

# Archaeoethanatology as a method:

## how to reconstruct a burial

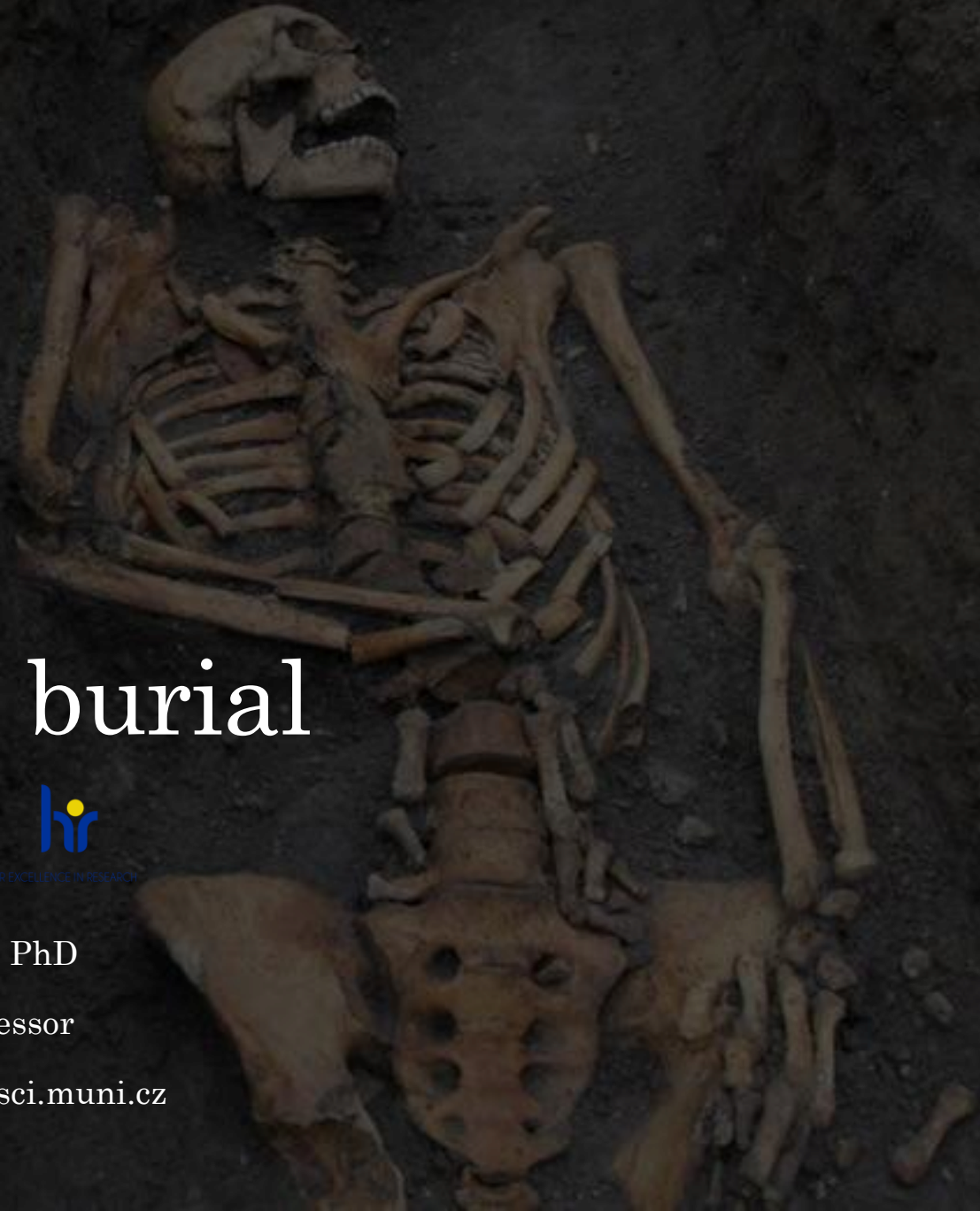
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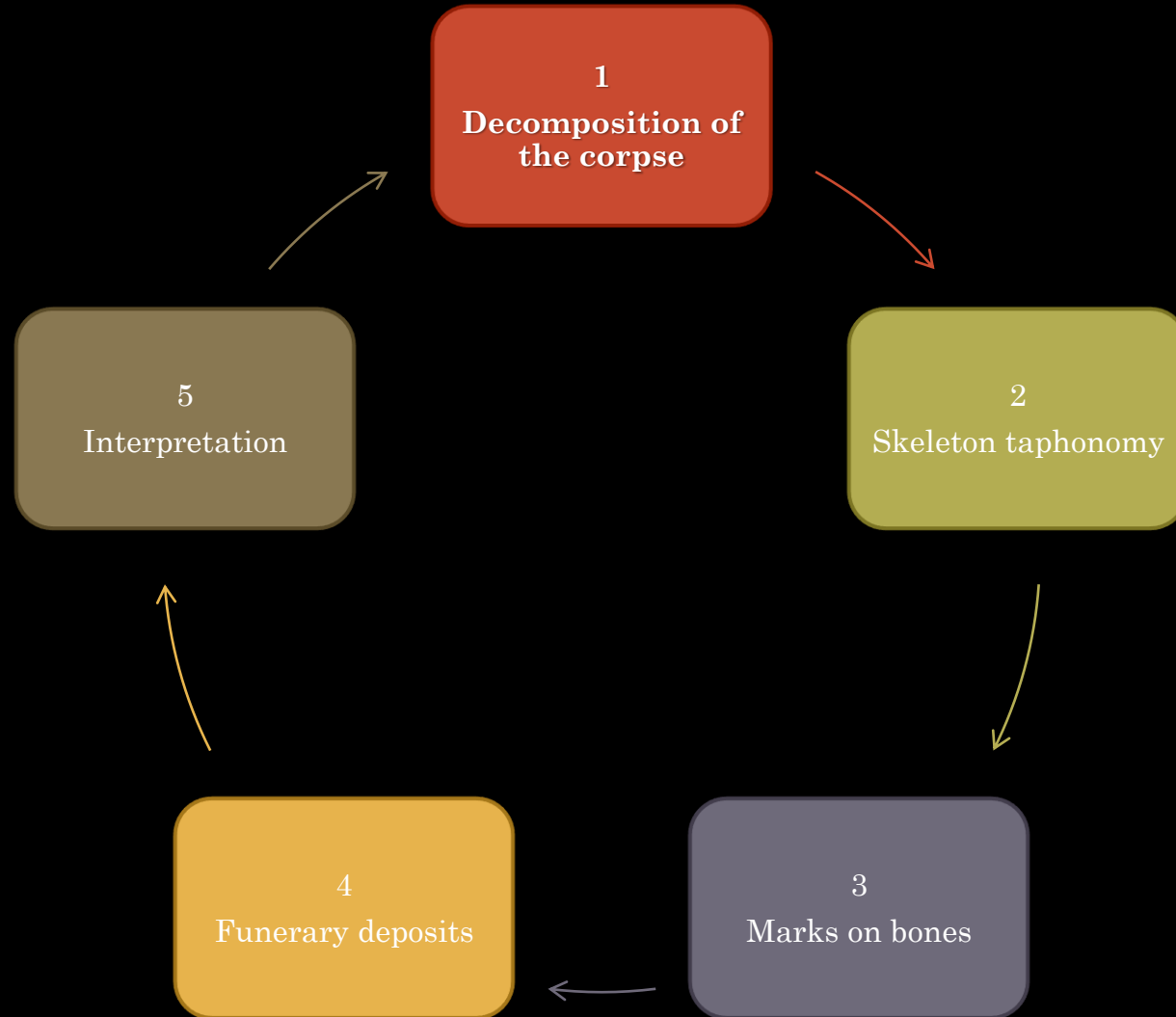
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# Archaeoethanatology





