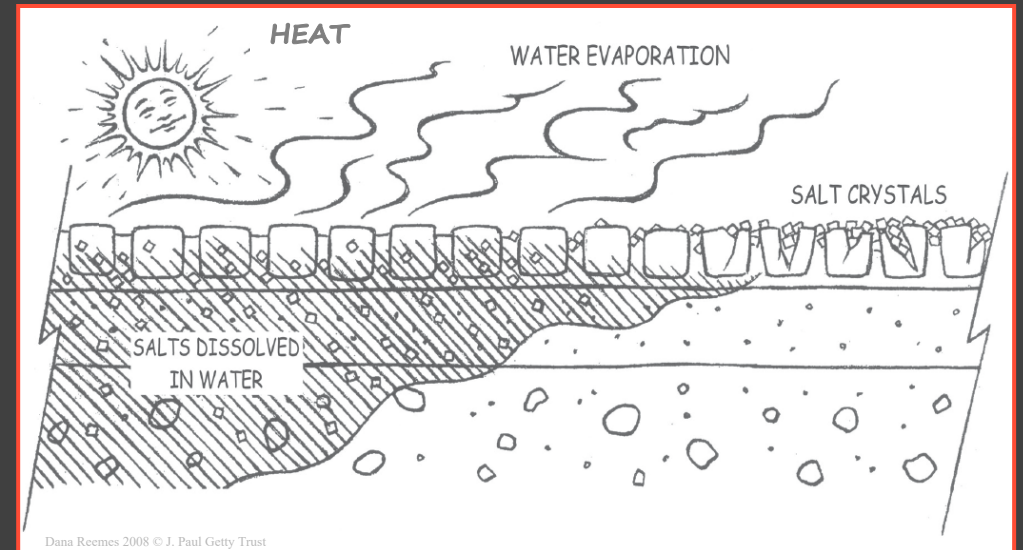
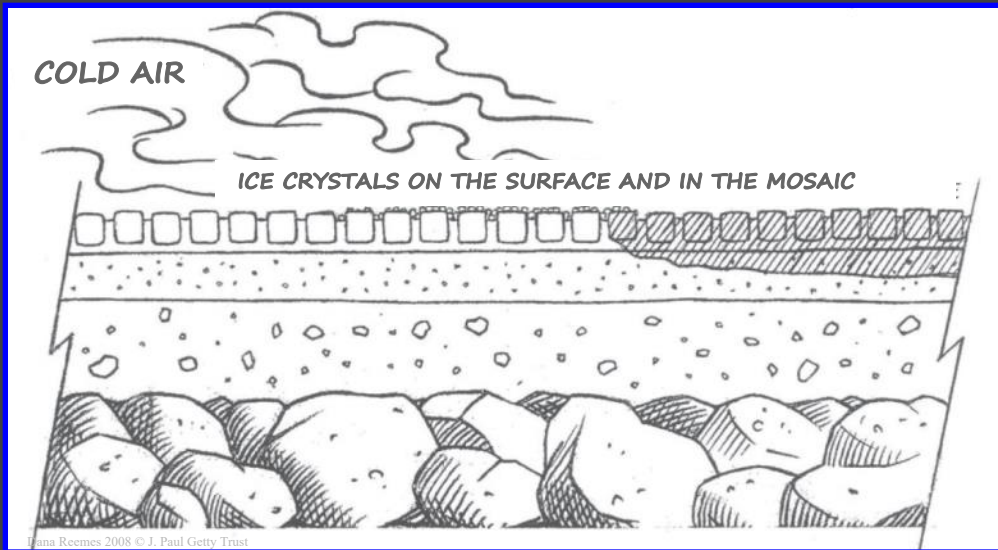
- direct action of atmospheric precipitation
- variations in temperature and humidity
- growth of vegetation
- foot traffic

Reburial is necessary when:

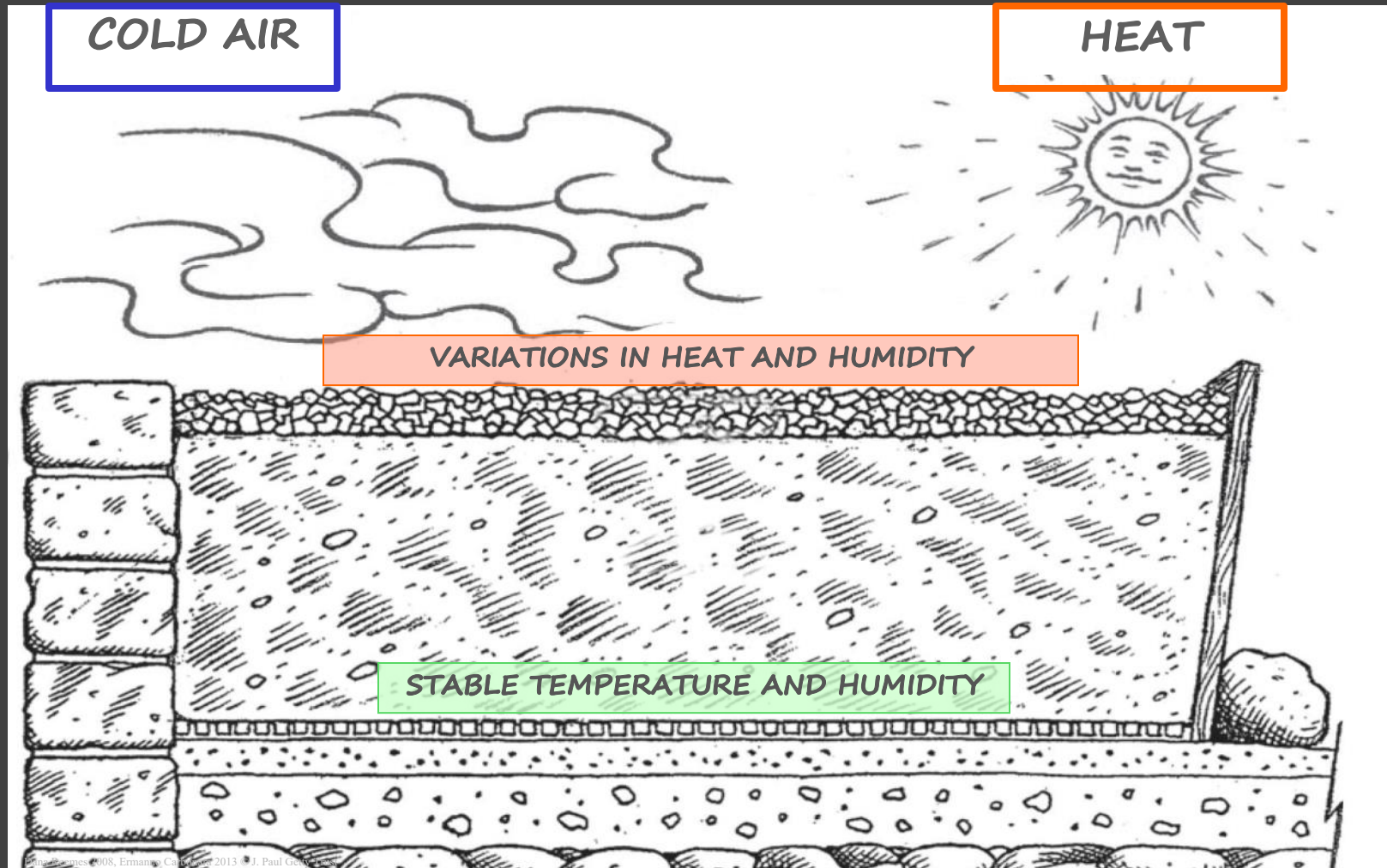
- resources for maintenance are lacking;
- other forms of protection (shelter, guard, fence, etc.) are lacking;
- the original materials of the mosaic are too damaged or are in an aggressive environment.

