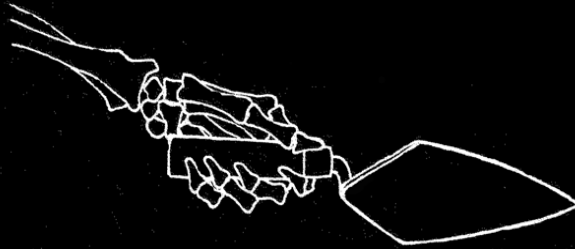


AN INTRODUCTION TO HUMAN DECOMPOSITION AND ODOR FOR THE CANINE HANDLER

Paul S. Martin

Western Carolina University



Cadaver Dog Training Program

ODOR MORTIS:

**THE RESULT OF COMPLEX
CHEMICAL CHANGES THAT
OCCUR DURING THE
DECOMPOSITION
PROCESS**

FOUR STAGES OF DECOMPOSITION

- **Autolysis**
 - **Putrefaction**
 - **Active Decay**
 - **Destruction of Bone**
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THE SCIENCE OF ODOR



THE EARLY RESEARCH

- **Initially placed a strong emphasis on cadaverine and putrescine as being primary components of the spectrum.**
- **Research has shown that cadaverine and putrescine if present in the scent spectrum dissapates quickly. This research has also put more emphasis into volatile compounds.**

UNDERSTANDING ODOR

- **What is Odor?**
 - **Odor through the Decomposition Process**
 - **Environmental Movement**
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ODOR IS:

- **Complex chemical compound that can be broken down into isolated compounds**
 - **Scent spectrum analysis of human decomposition has revealed over 478 separate compounds**
 - **Emphasis has been placed upon volatile compounds that produce characteristic odors.**
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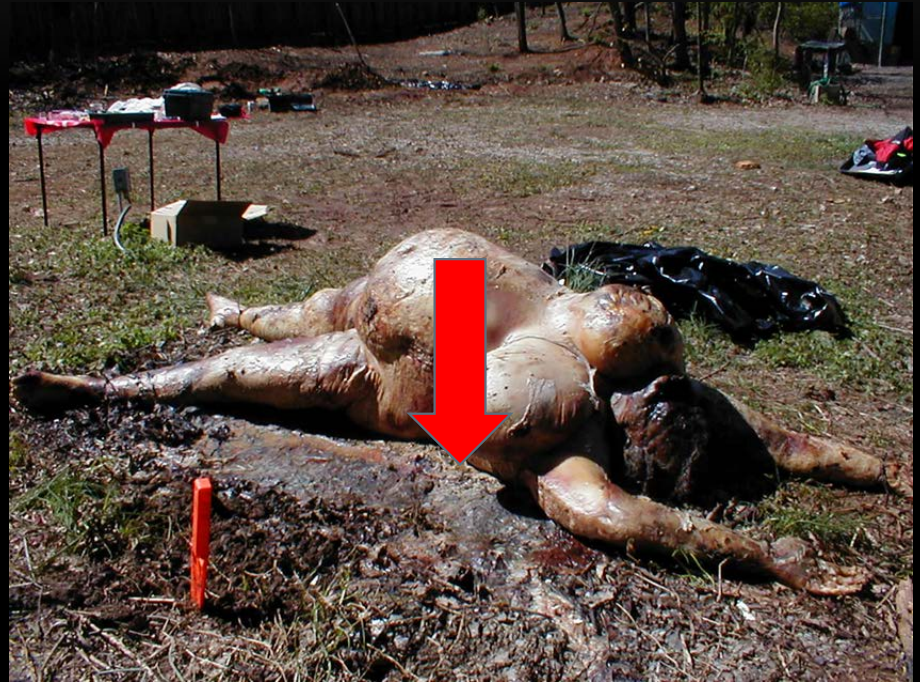
INITIAL ODOR PRODUCTION

- Decomposition odor production begins with the onset of autolysis



PRIMARY ODOR PRODUCTION

- Odor levels increase as the decomposition process progresses with a sudden spike with the purge.
- Odor Levels remain elevated throughout active decay.



SECONDARY ODOR PRODUCTION

- Odor levels then decrease through active decay until skeletonization occurs.
- Odor levels become more stable as the bone is destroyed leaving residue in surrounding soils.

