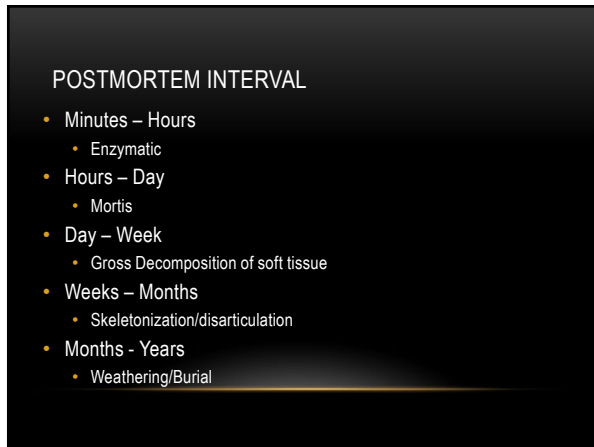
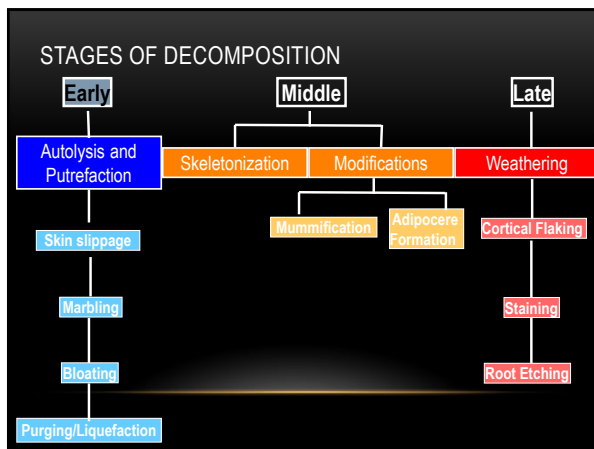




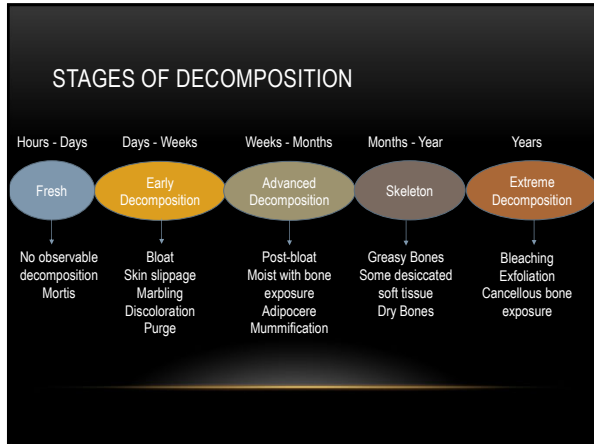
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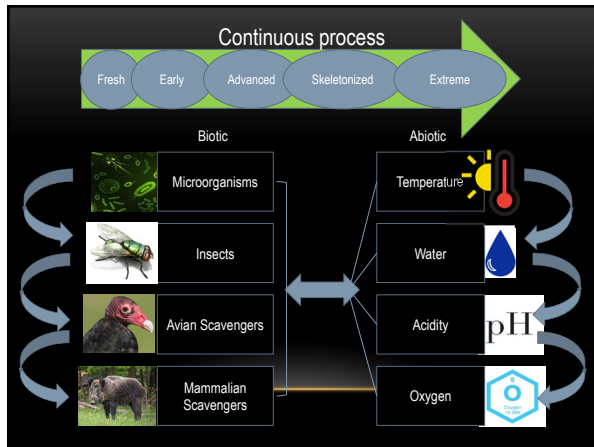
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Early Decomposition

- **Autolysis** - breakdown of tissue by tissue-produced enzymes
 - **Skin slippage**, Discoloration, Marbling
- **Putrefaction** - decomposition by microorganisms
 - Discoloration of Skin
 - Marbling of skin
 - Bloat - swelling from gases
 - Odor
 - Purge
- **Colonization by insects**

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EARLY DECOMPOSITION

A photograph of a decomposing animal carcass, likely a pig, lying on the ground. The skin is peeling away from the body, revealing the underlying tissue. The carcass is surrounded by grass and dirt. In the top right corner, there are two smaller inset images: one showing a hand with a greenish, mottled appearance (gloving) and another showing a hand with a similar appearance (gloving).