Protection from deterioration factors

Deterioration of an exposed mosaic
due to water and variations in temperature and humidity

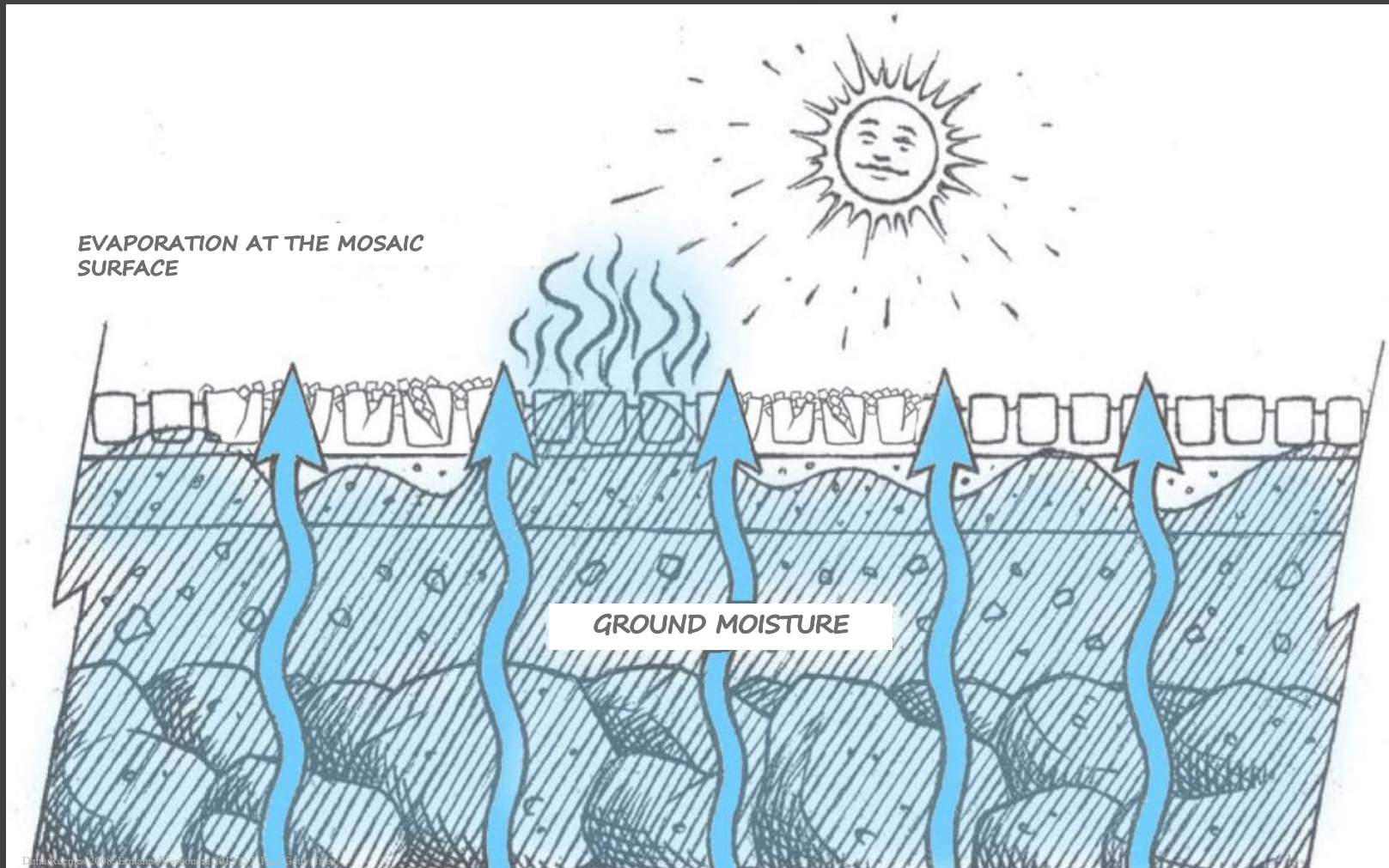


Change in level of variations in temperature and humidity

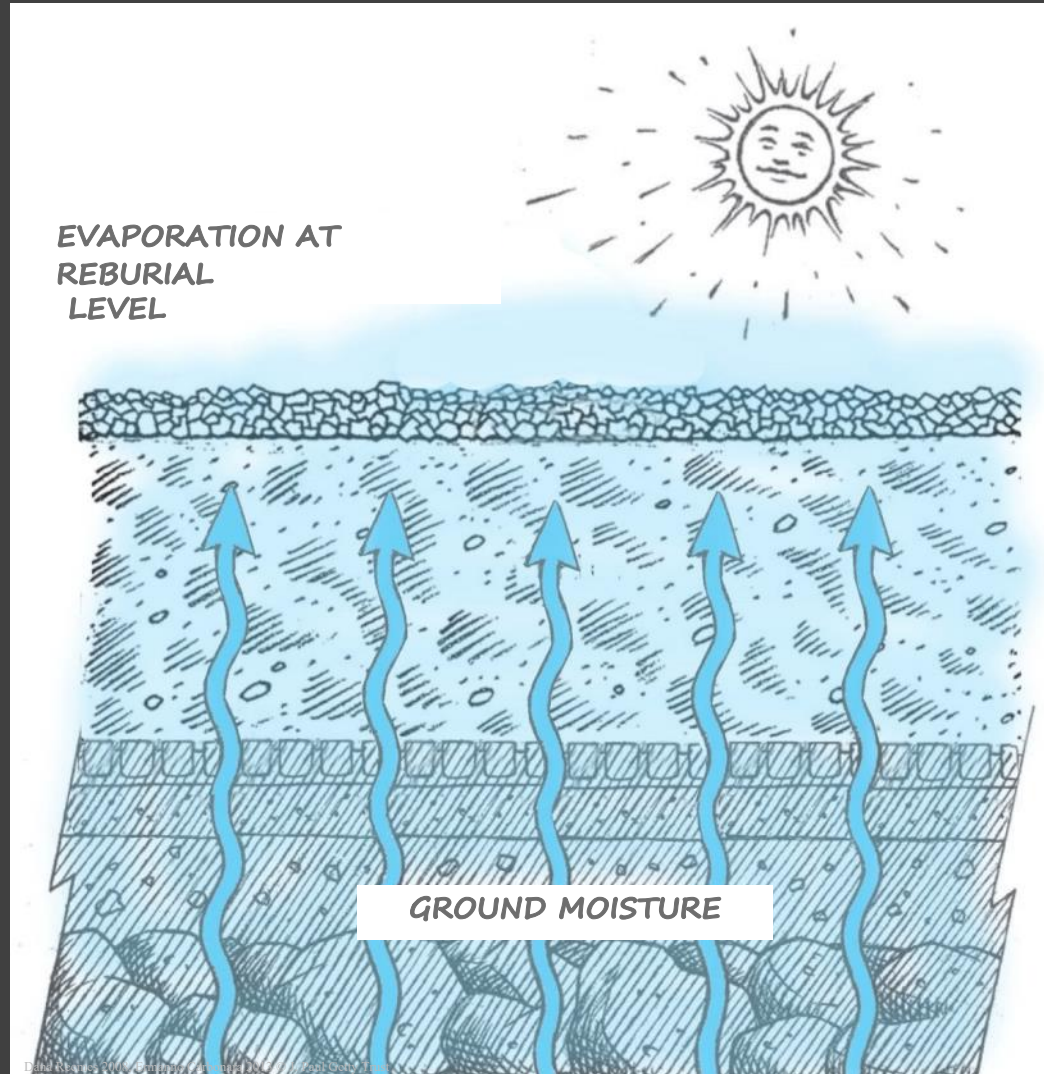


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Deterioration of an exposed mosaic due to capillary rise of water