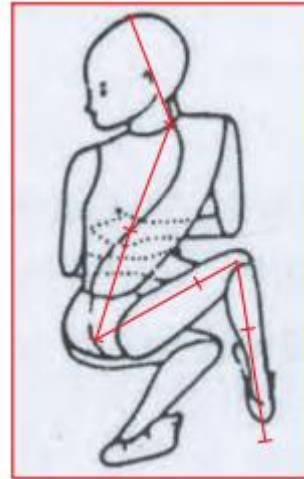


Fig. 16: Excavationplan of baby, Henry Dудay, legend by SG  
— Head length



Fig. 17: Excavationplan of baby, Henry Dудay, legend by SG  
— Head length

# Recording: in the field

**FICHE DE CONSERVATION : SUJET IMMATURE**

Année:  Site:  N° squelette:  N° opération:  Auteur:

**CONSERVATION OSSEUSE**

Région présente et identifiée avec certitude  
 Région fragmentée  
 Situation exacte inconnue avec certitude  
 Droite ou Gauche ?

**LEGENDE DES DIAGRAMMES DENTAIRES**

Germe présent in situ  
 Germe présent mais isolé  
 Un de ces élément est présent  
 L'identification de l'élément isolé n'est que supposée  
 Elément présent in situ  
 Elément isolé présent et identifié avec certitude  
 Agénésie dentaire  
 Dent perdu ante mortem (Résorption alvéolaire)

**Commentaires**

Cervicales Thoraciques Lombaires

Sép. intacte    Esp. vide  
 Sép. remaniée    Esp. colmale  
 Sép. détruite    ?

U.P.A. 376 CNRS d'après T. S. Constantopoulos, Westermann et C. Meckelohr, modifié par P. Courtaud, H. Duday et M. Guillou. Informatisation M. Coureau (AC-AN)

**Crâne**

Face d'apparition Indiquer l'ordre par un n°

Antérieure <input type="checkbox"/>	Postérieure <input type="checkbox"/>	Supérieure <input type="checkbox"/>	Inférieure <input type="checkbox"/>	Latérale G <input type="checkbox"/>	Latérale D <input type="checkbox"/>
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Connexions	Crâne Atlas	Atlas Axis	Crâne Mandib.
Etroite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lâche	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Déplacée	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Position du crâne: Primaire  Secondaire  ?

Coussin funéraire:   
 Surélévation:

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**RACHIS cervical**

Connexions: Etroites  Lâches  Déplacées

**thoracique**

Connexions: Etroites  Lâches  Déplacées

**lombaire**

Connexions: Etroites  Lâches  Déplacées

**sacro-coccygien**

Connexions: Etroites  Lâches  Déplacées

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**Thorax**

Connexions: Etroites  Lâches  Déplacées

Mise à plat: Complète  Incomplète

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**Ceinture scapulaire**

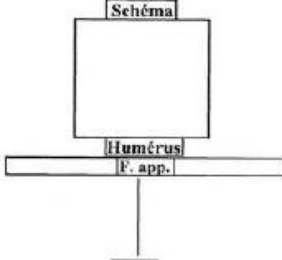
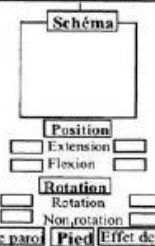
Connexions scapulo-humérales: Etroites  Lâches  Déplacées

Compression: Oui  Non

Position clavicules:

P. COURTAUD, U.P.A. CNRS, I.N.H. Anthropologie, Université, Bordeaux

# Recording in the field

<b>Connexions</b> Etroites Lâches Déplac. Coude <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Carpe <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Métacarpe <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<b>D Membres supérieurs</b> <b>G</b> Symétriques <input type="checkbox"/> Asymétriques <input type="checkbox"/> Schéma 	<b>Connexions</b> Etroites Lâches Déplac. Coude <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Carpe <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Métacarpe <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>Disposition</b> Sur bassin <input type="checkbox"/> Sous bassin <input type="checkbox"/> ? Vert. Palm. Dors. Epauule <input type="checkbox"/> Thorax <input type="checkbox"/> Abdomen <input type="checkbox"/> Pubis <input type="checkbox"/> Fémur <input type="checkbox"/> Autre <input type="checkbox"/>		<b>Main</b> F. app. ? Vert. Palm. Dors.	<b>Disposition</b> Sur bassin <input type="checkbox"/> Sous bassin <input type="checkbox"/> Epauule <input type="checkbox"/> Thorax <input type="checkbox"/> Abdomen <input type="checkbox"/> Pubis <input type="checkbox"/> Fémur <input type="checkbox"/> Autre <input type="checkbox"/>	
<b>Ceinture pelvienne</b> Fermée <input type="checkbox"/> Semi-ouverte <input type="checkbox"/> Ouverte <input type="checkbox"/>		<b>Connexions coxo-fémorales</b> Etroites Lâches Déplacées Oui <input type="checkbox"/> Non <input type="checkbox"/>		
<b>Connexions</b> Etroites Lâches Déplac. Genou <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Cheville <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Métatarse <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<b>D Membres inférieurs</b> <b>G</b> Symétriques <input type="checkbox"/> Asymétriques <input type="checkbox"/> Schéma 	<b>Connexions</b> Etroites Lâches Déplac. Genou <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Cheville <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Métatarse <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Non <input type="checkbox"/> Oui <input type="checkbox"/> Effet de paroi <input type="checkbox"/>		<b>Pied</b> Effet de paroi: Oui <input type="checkbox"/> Non <input type="checkbox"/>		

OBSERVATIONS GENERALES <input type="checkbox"/> Z. pieds <input type="checkbox"/> Z. crâne <input type="checkbox"/>																			
<b>Position générale</b>																			
<b>Orientation</b>																			
<b>Etat</b> <table border="1"> <tr> <th colspan="3">Représentation</th> <th colspan="3">Conservation</th> </tr> <tr> <td>Bonne</td><td>Moyenne</td><td>Mauvaise</td> <td>Bonne</td><td>Moyenne</td><td>Mauvaise</td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>		Représentation			Conservation			Bonne	Moyenne	Mauvaise	Bonne	Moyenne	Mauvaise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Représentation			Conservation																
Bonne	Moyenne	Mauvaise	Bonne	Moyenne	Mauvaise														
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
<b>Décomposition</b> Espace vide <input type="checkbox"/> Espace colmaté <input type="checkbox"/> ? <input type="checkbox"/>																			
Eléments d'architecture funéraire: (calage, clous cercueil, épingles,...)																			
<b>Fond</b> Fosse sépulcrale <input type="checkbox"/> Etroite <input type="checkbox"/> Large <input type="checkbox"/> ? <input type="checkbox"/> Cuvette <input type="checkbox"/> Plat <input type="checkbox"/> ? <input type="checkbox"/>																			
<b>Compression</b> Non <input type="checkbox"/> Epaules <input type="checkbox"/> Bassin <input type="checkbox"/> Autres <input type="checkbox"/>																			
Sexe <input type="checkbox"/> Masculin <input type="checkbox"/> Féminin <input type="checkbox"/> Indéterm. <input type="checkbox"/>	Age Adulte <input type="checkbox"/> Immature <input type="checkbox"/>																		
<b>Pathologie</b>	<b>Variations morphologiques</b>																		
<b>Longueurs des grands os longs</b> (si conservation trop mauvaise)																			
Fémur <input type="checkbox"/> L. max. <input type="checkbox"/> L. phys. <input type="checkbox"/>	Humérus <input type="checkbox"/> L. max. <input type="checkbox"/> L. phys. <input type="checkbox"/>																		
Tibia <input type="checkbox"/> L. max. <input type="checkbox"/> L. phys. <input type="checkbox"/>	Radius <input type="checkbox"/> L. max. <input type="checkbox"/> L. phys. <input type="checkbox"/>																		