Skin Slippage

Gloving

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EARLY DECOMPOSITION


Marbling
Breakdown of red blood cells and their reaction with hydrogen sulfide made by bacteria



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EARLY DECOMPOSITION - BLOAT

Uncontrolled growth in bacteria and fungi
Face tends to swell first; abdomen distends



17

EARLY DECOMPOSITION



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EARLY DECOMPOSITION - PURGE

Excessive gas pressure in abdominal cavity forces fluid out of lungs and airways through orifices



19

EARLY DECOMPOSITION - PURGE

Tissues and organs break down becoming soft and unrecognizable
Known as wet decomposition

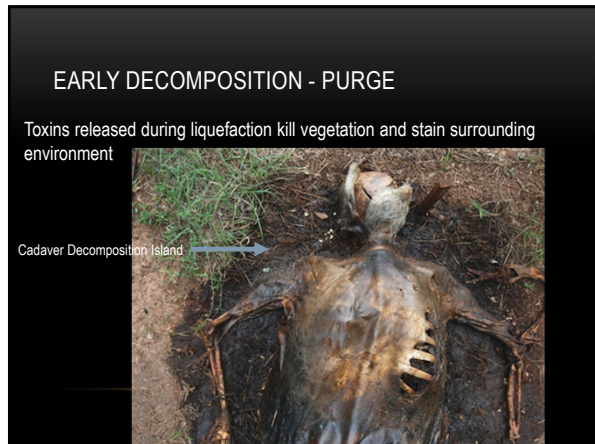


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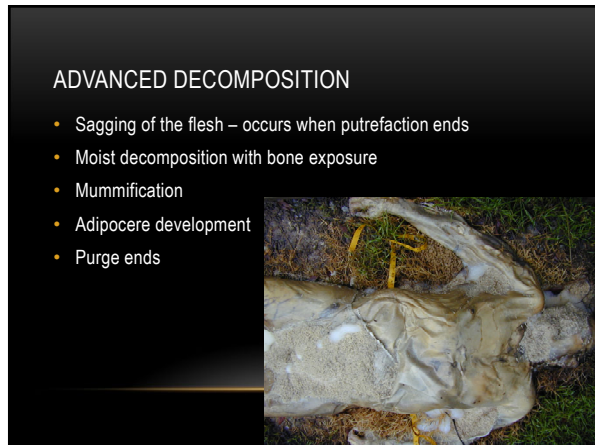
EARLY DECOMPOSITION - PURGE



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ADVANCED DECOMPOSITION



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ADVANCED DECOMPOSITION - MUMMIFICATION

Depends on the success of the early stages of decomposition

Dehydration on outer surface of remains

Extreme heat, low humidity, high solar radiation and air currents can lead to mummification



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ADVANCED DECOMPOSITION


- **Adipocere Formation**
 - Breakdown of fatty tissue into a greasy substance
 - Warm, moist, anaerobic



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SKELETONIZATION

- Bone exposure
- Bone has greasy appearance
- Bones may have desiccated tissues covering less than half of the skeleton
- Dry bone



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SKELETONIZATION



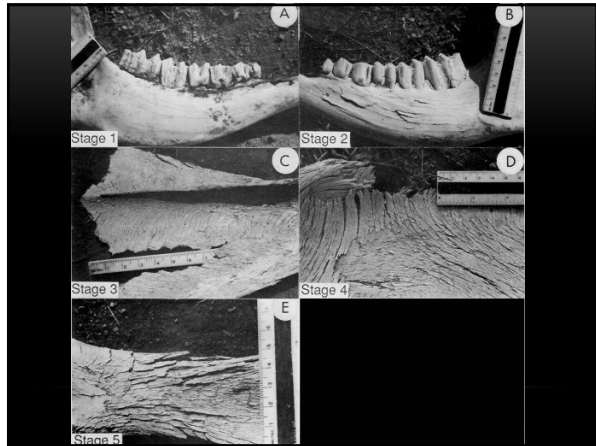
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EXTREME DECOMPOSITION