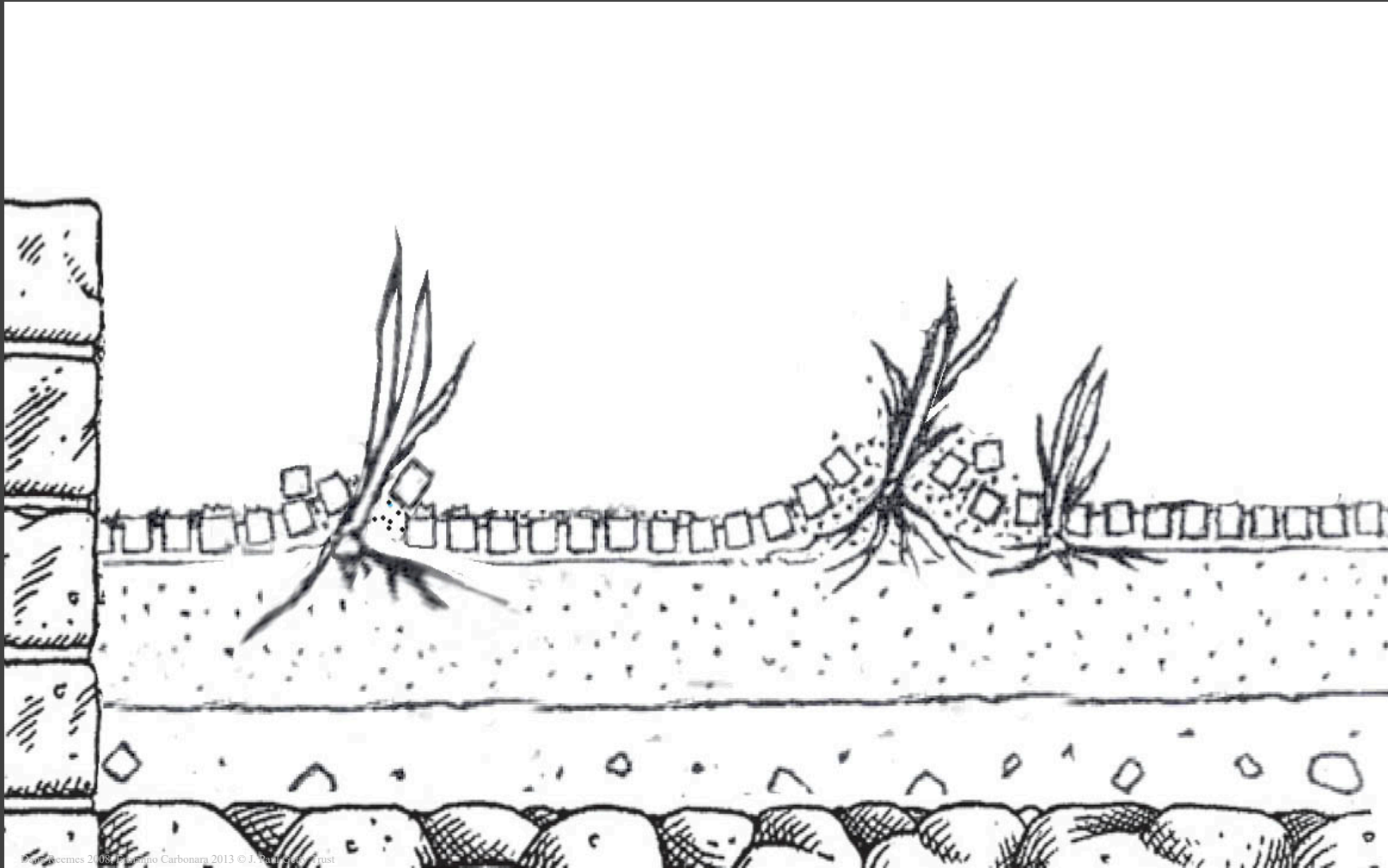


Change in level of water capillary rise



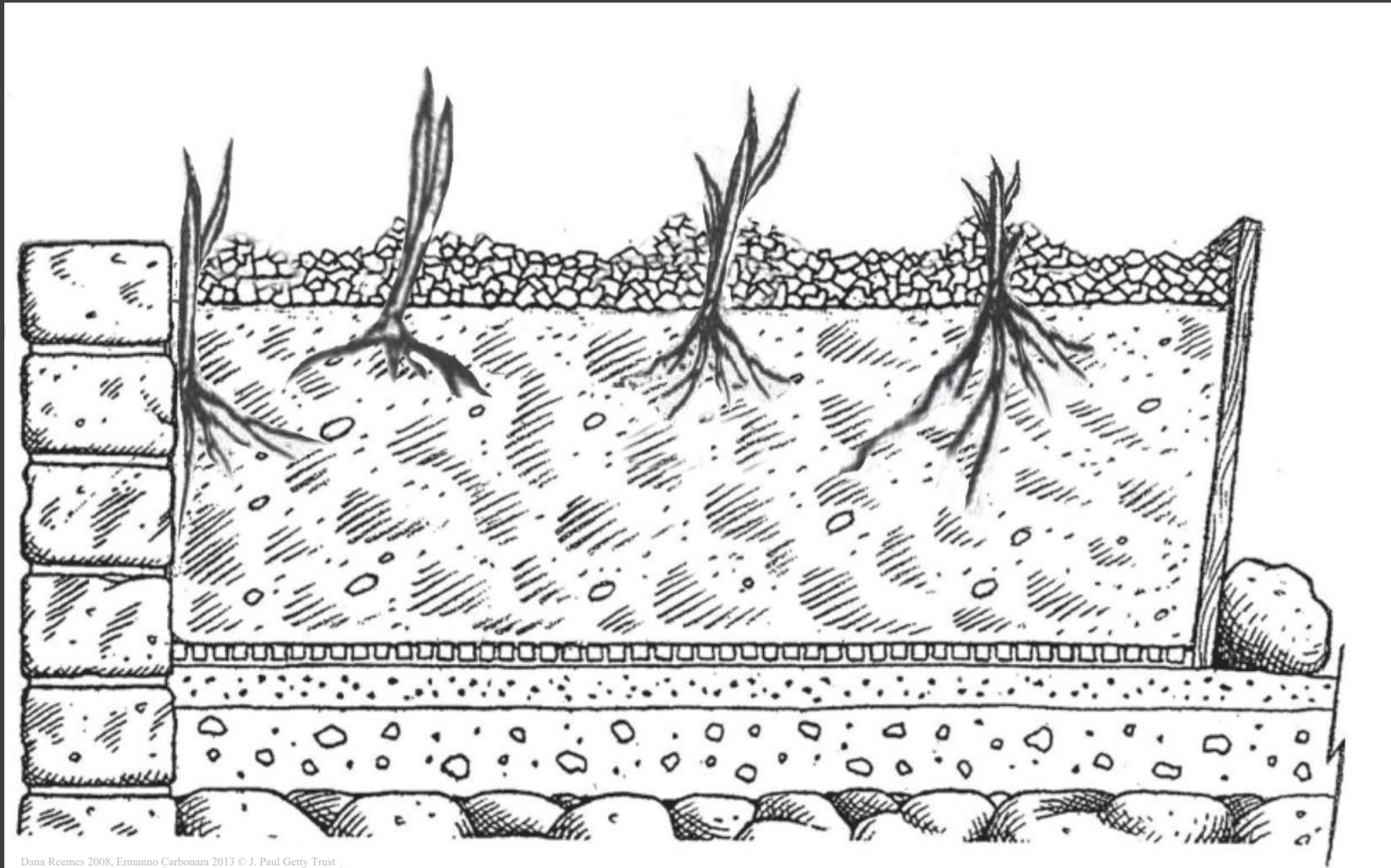
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Deterioration of an exposed mosaic due to vegetation growth



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Change in level of vegetation growth



Dana Reemes 2008, Ermanno Carbonara 2013 © J. Paul Getty Trust

Deterioration of an exposed in situ mosaic without maintenance and without protection