P. COURTAUD URA 376 CNRS - Lab. Anthropologie - Université Bordeaux I

# Recording: post excavation

## Hamoukar Expedition

Locus Database (default sheet) prev next

locus identification Browse Find Add Delete flag

menu items new items Browse Omit Omitted Sort Unsort

Season  Area  Square  Operation

Locus Number  date opened  date closed  excavator


basic data stratigraphic placement description supplementary information field records

Burial 144 was found adjacent to 135 (to the south) and 126 (to the east). It appeared to be continuous with 135, and may have been-- if all the burials were included in the same cut, which remains a possibility-- continuous with 126, 130, 133, 127, 146, and 174 as well.


Like the others, 144 was pointed North. it had fewer inclusions, however, including two jars. The fill for the burial was mixed ashy and m.b. collapse and wash, and contained a few potsherds and animal bones-- these are of tertiary context, like the other burials.

texture

field photos lots objects



IMG\_0973.JPG



IMG\_0975.JPG

# Recording: Create a system

<b>burial</b>	
<b>Location</b>	Location and stratigraphic relationships
<b>Tomb</b>	Orientation, architectural form and nature of the filling.
<b>Elevation (m)</b>	The highest and lowest points of the burial.
<b>Dating</b>	Phase et stratum.
<b>human remains</b>	
<b>Preservation</b>	Good, average or bad.
<b>Description</b>	Relative positioning by anatomical segment (skull, vertebrae and thorax, shoulder girdle, arms, pelvic girdle and legs) noting the presence or the absence of the anatomical joints.
<b>Body orientation</b>	From head to feet.
<b>Biology</b>	Estimation of age and determination of sex.
<b>grave goods</b>	
Nature and quantity of offerings, position in the tomb and in relation to the corpse.	
<b>taphonomical analyses and interpretation</b>	
Discussing (based on the previous description of the human remains) the corpse taphonomy, defining the type of the funerary deposits, analysing the environmental conditions within the burial, exposing the differences between the original burial and the form of the deposit observed at excavation	



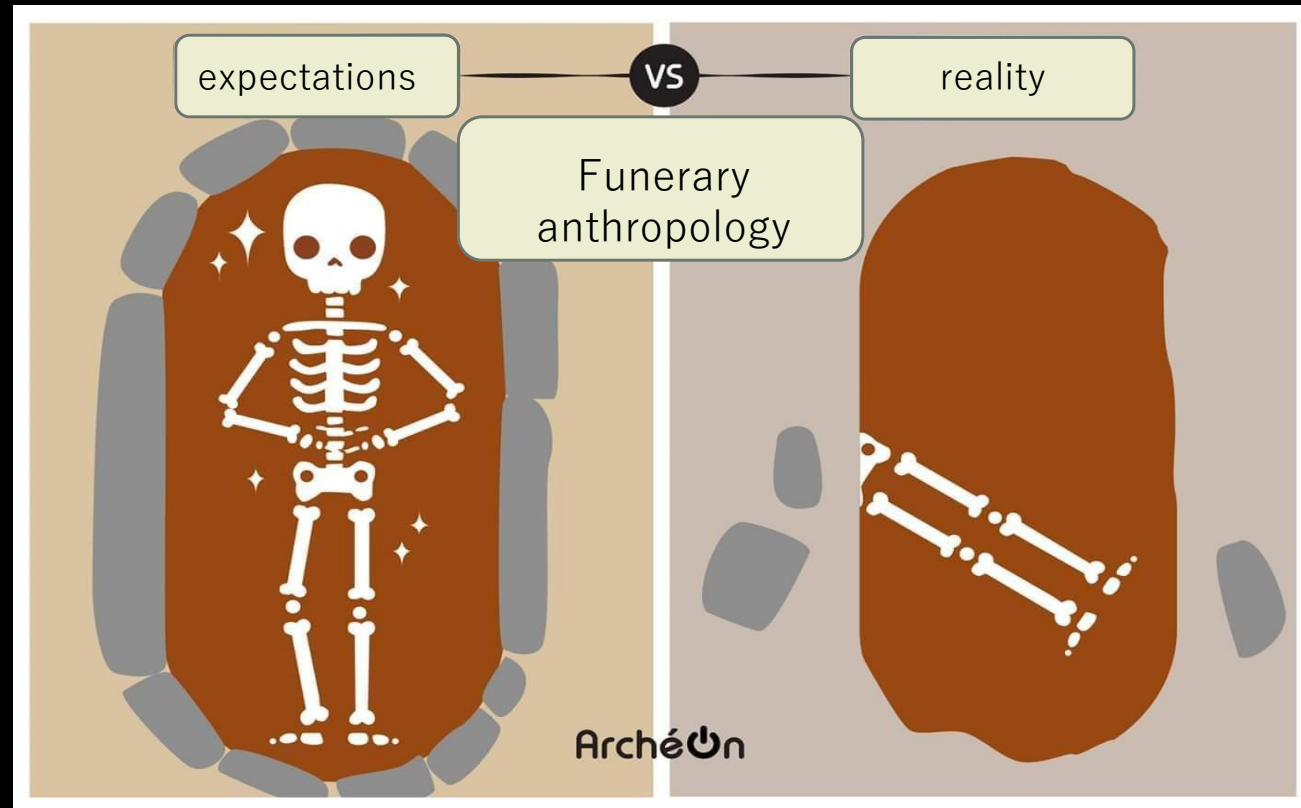
# How to **reconstruct** a burial?

Define if it is :

1. Primary or secondary?
2. Single, multiple or collective burial?
3. Decomposition in a void or a filled space ?



# ➡ Different categories of funerary deposits



1. Primary or secondary?

2. Single, multiple or collective?

3. Decomposition in a void or a filled space ?

# ➡ Different categories of funerary deposits

- **Primary burial** "simple funeral" = a single ceremony during which the manipulation of the remains takes place. The body, still in a state of anatomical integrity, is then placed in its final tomb. Decomposition happens almost entirely at the place of burial



# Primary burial

1. observation of the **anatomical connections**
2. more precisely of the **labile type joints**
3. some connections give way **faster than others**

