

CHAPTER 17 Coastal Marshes and Monstrous Microbes

The Lernaean Hydra

The copious springs and wells of ancient Lerna were positively portrayed by ancient **mythographers** as places of water supply, ritualistic worship, and healing. Today we know that the springs of Lerna get their waters from sinkholes in Arcadia, which is a highly **karstified** region. As Chapter 22 explains, the water moves eastward and southeastward out of Arcadia and into Argolis.

Some surface waters of Lerna were described as places of disease, destruction, a water-monster, and disappearance into the Underworld. In ancient Greek myth, the Lernaean Hydra was the enormous female offspring of Typhon and Echidna (Chapters 15 and 30). Hydra lived in the coastal lagoon–marsh complex known as Lake Lerna. As noted in Chapter 22, ancient Lake Lerna ultimately was drained to facilitate farming.

The environs of Lake Lerna were believed to contain one of the entrances to the Underworld. This gate possibly was the deep, suctioning pool—almost certainly a water-holding sinkhole—known as the Alcyonian Lake. After Heracles slew Hydra, she became keeper of the Lernean gate to Hades. Hydra’s after-death form joined Cerberus (the hound of Hades), Scylla’s monstrous horde, and others appointed as guardians of various gates after their deaths. As Chapter 9 explains, karstic gates to Hades were scattered throughout the Greek world.

Eventually Heracles died after being inoculated with venomous blood taken from Hydra’s corpse. In my reading, the story of Heracles’ death

dramatizes the ravages of a necrotizing bacterial infection of the skin and underlying soft tissue.

The original mythtellers knew nothing about microbes. But they certainly knew the effects of infection and tissue necrosis. Even a minor skin wound can cause a rapid and excruciating death owing to the activities of certain bacteria. In a prescientific setting, what better way to describe an unseen agent of painful death than as an unstoppable, many-headed monster?

HORRIBLE HYDRA AND HER COASTAL HOME

Hydra's territory ranged from the hillside springs of Amymone (Chapter 22) down to the marshy coastal region of the Argive plain. Hydra nested on a ridge beside the springs.

Apollodorus says that the she-beast was nurtured in the marshes of Lerna, from where she would go out onto the flat plain to raid sheep and ruin the land. Apollodorus's account brings to my mind the occurrence of coastal flooding caused by either freshwater runoff, saltwater incursion from stormy seas, or a combination of the two. Rising waters could drown unwary sheep, and significant salt deposits could temporarily ruin nearby croplands, just as Apollodorus describes.

Another possibility (in my opinion) is the sporadic issuance of **hydrothermal** groundwaters that delivered chemicals and minerals harmful to crops and flocks. Or perhaps water with occluded bitumen was present in places.

I consider these possibilities because ancient geographers associate Hydra's poison with smelly natural waters. As I mention in Chapter 12, the odorous River Anigrus of Elis was alleged to contain residues of Hydra's venom. Likewise, certain odorous, "clotted" springwaters in Ozolian Locris issued from the base of the hill Taphiassus, which contained the tomb of Nessus. When I think of what would cause water to smell and "clot," I think of oily, sticky, or tarry petroleum substances.

Unknown is whether portions of Lerna's coastal wetlands were anoxic: if so, gases—perhaps odorous ones—could have been emitted from stagnant substrates. Latin writers refer to the "snaky brook" and "torpid stream of Lerna," emphasizing the sluggishness of flow.

Latin poet Statius alludes to the warmth of the deep Lernaean waters, perhaps indicating the presence of hot springs that discharged into the coastal marsh. Latin poet Virgil mentions the terrible hissing of Hydra.

Unknown is whether gases were emitted at Lake Lerna from **geothermal** features such as **fumaroles**.

Latin mythographer Hyginus says that Hydra killed men with her breath alone. Anyone that breathed in where she had breathed out would die in greatest torment. I suppose that the issuance of a sufficient concentration of toxic gases from a fumarole (i.e., Hydra's exhalation) conceivably could kill a human caught in its thick cloud.

Alternately, I suppose that the lagoon vicinity sometimes could have been malarial and subject to outbreaks of infectious disease. As we know from modern influenza pandemics, merely inhaling contaminated air ultimately can cause death. But I tend to favor an interpretation which links the marshy, potentially geothermal environment with biological effects. As I suggest in Chapter 30, Hydra's father Typhon could have been associated with volcanism and geothermalism, so it would make sense to me that his monstrous daughter might have a connection to earthborn heat.

Self-Regenerating Heads

Greek and Latin mythographers insist that Hydra was a huge serpentine monster with multiple heads numbering anywhere from nine to one hundred. The geographer Pausanias opines that Hydra was a particularly large water snake with only one head, but whose physical description was embellished by poets such as Peisander of Kamirus.

The most menacing characteristic of Hydra was her array of biting heads on snakelike necks. The Hydra could regrow two heads in place of each head that was decapitated. The Greek epic poet Nonnus describes a "plentiful crop of snakeheads" that spiked up as self-growing firstfruits. He also references a "bush of heads which ever grew again on so many necks."

In Ovid's *Metamorphoses*, the monstrous Lernaean Hydra is said to thrive on wounds and gain from loss. If one of its many heads is decapitated, from its neck two more will spring, and stronger than before. In Ovid's words, the Hydra "branched with serpents sprung from death, and multiplied on doom (fate of death)."

Apollodorus notes that amidst the many mortal heads of Hydra, the middle head was immortal. Ptolemy Hephaestion reports Aristonikus of Tarenton as saying that the middle head was gold, which presumably represents immortality.

