

## BOX 4.1 DECAY OF HUMAN REMAINS

It is only in rare circumstances that the soft tissue of humans and other animals is preserved for long. This is because the process of decay is not the passive process that many people envision. Rather, it is an active process involving many microorganisms and insects eating the body.

As described by Hyde et al. (2013, para. 1): “Decomposition is a mosaic system with an intimate association between biotic factors (i.e. the individuality of the cadaver, intrinsic and extrinsic bacteria and other microbes, and insects) and abiotic factors (i.e. weather, climate, and humidity).” The process tends to begin with the breakdown of cells, which feeds bacteria in the body. Eventually other organisms, including maggots, flies, and beetles, may feast on the body.

The process is described by Mary Roach (2004) in the book *Stiff: The Curious Lives of Cadavers*, with a focus on the work of bacteria:

The hallmark of fresh-stage decay is a process called autolysis, or self-digestion. Human cells use enzymes to cleave molecules.... While a person is alive, the cells keep these enzymes in check, preventing them from breaking down the cells' own walls. After death, the enzymes operate unchecked and begin eating through the cell structure, allowing the liquid inside to leak out.... The liquid that is leaking ... [makes] contact with the body's bacteria colonies.... These bacteria were there in the living

body as well.... They've already been enjoying the benefits of a decommissioned human immune system, and now, suddenly, they're awash with this edible goo.... As will happen in times of plenty, the population swells.... Soon bacteria are everywhere. The scene is set for stage two: bloat.

The life of bacterium is built around food.... Like us, they break their food down into more elemental components. The enzymes in our stomachs break meat down into proteins. The bacteria in our gut break those proteins down into amino acids; they take up where we leave off. When we die, they stop feeding on what we've eaten and begin feeding on us.... Bloat is typically short-lived, perhaps a week and it's over. The final stage, putrefaction and decay, lasts longest.

Putrefaction refers to the breaking down and gradual liquefaction of tissue by bacteria.... Dead people, unembalmed ones anyway, basically dissolve.... The digestive organs and lungs disintegrate first, for they are home to the greatest numbers of bacteria; the larger your work crew, the faster the building comes down. The brain is another early-departure organ.... “The brain liquefies very quickly. It just pours out the ears and bubbles out the mouth.”