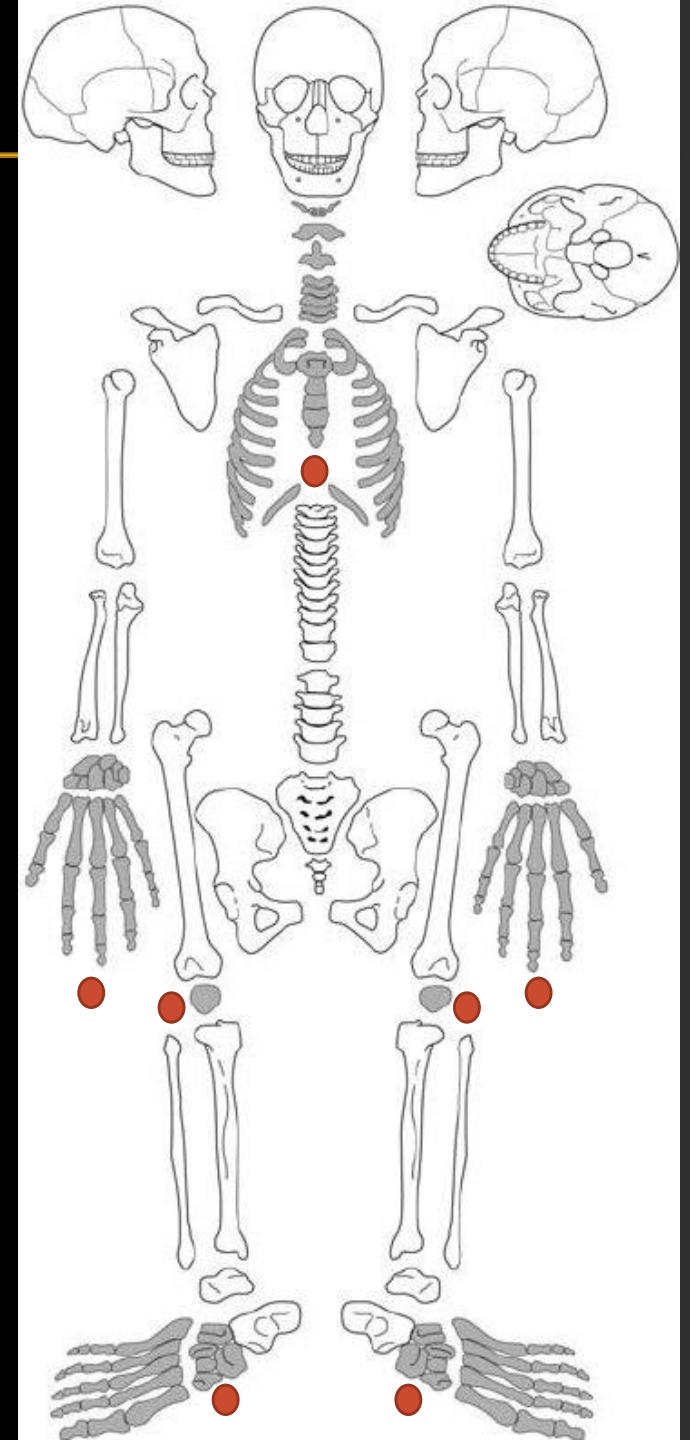


Primary burial F.3891 adult male, Çatalhöyük (Turkey)

# Primary burial

1. observation of the anatomical connections
2. more precisely of the labile type joints
3. some connections give way faster than others
4. *labile joints first to give way* = small & fragile bones (*i.e.* cervical vertebrae, patella, hands, feet)
5. *persistent joints are preserved longer* = solid & voluminous bones

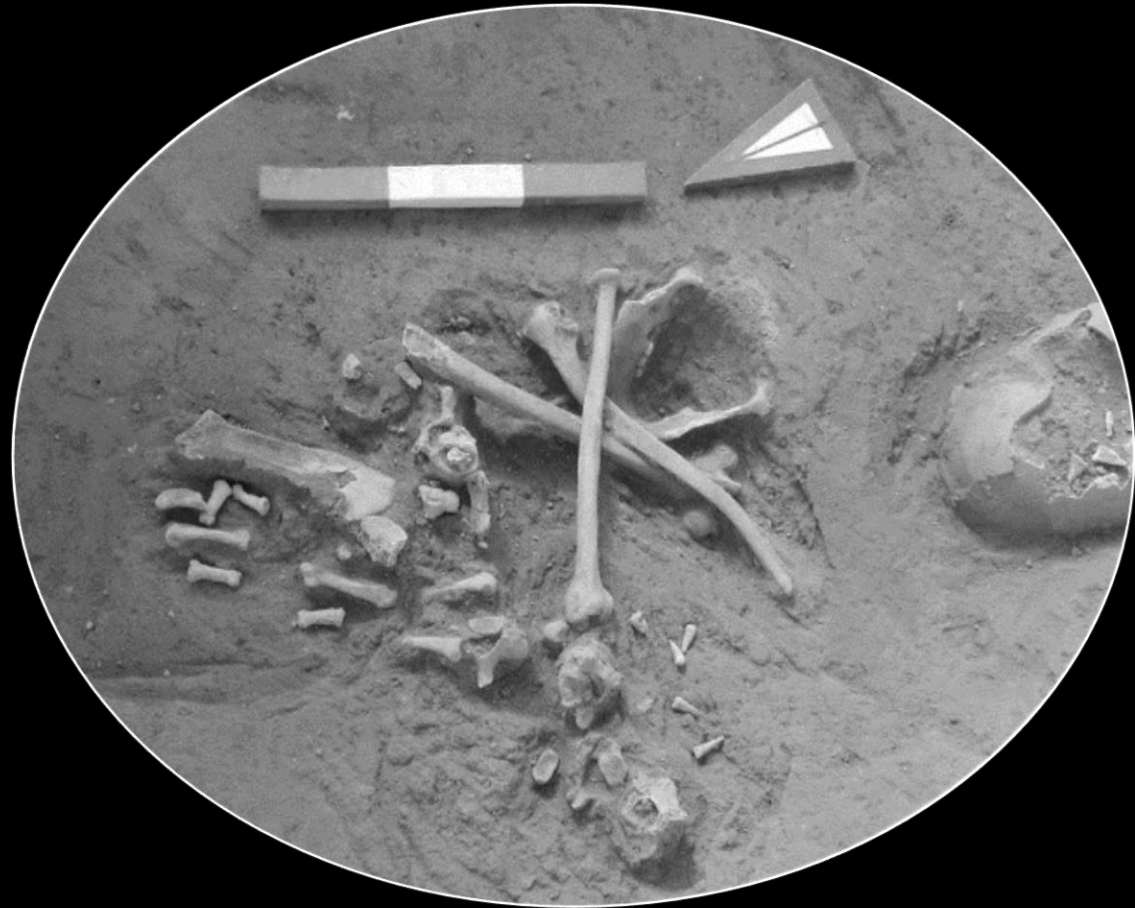
preserved labile connections → primary burial



# Secondary burial



Secondary burial, Laos



Secondary burial A10q1137, Tell Mozan (Syria)

However, the reverse reasoning is not necessarily valid

# ➡ Different categories of funerary deposits

- *Secondary burial* "double funeral" = human remains are manipulated at two different stages
  1. First the corpse is put in a temporary burial where decomposition takes place
  2. Afterwards the bones are transferred to a tomb

The final burial happens away from the place of decomposition → impossible to observe the diagenesis of the corpse in the place of final deposition



Challenging





1. Primary or secondary?

2. Single, multiple or collective?

3. Decomposition in a void or a filled space ?

## ➡ 2. Single, multiple or collective burial?

*Minimum number of individuals, or MNI (White, 1953)*

- *Individual* burial
- *Double* burial
- *Multiple* burial
- *Collective* burial



## 2. Single, multiple or collective burial?

*Individual burial* = containing the remains of a single individual



Single burial, Olmos (Peru)



## ➡ 2. Single, multiple or collective burial?

- *Multiple burial* = comprises dead bodies deposited in the same place simultaneously → evidence for catastrophic events, massacres, plagues, floods, etc., which have caused a mortality crisis.
- The minimum form of multiple burial, containing only 2 individuals deposited at the same time = *double*.