1970s



2009



William A. Graham © 1987, Margaret Alexander Papers, Dumbarton Oaks

1970s



Livia Alberti 2009 © J. Paul Getty Trust

2009



Bernard Poinssot © 1980, Margaret Alexander Papers, Dumbarton Oaks

1930s



William A. Graham © 1980, Margaret Alexander Papers, Dumbarton Oaks

1970s

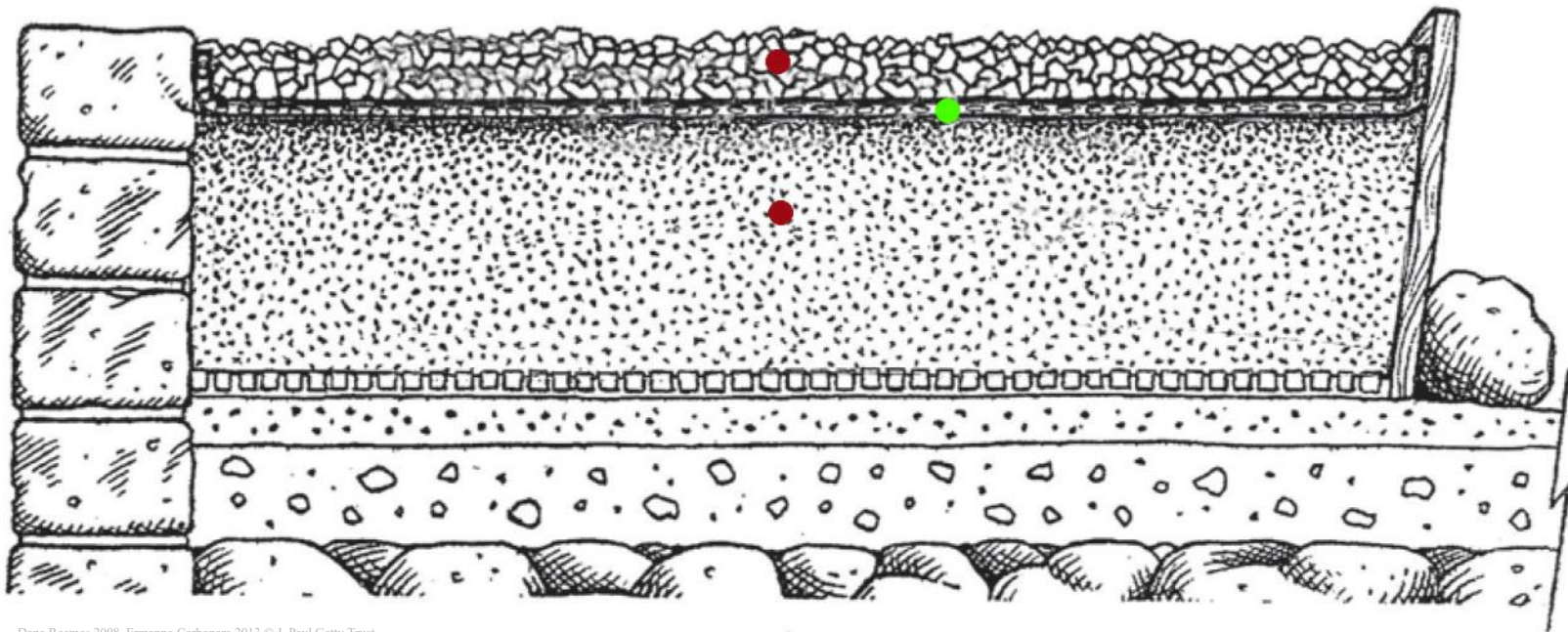


Livia Alberti 2006 © J. Paul Getty Trust

2006

Reburial generally consists of
fill materials
and
separation membranes

- FILL MATERIALS
- SEPARATION MEMBRANES



Dana Reemes 2008, Ermanno Carbonara 2013 © J. Paul Getty Trust

Materials for reburial

Fill materials

Soil
Sand
Gravel
Other natural and synthetic materials

Separation membranes

Plastic sheeting
Plastic netting
Woven plastic sheeting
Non-woven geotextiles
Other synthetic fabrics

Fill materials



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Livia Alberti 2012 © J. Paul Getty Trust



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Soil



Ermanno Carbonara 2012 © J. Paul Getty Trust

Sand

Fill materials



Gravel



Pozzolana

Fill materials



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Expanded clay



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Expanded polystyrene

Fill Materials

Type	Advantages	Disadvantages
Soil	<ul style="list-style-type: none"> • Allows continuous water transport • Maintains good moisture and temperature stability • Readily available and inexpensive 	<ul style="list-style-type: none"> • Contains seeds and small plants • Prone to vegetation growth and animal activity • Difficult to remove from the mosaic surface
Sand	<ul style="list-style-type: none"> • Less prone to vegetation growth and animal activity • Maintains fairly stable moisture and temperature levels • Clean • Readily available and inexpensive 	<ul style="list-style-type: none"> • Limits the continuous movement of water • Can contain salts
Gravel	<ul style="list-style-type: none"> • Less prone to vegetation growth and animal activity • Clean • Easy to remove • Readily available and inexpensive 	<ul style="list-style-type: none"> • Inhibits the continuous movement of water • Poor moisture and temperature stability • Hard with sharp edges • Heavy
Other natural materials (<i>pozzolana</i> , "tiff", etc.)	<ul style="list-style-type: none"> • Allows continuous water transport • Maintains fairly stable moisture and temperature levels • Inexpensive near their place of extraction • For "tiff", less prone to vegetation growth 	<ul style="list-style-type: none"> • Dirties the mosaic surface • Hard to remove from the mosaic surface • Not available everywhere • For "tiff", can create concretions on the mosaic surface
Specialized synthetic materials (<i>Expanded clay – Leca™</i> , <i>expanded polystyrene</i> , etc.)	<ul style="list-style-type: none"> • Less prone to vegetation growth and animal activity • Clean • Very easy to remove • Lightweight 	<ul style="list-style-type: none"> • Inhibits the continuous movement of water • Poor moisture and temperature stability • Hard to obtain and expensive

Separation membranes



Plastic sheeting



Plastic netting

Separation membranes



Ermanno Carbonara 2019 © J. Paul Getty Trust



Ermanno Carbonara 2019 © J. Paul Getty Trust

Woven plastic sheeting



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Non-woven geotextiles

Separation Membranes

Type	Advantages	Disadvantages
Plastic sheets	<ul style="list-style-type: none"> • Partially effective against vegetation penetration and animal activity • Effective separation between all fill materials • Easily available and inexpensive 	<ul style="list-style-type: none"> • Inhibits liquid-water/water-vapor transport • Promotes root growth underneath
Plastic netting	<ul style="list-style-type: none"> • Permits liquid-water/water-vapor transport • Does not promote root growth underneath • Easily available and inexpensive 	<ul style="list-style-type: none"> • Ineffective barrier to vegetation penetration and animal activity • Ineffective separation of smaller fill particles
Woven plastic sheeting	<ul style="list-style-type: none"> • Effective separation between all types of fill materials • Easily available and inexpensive 	<ul style="list-style-type: none"> • Reduces liquid-water /water-vapor transport • Fairly ineffective barrier to vegetation penetration and animal activity • Promotes growth of roots underneath
Non-woven geotextiles and other synthetic fabrics	<ul style="list-style-type: none"> • Permits water-vapor transport • Partially effective against vegetation penetration and animal activity • Effective separation between all types of fill materials 	<ul style="list-style-type: none"> • Reduces liquid-water transport • Promotes growth of roots underneath • Hard to obtain and very expensive