- Occurs after skeletonization
- Visible changes in in the outer cortex of bone



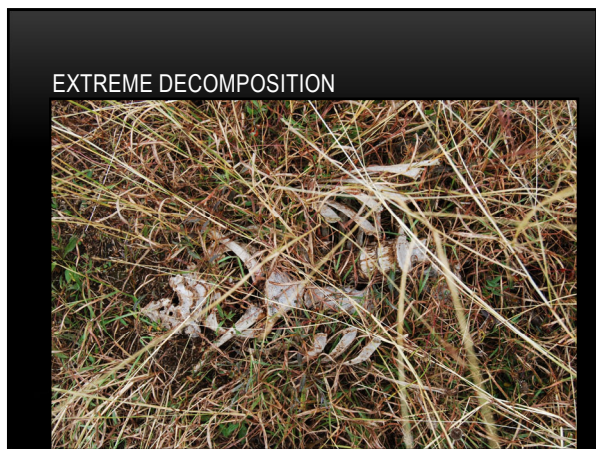
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FACTORS EFFECTING DECOMPOSITION

- **Environmental**
 - Temperature, humidity, weather exposure, soil pH, fire
- **Biological**
 - Insect colonization, scavenger access, plant activity, body size, trauma
- **Cultural**
 - Clothing, burial, embalming, closed structures, fire



34

DEPTH OF BURIAL

- **Surface**
 - Insect activity
 - Animal activity
 - Temperature fluctuations
 - Weathering
- **Shallow**
 - Some insect activity
 - Some animal activity
 - Some weathering
- **Deep**
 - Cool temperatures
 - Little insect or animal activity
 - Little weathering
 - Soil ph

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ENVIRONMENTAL FACTORS..

- ☠ Temperature
- ☠ Water
- ☠ Oxygen
- ☠ pH
- ☠ Insect access
- ☠ Carnivore access



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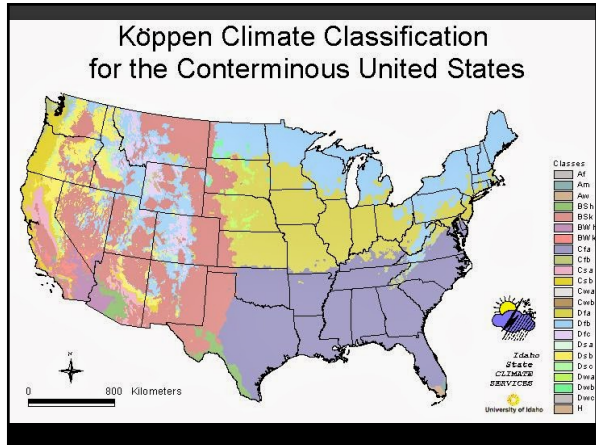
TEMPERATURE

- Slows autolysis and putrefaction
- Affects insect and animal activity
- Male and female died approximately the same time
- Male found upstairs in bedroom
- Female found in cellar