Double burial, Raqefet Cave, (Palestine)



Multiple burial with 80 skeletons, near Athens (Greece)

## ➡ 2. Single, multiple or collective burial?

- *Collective burial* = corpses deposited at different times & the structure allowing reopening for further depositions



St. Pauls Catacombs, Rabat (Malte)



Collective burial, Saint-Rémy-la-Calonne, Meuse (France)

1. Primary or secondary?

2. Single, multiple or collective?

3. Decomposition in a void or a filled space ?

## ➡ 3. Decomposition in a void or a filled space ?

Observations on the taphonomy of a corps →

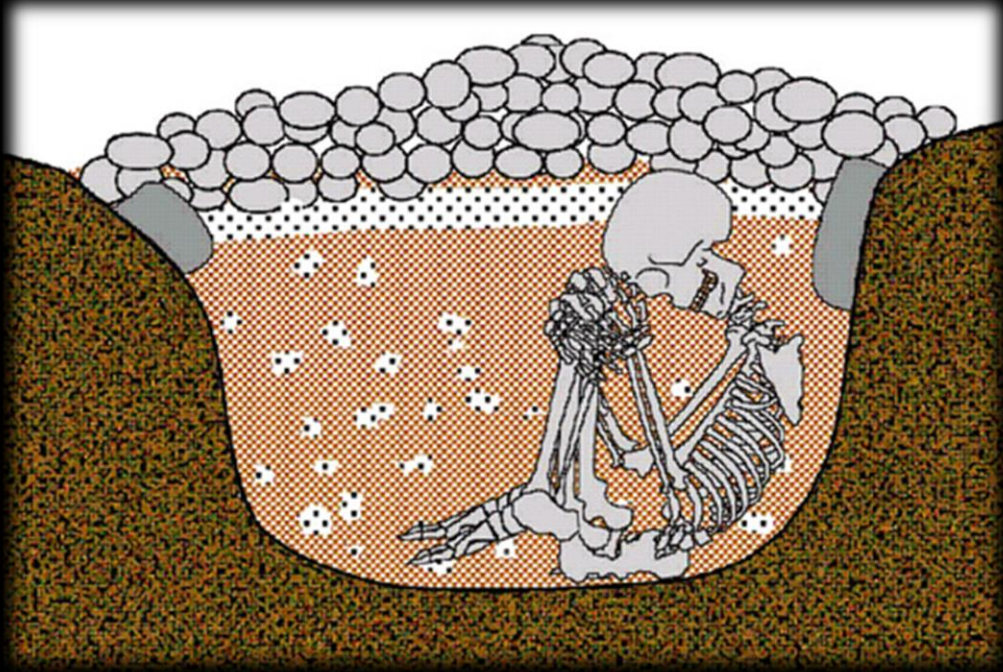
useful information on the micro-environment in which a decay process takes place, and, in directly on burial architecture : the corps may be buried either :

- **in a filled space**
- **or in a void**



A child burial in a filled space, l'église Saint-Saturnin (France)

### 3. Decomposition in a filled space



victim of the Vesuvius eruption of 79 AD, Pompeii (Italy)



## ➡ 3. Decomposition in a filled space

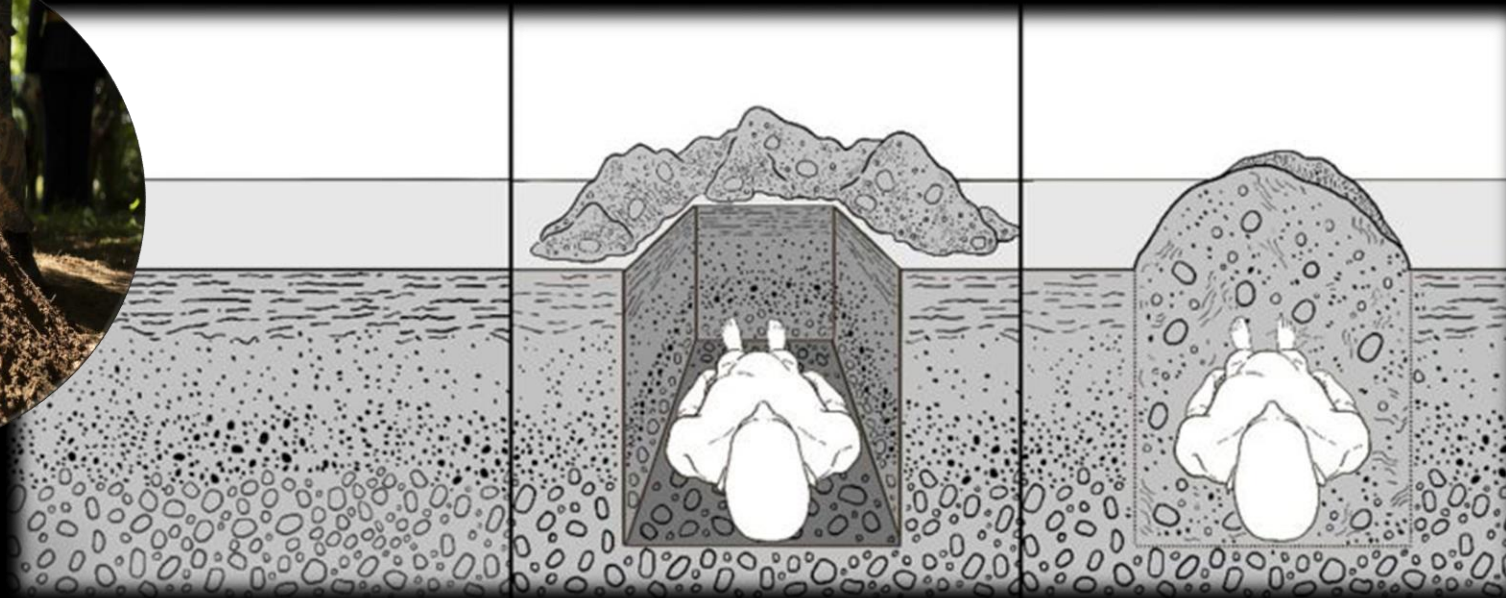
- **Three mechanisms** have been identified in the process of filling:



## 3. Decomposition in a filled space

- **Three mechanisms** have been identified in the process of filling.

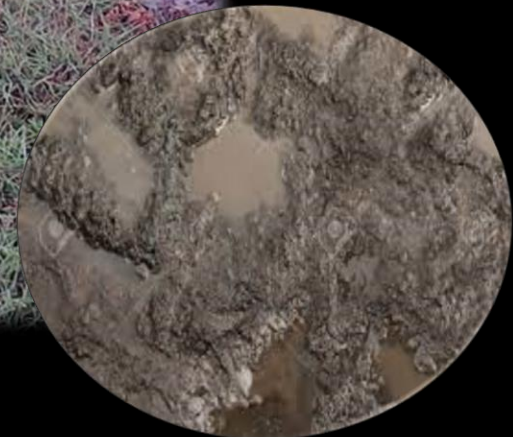
*1. the force of gravity* = the sediment that has built up above the corpse falls into the spaces left empty by the disappearance of the soft tissue.