Examples of reburial



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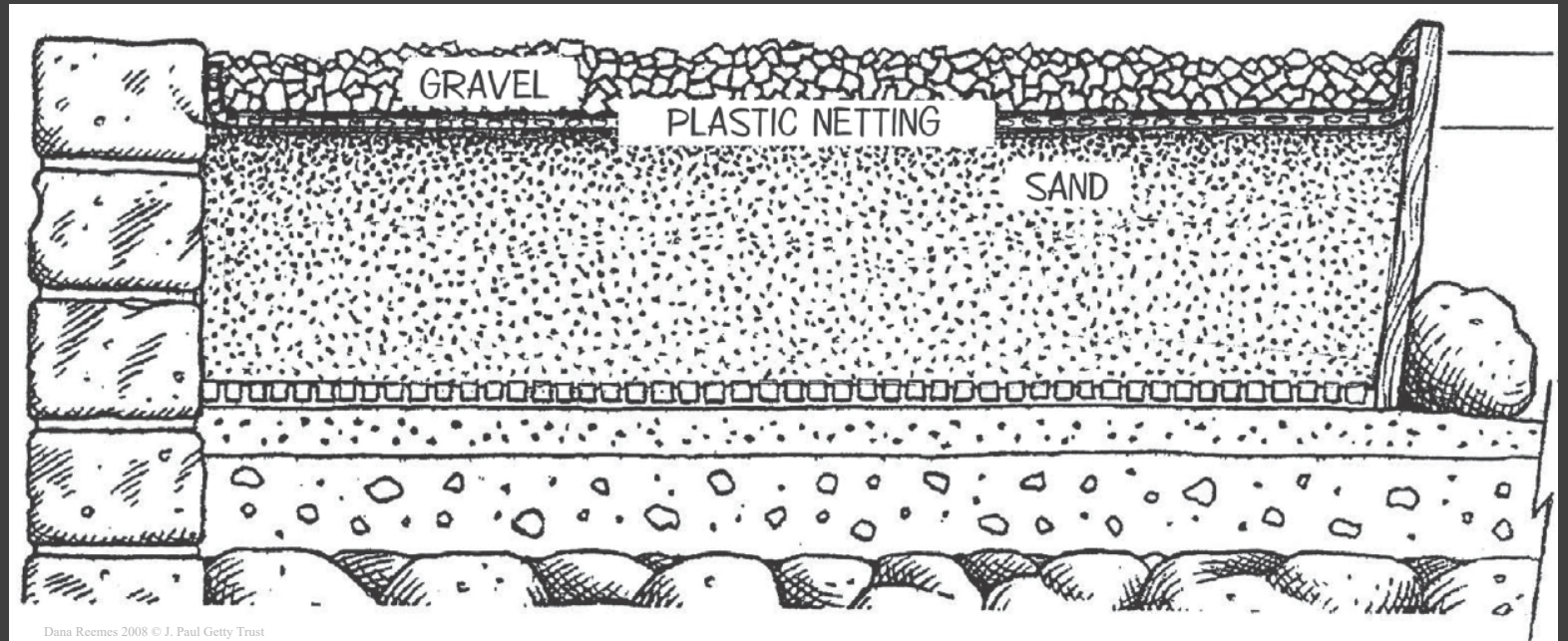
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