37

Köppen Climate Classification for the Conterminous United States

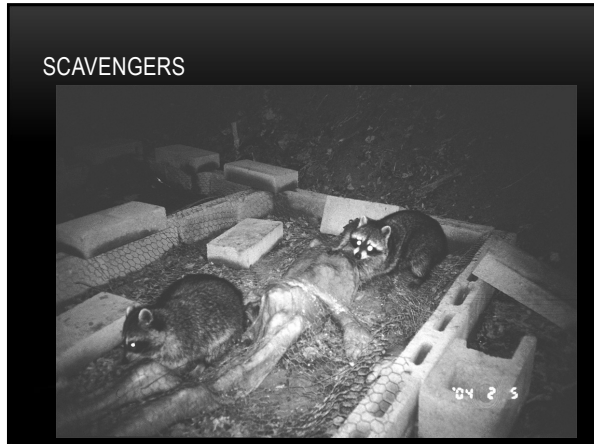


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Water



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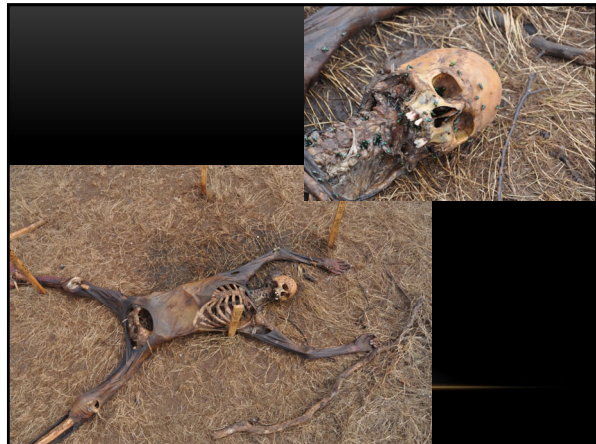
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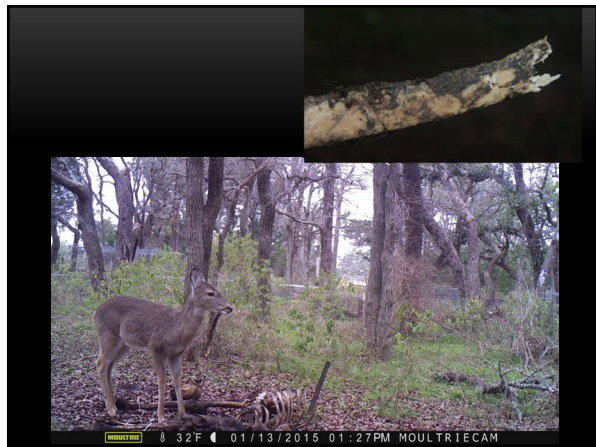
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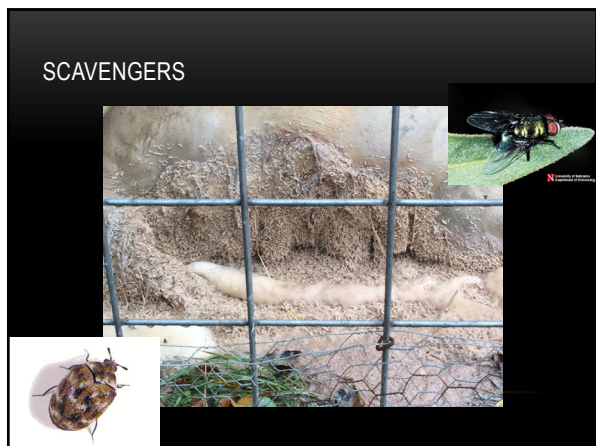
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INSECT ACTIVITY

- Life cycle stages
- Succession
- Correlation between insect activity and temp/humidity



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ESTIMATING THE POSTMORTEM INTERVAL

- Fresh – cooling, rigor, lividity, others
- Early – microbial diversity, insect succession and development, gross morphology
- Advanced – Gross morphology, microbial, botany, soil analysis
- Skeletal – weathering, radiocarbon, soil analysis



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Mary S. Megyesi,¹ M.Sc.; Stephen P. Nawrocki,² Ph.D., D.A.B.F.A.; and Neal H. Haskell,³ Ph.D.

Using Accumulated Degree-Days to Estimate the Postmortem Interval from Decomposed Human Remains*

TABLE 2—Categories and stages of decomposition for the head and neck.	TABLE 3—Categories and stages of decomposition for the trunk.
<p>A. Fresh (1pt) 1. Fresh, no discoloration</p> <p>B. Early decomposition (2pts) 1. Pink-white appearance with skin slippage and some hair loss. (3pts) 2. Gray to green discoloration; some flesh still relatively fresh. (4pts) 3. Discoloration and/or brownish shades particularly at edges, drying of nose, ears and lips. (5pts) 4. Purging of decomposition fluids out of eyes, ears, nose, mouth, some bloating of neck and face may be present. (6pts) 5. Brown to black discoloration of flesh.</p> <p>C. Advanced decomposition (7pts) 1. Caving in of the flesh and tissues of eyes and throat. (8pts) 2. Moist decomposition with bone exposure less than one half that of the area being scored. (9pts) 3. Mummification with bone exposure less than one half that of the area being scored.</p> <p>D. Skeletonization (10pts) 1. Bone exposure of more than half of the area being scored with greasy substances and decomposed tissue. (11pts) 2. Bone exposure of more than half the area being scored with desiccated or mummified tissue. (12pts) 3. Bones largely dry, but retaining some grease. (13pts) 4. Dry bone.</p>	<p>A. Fresh (1pt) 1. Fresh, no discoloration.</p> <p>B. Early decomposition (2pts) 1. Pink-white appearance with skin slippage and marbling present. (3pts) 2. Gray to green discoloration; some flesh relatively fresh. (4pts) 3. Bloating with green discoloration and purging of decomposition fluids. (5pts) 4. Postbloating following release of the abdominal gases, with discoloration changing from green to black.</p> <p>C. Advanced decomposition (6pts) 1. Decomposition of tissue producing sagging of flesh caving out of the abdominal cavity. (7pts) 2. Moist decomposition with bone exposure less than one half that of the area being scored. (8pts) 3. Mummification with bone exposure of less than one half that of the area being scored.</p> <p>D. Skeletonization (9pts) 1. Bones with decomposed tissue, sometimes with body fluids and grease still present. (10pts) 2. Bones with desiccated or mummified tissue covering less than one half of the area being scored. (11pts) 3. Bones largely dry, but retaining some grease. (12pts) 4. Dry bone.</p>