## 3. Decomposition in a filled space

- Three mechanisms have been identified in the process of filling.

2. the increase in volume of clay sediment when wet = decomposition fluids from the corpse soak the sediment and, if clay, this expands to fill the empty spaces.



## 3. Decomposition in a filled space

- Three mechanisms have been identified in the process of filling.

### 3. the disturbance caused by the actions of small animals

= while digging tunnels they swallow the soil and later expel it. Such animals particularly seek out humid areas where the sediment is rich in organic matter, like those near burials.



# 3. Decomposition in a filled space

The space freed by the decomposition of flesh & organs + gravity → skeletal movements & displacements inside the tomb → to observe the:

1. collapse of the ribs
2. fall of the sternum
3. dislocation of the spine

These movements depend on various factors (i.e. the position of inhumation, the decomposition environment & the funeral architecture).

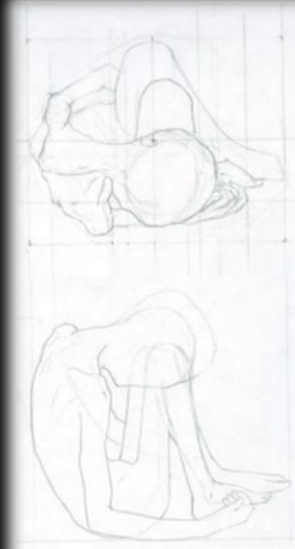


Fig. 26: Sketch position D1, SG

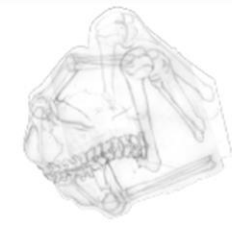


Fig. 27: Sketch skeleton D1, SG



Fig. 28: Initial drawing of placement D1, SG

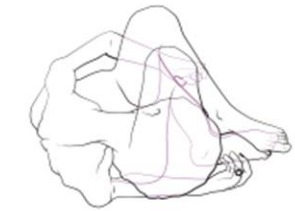


Fig. 29: Stages of line drawing of initial placement D1, SG  
/ Hidden structures

## 3. Decomposition in a filled space

- bones in an unbalanced position do not tip over into the volume outside the corpse/no void to allow their movement outside the body volume



## ➡ 3. Decomposition in a filled space

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Different types of a filled space:

1. sediment is fine and fluid & can seep into the internal volume of the corpse → **progressive filling**  
= soft parts will disappear → creating voids that will be gradually filled by the sediment, preventing any movement = the anatomical connections in potential imbalance, in relation to the inner volume of the corpse, are preserved.
2. sediment is thicker and cannot immediately replace decomposing flesh → **delayed filling** = small displacements within the initial body volume.

## ➡ 3. Decomposition in a void

An observation on the relationships between the internal and external environments of the corpse can provide us with useful information about the cadaver environment

**Archaeothanatology** allows clues to be identified related to the presence of a void at the moment of burial

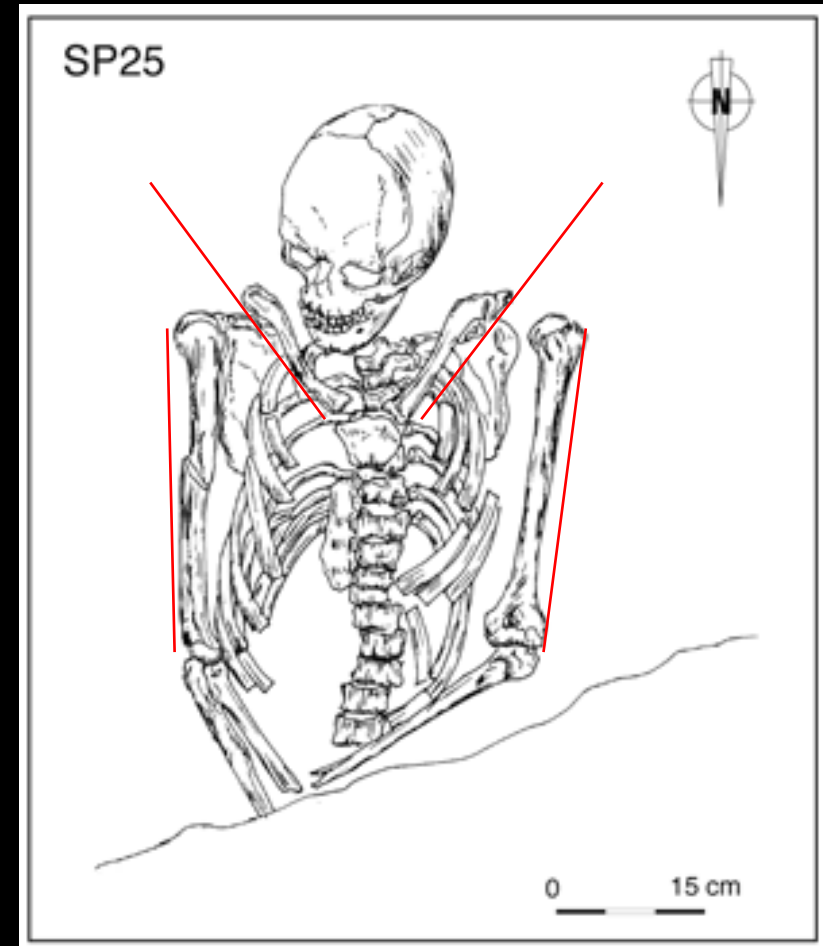
*traces of wood, nails or differences in fill* → what type of structure might have caused this void, coffin, burial chamber, wooden framework, etc.





## 3. Decomposition in a void

- The existence of a container around the cadaver that is **sufficiently durable** for the decomposition of the body to have taken place before the sepulchral space is filled = some bones become mobile and may leave the initial volume of the body, causing greater displacements than those observed in a filled space.
- These movements occur when the bone parts are in a **position of imbalance** in relation to the volume outside the corpse.
- Wall effects may indicate the use of a funerary structure made of perishable material when certain bones remain in balance or are under stress (*e.g.* **verticalization of the clavicles**).



## 3. Decomposition in a void

a void can also be detected in the absence of architectonic elements:

e.g. individuals buried under covers of leather, a thick and rigid material

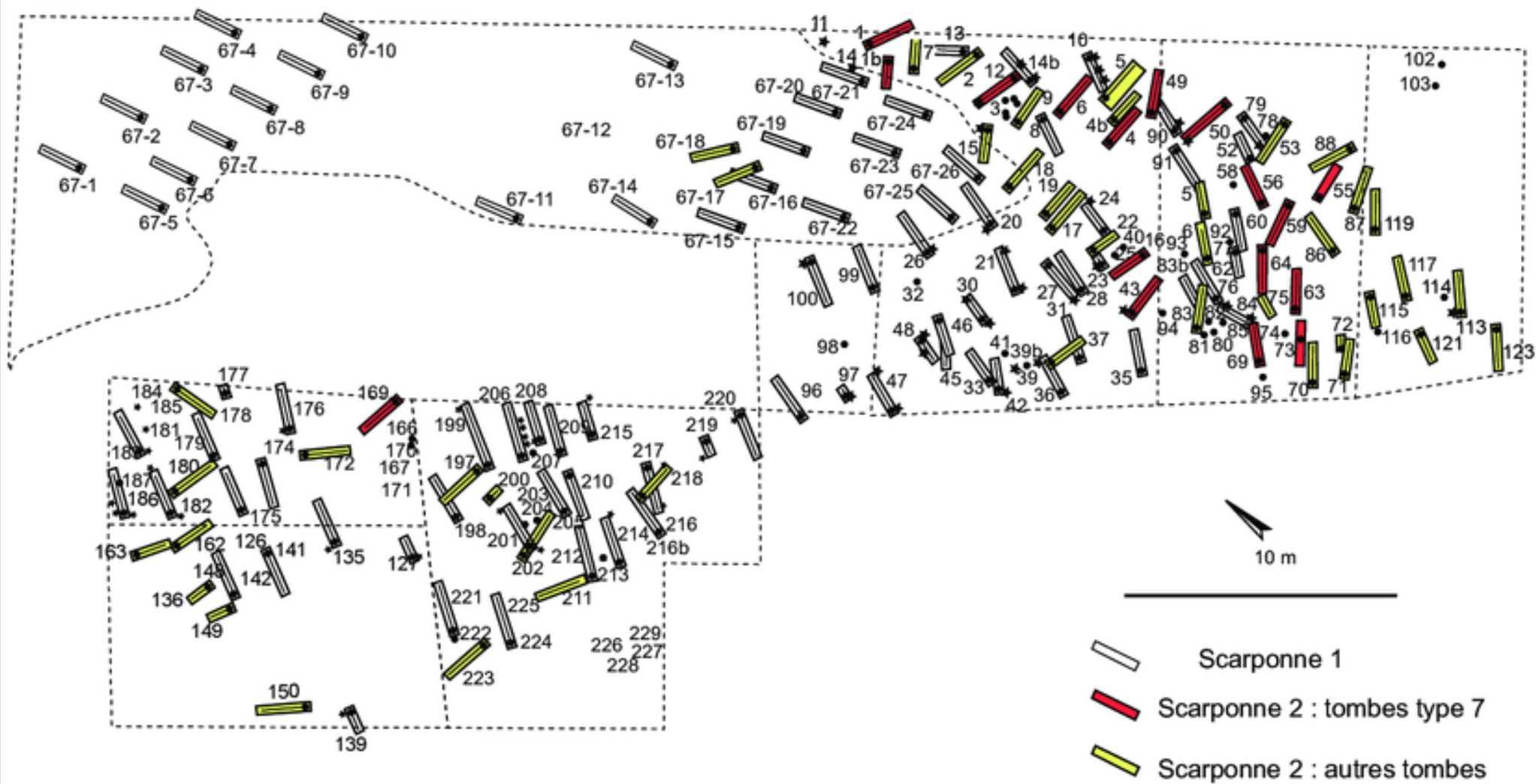
→ that creates a void around the corpse

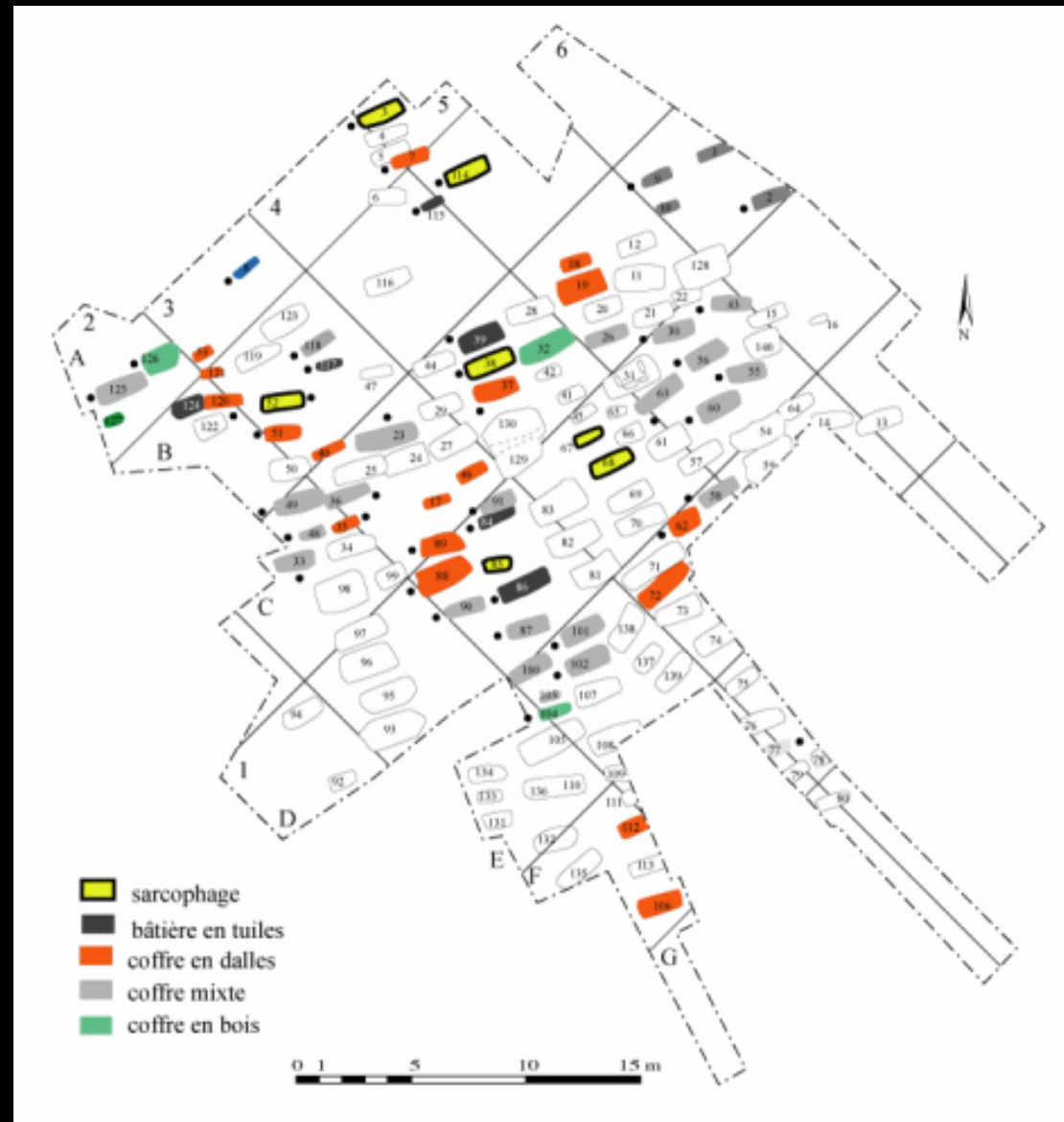
→ seen in the **displacement of bones away from the space originally occupied by the body**, since the cover decayed long after the corpse did.