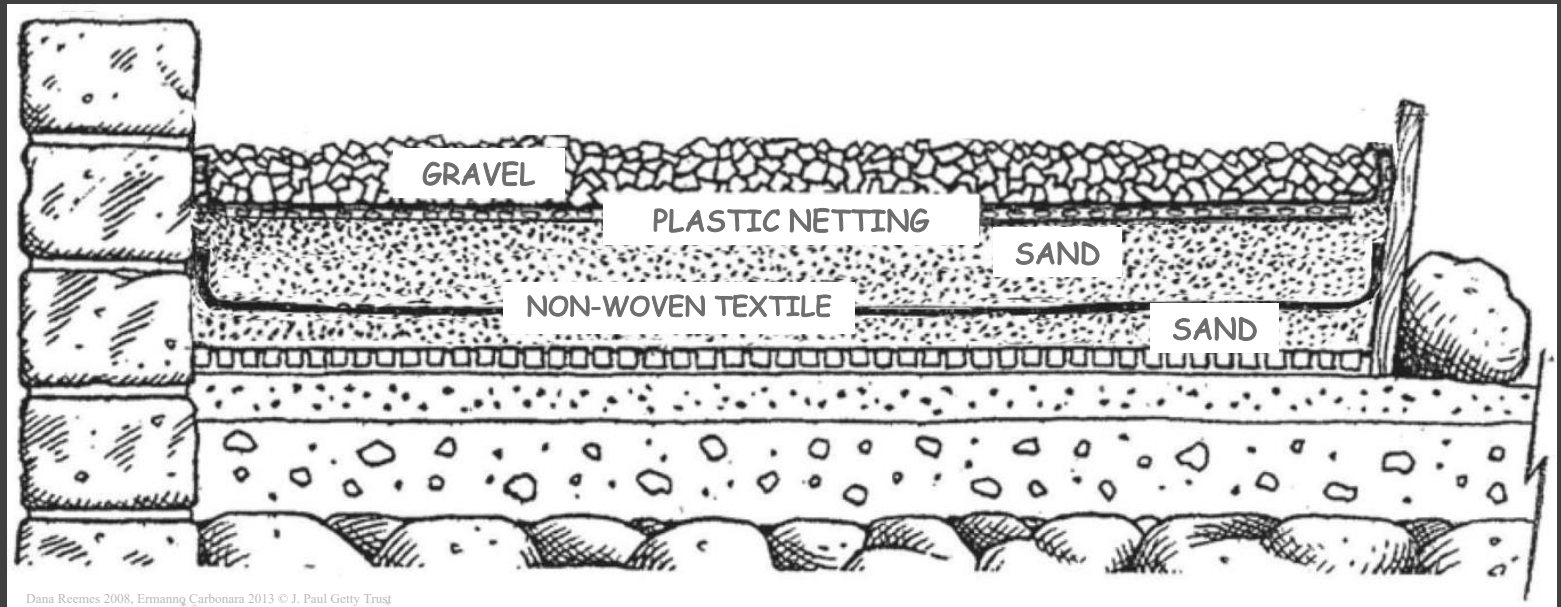
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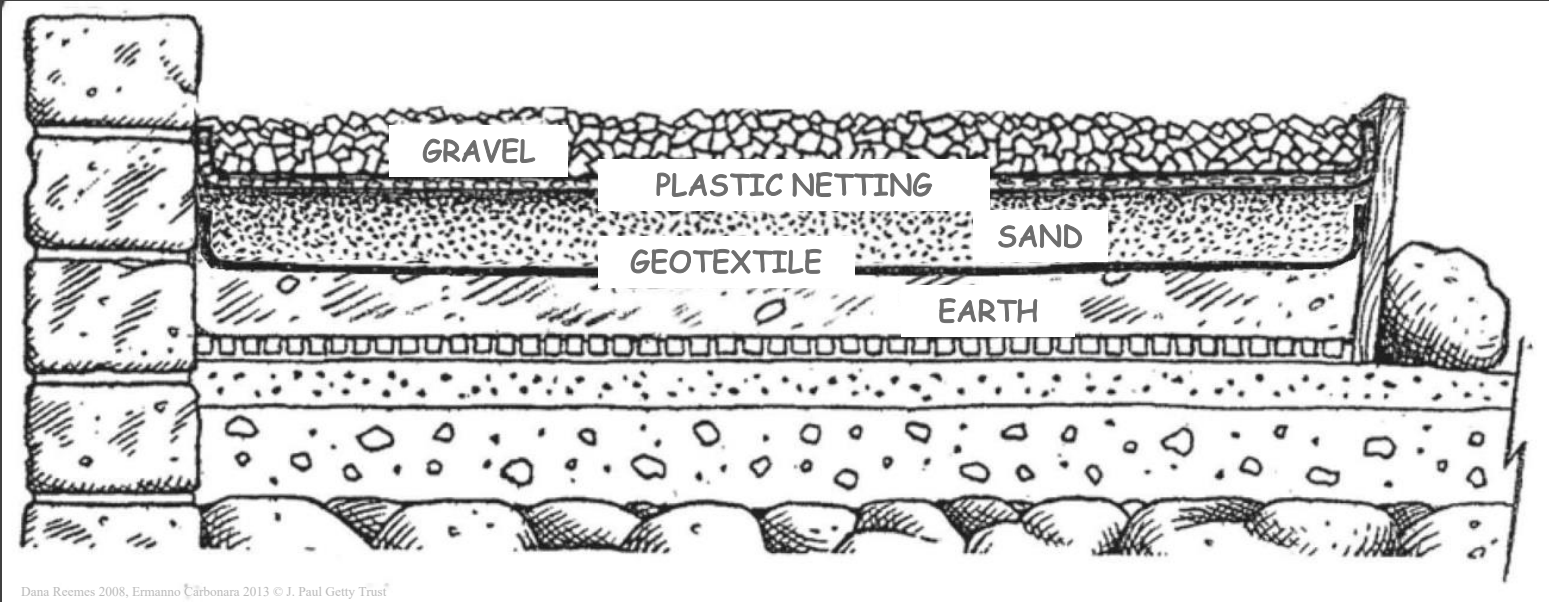