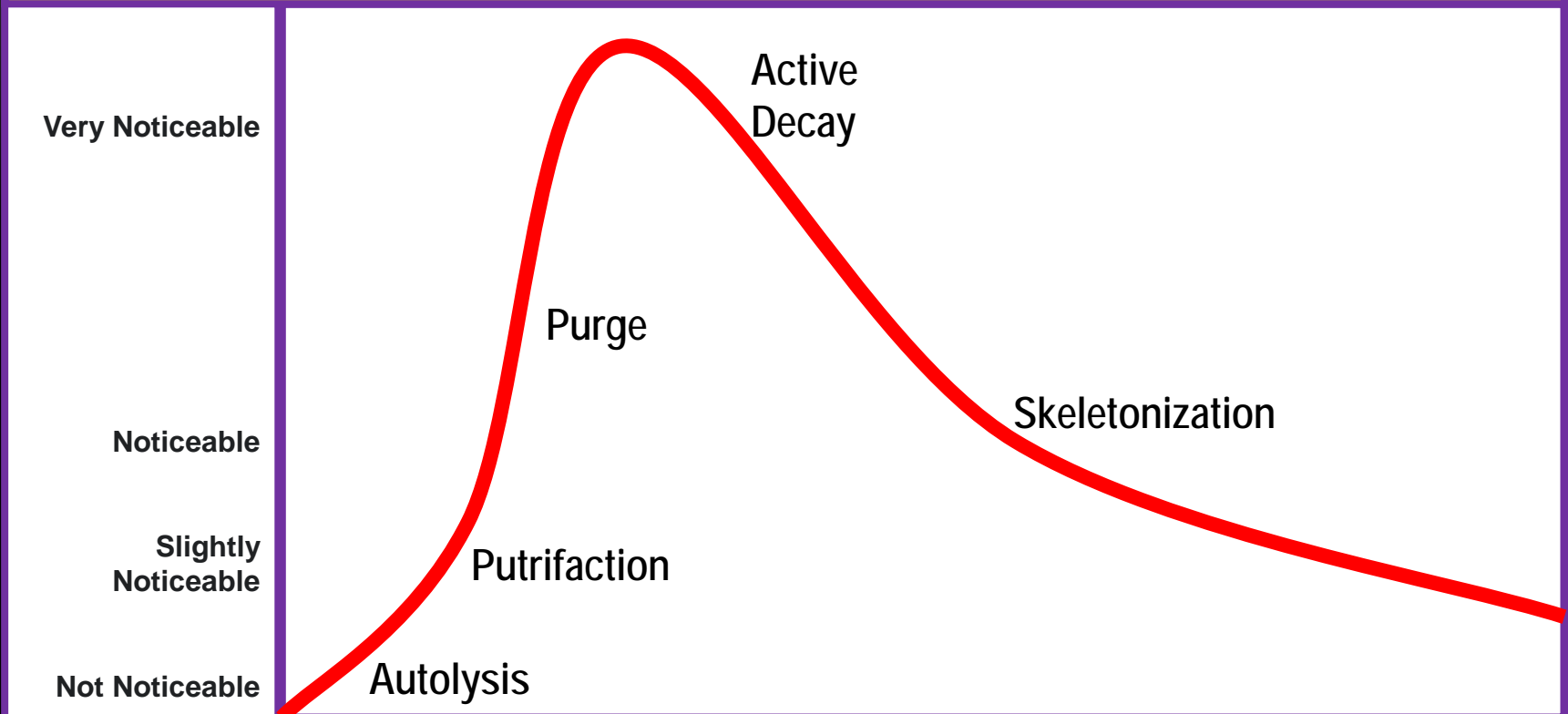


LOW ODOR LEVELS

- Even though bone might be mostly and even completely destroyed odor will persist, if even at very decreased levels.



Levels of Odor through the Decomposition Process



As the body passes through the decomposition process starting with time of death there is very little to no noticeable odor. Odor levels will increase with putrefaction, and then spike when the purge occurs. When the remains pass through active decay odor levels begin to lower and then level off once the body has become skeletonized.

Odor Availability

ENVIRONMENTAL CONDITIONS

- **Barometric Pressure**
 - **Temperature**
 - **Soil Texture**
 - **Soil Moisture**
 - **Humidity**
 - **Rainfall**
 - **Wind Speed**
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BAROMETRIC PRESSURE

- **High pressure tends to push compounds deeper in the soil.**
 - **Low pressure tends to help draw compounds to the surface.**
 - **Certain hydrophobic compounds could shift within the soil regardless of the barometric pressure.**
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TEMPERATURE

- **Altitude and Latitude**
 - **Deposition site**
 - **Burial, Surface, Exposed or Shaded**
 - **Presence of water**
 - **Air movement**
 - **Environment**
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SOIL

- **Texture**
 - **Ground cover**
 - **Moisture**
 - **Terrain**
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WATER