A child burial in a jar, Toulouse (France)

# Dieulouard-Scarponne







To you! case study & interpretations























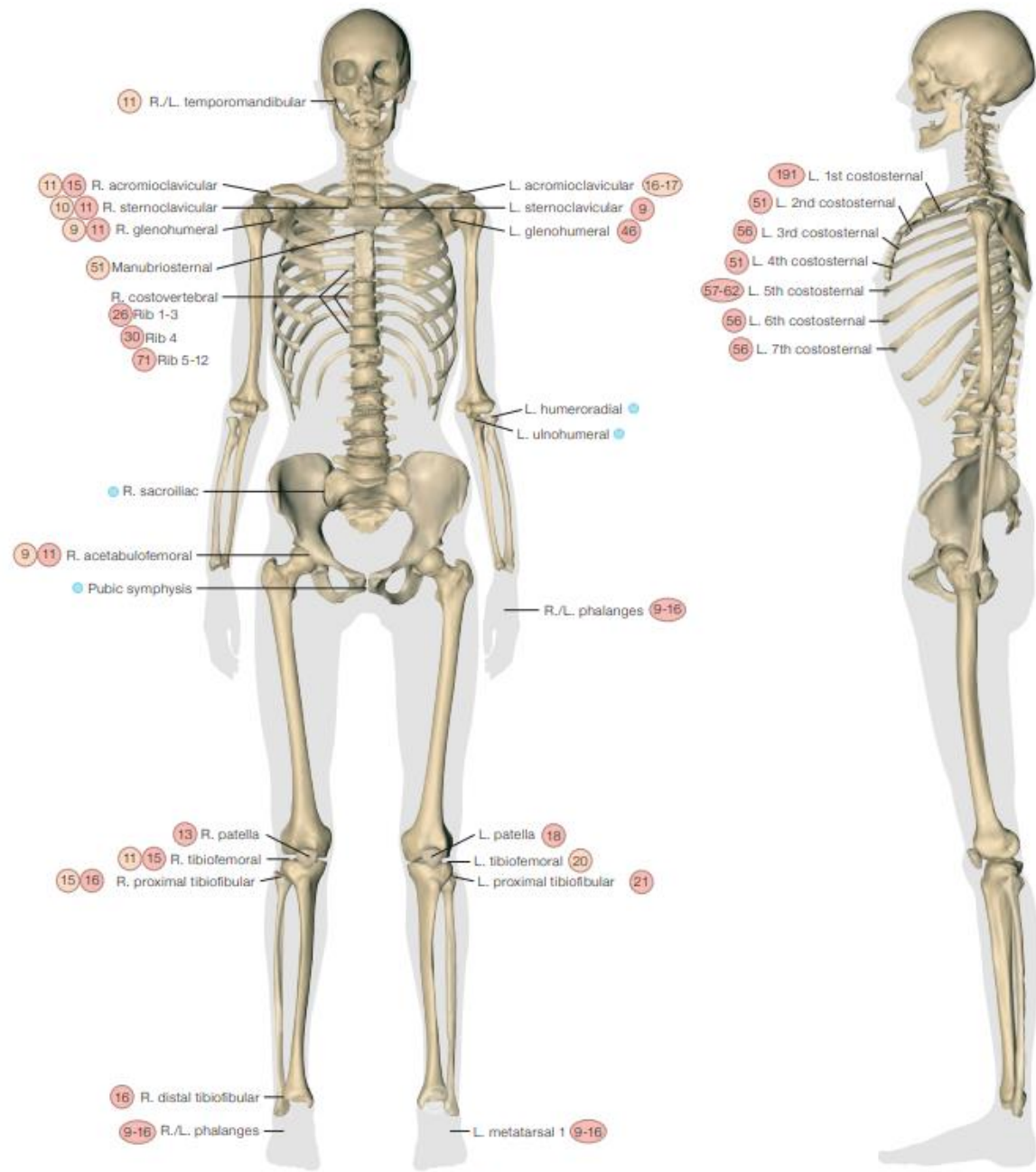


Fig. 21: Ventral and lateral view of joint expansion and joint disarticulation, SG

DAY Joint expansion   
 DAY Joint disarticulation   
 ● Adjustment of data needed



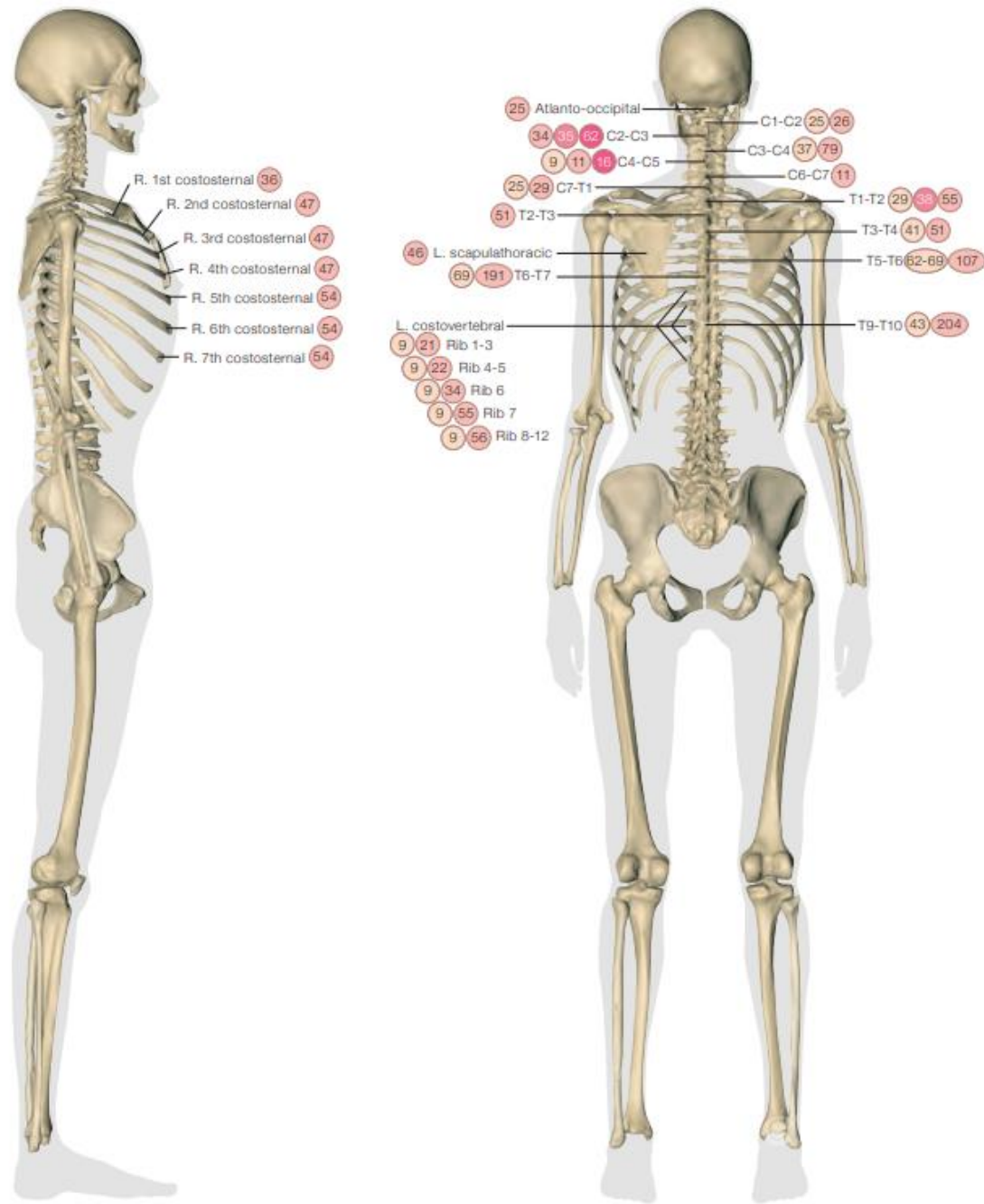


Fig. 22: Lateral and dorsal view of joint expansion, joint disarticulation and joint rearticulation, SG

DAY Joint expansion DAY Joint disarticulation DAY Joint rearticulation DAY 2nd Joint disarticulation