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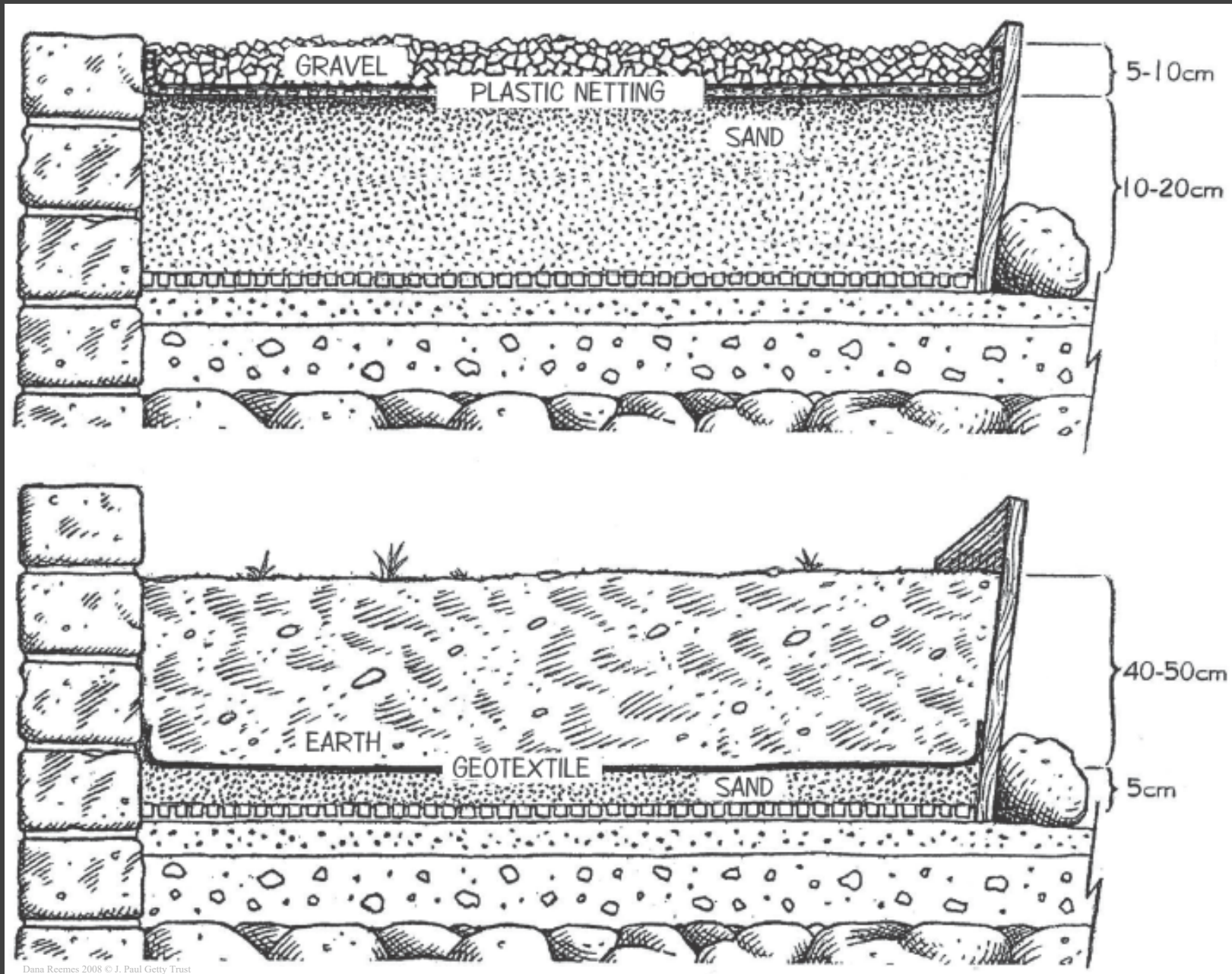