- Humidity
- Rainfall

Odor Movement

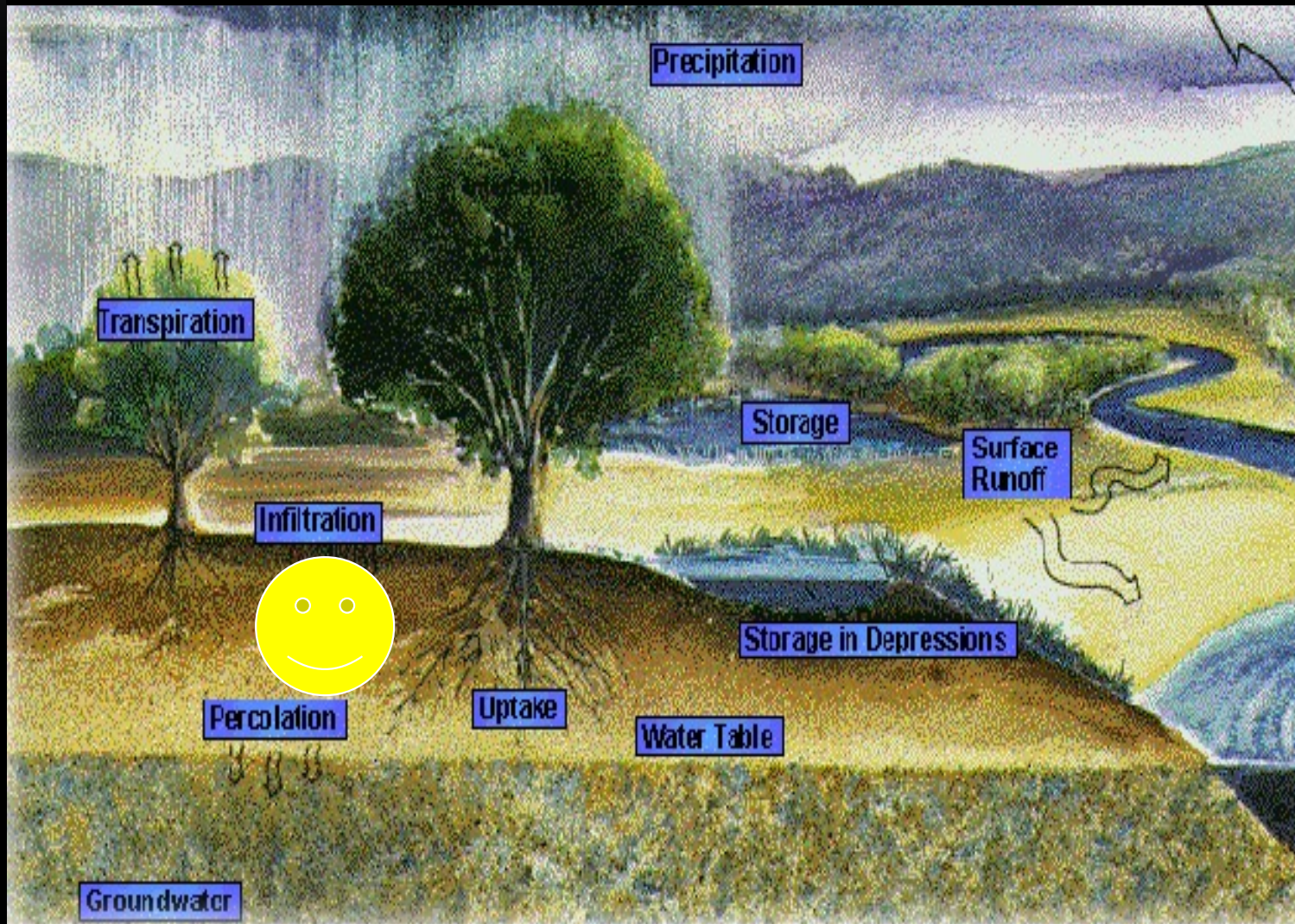
THE BASICS

- Odor moves through the process of *diffusion* from a high concentration to a lower concentration.
- During *trans-evaporation* odor compounds are pulled through the soil during the evaporation process.
 - Scent will be stagnant when the soil is saturated creating a “lense” effect.
- *Bioturbation* is the creation of channels in the soil which creates vents that will assist in the diffusion process allowing odor to escape.

THE BASICS CONTINUED

- Moves as water would through an area, moving, and concentrating in “pools” in low lying areas.
- Moves with the flow of water.
- Blown with the wind.
- Concentrations can collect in thick vegetation.
- Will rise as the temperature rises, and as it cools can “pool” elsewhere.
- Voids can be created by the sun “burning” scent off, but “pools” will still linger due to the shadowing effect.

Where could odor be?



CONCLUSIONS

CONCLUSIONS

- **The environment in which the remains are concealed will dictate the rate of decomposition.**
 - **Decomposition stage and current environmental conditions will affect odor availability.**
 - **These factors should dictate the search strategies that are employed in the search process.**
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SPECIAL APPRECIATION

- Arpad Vass, Ph.D.