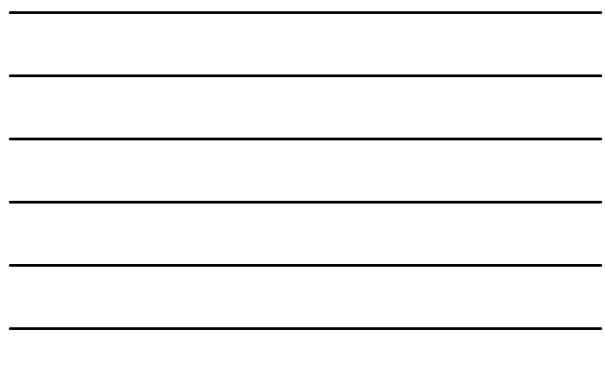


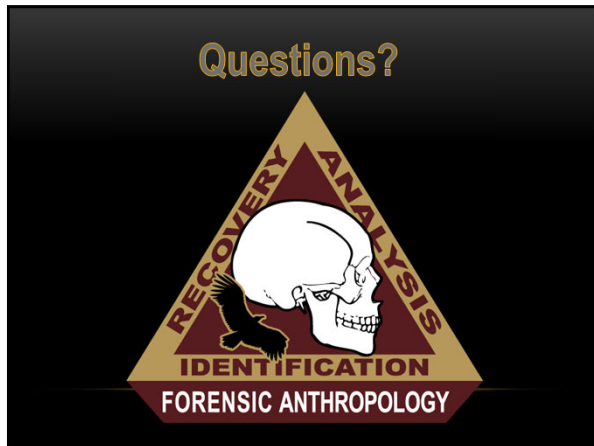
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TABLE 4—Categories and stages of decomposition for the limbs.	Equations
<p>A. Fresh (1pt) 1. Fresh, no discoloration</p> <p>B. Early decomposition (2pts) 1. Pink-white appearance with skin slippage of hands and/or feet. (3pts) 2. Gray to green discoloration; marbling; some flesh still relatively fresh. (4pts) 3. Discoloration and/or brownish shades particularly at edges, drying of fingers, toes, and other projecting extremities. (5pts) 4. Brown to black discoloration, skin having a leathery appearance.</p> <p>C. Advanced decomposition (6pts) 1. Moist decomposition with bone exposure less than one half that of the area being scored. (7pts) 2. Mummification with bone exposure of less than one half that of the area being scored.</p> <p>D. Skeletonization (8pts) 1. Bone exposure over one half the area being scored, some decomposed tissue and body fluids remaining. (9pts) 2. Bones largely dry, but retaining some grease. (10pts) 3. Dry bone.</p>	$ADD = 10^{(0.002 \cdot TBS + TBS + 1.81)} \pm 388.16$ $ADD = 10^{(0.002 \cdot 30 \cdot 30 + 1.81)} \pm 388.16$ $ADD = 10^{(1.8 + 1.81)} \pm 388.16$ $ADD = 10^{(3.61)} \pm 388.16$ $ADD = 4073.81 \pm 388.16$





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