Dana Reemes 2008 © J. Paul Getty Trust

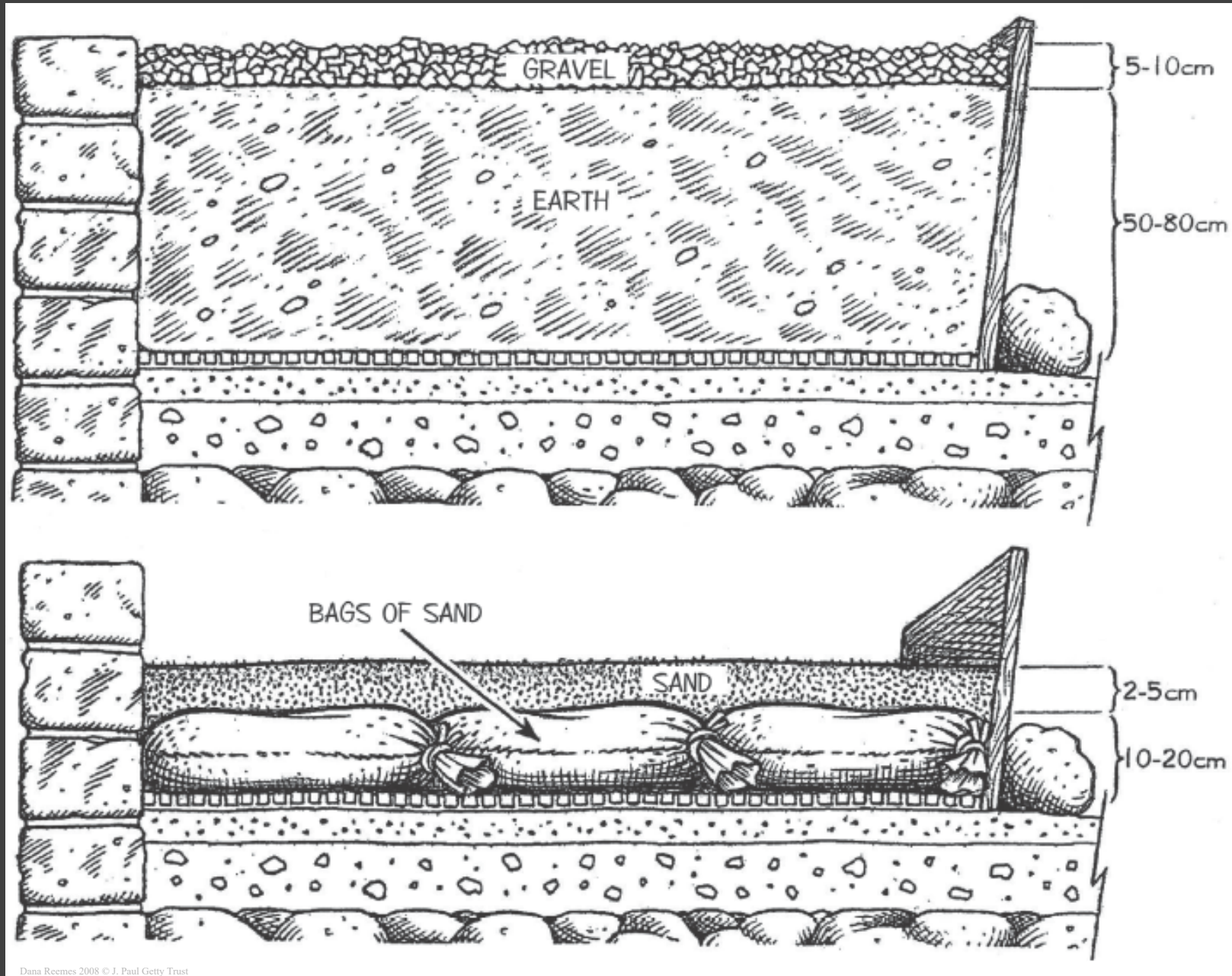




Thickness



Thickness



Containment of fill materials

Dry stone wall



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Containment of fill materials

Dry stone barrier



Emanno Carbonara 2010 © J. Paul Getty Trust

Containment of fill materials

Barrier of stones set in mortar with open joints for drainage



Containment of fill materials

Row of stones set in mortar



Livia Alberti 2009 © J. Paul Getty Trust

Containment of fill materials

Stones and geotextile



Ermanno Carbonara 2012 © J. Paul Getty Trust

Containment of fill materials

Wooden plank barrier



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Containment of fill materials

Wooden plank frame



Livia Alberti 2009 © J. Paul Getty Trust

Containment of fill materials

Wooden plank frame supported by metal pipes



Livia Alberti 2008 © J. Paul Getty Trust

Poor practice to be avoided

Lack of reburial maintenance



presence of vegetation



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Insufficient depth of reburial fill



root growth in the mosaic



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Lack of containment barriers



loss of fill materials



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Lack of containment barriers → exposure and deterioration of separation membranes



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Separation membrane in direct contact with mosaic → growth of roots under the membrane



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Reburial with fill material in contact
with unstabilized mosaic



loss of original location of tesserae



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Livia Alberti 2013 © J. Paul Getty Trust

Reburial with membrane in contact
with unstabilized mosaic



growth of roots between tesserae



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Reburial: an effective management tool for the conservation of in situ mosaics.



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MOSAIKON is a partnership of four institutions: the Getty Conservation Institute, the Getty Foundation, ICCROM, and ICCM. The aims of the project are to strengthen the network of professionals concerned with the conservation, restoration, maintenance, and management of mosaic heritage in the southern and eastern Mediterranean region; provide training to a variety of individuals involved in mosaics conservation and, more generally, with the management of archaeological sites and museums with mosaics; work with national and international bodies to provide a more favorable legislative, regulatory, and economic environment for the conservation of mosaics in the Mediterranean; and promote the dissemination and exchange of information.