One Scary Situation

As I see it, the monstrous descriptions of Hydra were mythtelling devices to emphasize her destructive nature against which mortal men were powerless. What could be more fearful than an enemy whose breath alone could kill, and who regenerated twofold when struck down? Only a demigod like Heracles, with inspiration from Athena, could devise an ingenious scheme against a foe considered to be invincible.

As the preceding and following sections explain, the mythographers give us repeated clues regarding the nature of Hydra's destructiveness. Certain commentators since the mid-1800s have interpreted the struggle between Heracles and Hydra as the struggle of the Lernaean people as they tried to change the inhospitable environment by draining the lake. Although hydrology indeed was one of many environmental concerns in ancient Greece, the mythographers say nothing about changing water conditions or attempts at drainage. I think that such shoe-horned interpretations are more far-fetched than the myth itself.

As the following sections indicate, the mythwriters spend much time describing the effects of Hydra's poison on Heracles' body. Hence, I offer an interpretation centered on the human body.

HERACLES KILLS HYDRA

Hesiod tells us that Zeus's wife Hera begrudged the Greek hero Heracles, a son of Zeus by Alcmena, who was the wife of Amphitryon, a distinguished Greek warrior and heir to the throne of Tiryns. In Hera's jealous, wrathful mind, the grisly Hydra was a good bet for destroying Heracles as he carried out his second labor. But by design of the goddess Athena, and with help from Iolaus, Heracles was victorious.

Later writers such as Apollodorus and Hyginus tell us that Heracles, accompanied by his nephew Iolaus, ventured into the Hydra's territory and confronted the beast. To the delight of Hera, a giant crab in the Lernaean marsh tried to help Hydra by biting Heracles on the foot. Heracles easily dispatched the crab.

In Apollodorus's account of Heracles' battle, Hydra wrapped herself around one of his feet. He tried beating her off with his club, but as soon as one head was pounded off, two others grew in its place.

Heracles weakened Hydra by lopping off each of the mortal heads while Iolaus immediately cauterized each neck-stump with a glowing firebrand.

Iolaus's application of cauterization stopped the bloodflow to the head-bud that apparently allowed the head's regeneration.

Then Heracles delivered the fatal blow by decapitating the one immortal head. He buried and covered it with a heavy boulder at the side of the road that runs from Lerna to Elaeus.

In an action that ironically would later be the cause of his own death, Heracles cut up the remainder of Hydra's body and dipped his arrows in her bloody gall. Any living thing pierced by an arrow thus poisoned would be incurably injected with the Hydra's venom. The victim would die a horribly painful death.

As early as the sixth century BC, Greek lyric poets told of the anguish and death resulting from punctures by Heracles' arrows befouled with Hydra's venom. In a later century, Apollonius Rhodius explained that the Hydra's poison, inoculated by Heracles' arrow, killed Ladon, the drakon of the Hesperides (Chapter 27). Even flies perished in the festering wound, indicating the lack of oxygen.

The Environmental Connection

I am curious as to why the writers placed the battle of Heracles and Hydra in a coastal karstic setting, and why a crab was identified as an antagonist. Hence I wonder whether the story had a naturalistic basis.

In Chapter 22, I describe the coastal setting of Lerna, where crabs would be abundant. A crab's skin-breaking pincer-bite could set the stage for a bacterial skin infection. Similarly, a small laceration can become infected after someone steps barefoot on a seashell or fish-hook. Additionally, certain Mediterranean fish such as the "weaver" fish possess venom-containing spines that have distressingly painful, toxic effects on humans who are wounded by the spines and inoculated by their toxins. These fish often burrow in the sands of shallow waters.

In my reading, the mythographer's description of Hydra wrapping herself around Heracles' leg is similar to the description of Python wrapping around Mount Parnassus (Chapter 13). In both cases, I wonder whether the snake represents illness. For example, I suppose that the Hydra could have represented malaria, which is known to have impacted Lerna and various other regions of ancient Greece. But it seems evident to me that the mythteller was figuratively describing a spreading bacterial infection with tissue necrosis. In the remainder of this chapter, I ponder whether

the Hydra represented a fatal bacterial infection caused by an exposure of Heracles' broken skin (via the crab-bite) to a contaminated crab pincer, contaminated seawater, or both.

REVENGE OF THE HYDRA

In mythological chronology, Heracles died a considerable time after he battled the Hydra. And yet I think the mythwriters were expanding the timeframe of events based on real life. In other words, I think Hydra's poison killed quickly, and that her lethal power cannot be divorced from the Lernaean environment in which she once lived.

The story of Heracles' death is mainly told by Diodorus Siculus, Apollodorus, Ovid, and Hyginus. The story begins with Nessus, a centaur who served as ferryman at the Aetolian River Evenus, north of the Gulf of Patras. Deianeira was a princess whose hand Heracles had won by fighting the river god Achelous, an Aetolian river west of the Evenus (Chapter 10).

When the River Evenus was turbulent from winter rains, Nessus carried Deianeira across on his back. During the crossing, Nessus attempted to rape Deianeira. Heracles took an arrow dipped in Hydra's gall and shot it through Nessus's heart.

As he was dying, Nessus persuaded Deianeira to mix some of his semen and blood as a love-potion to arouse Heracles's dwindling passion. (Deianeira feared that Heracles was about to forsake her for another woman, Iole.) Nessus instructed Deianeira to douse Heracles' shirt with the potion. In a similar account, Ovid says that Nessus gave his blood-smear shirt to Deianeira, telling her that the blood-imbued garment would fortify her husband's failing love. Although Deianeira was unaware of the danger, Nessus knew that his blood was poisoned, and in this way he intended to get revenge against Heracles.

Hoping to save her marriage, Deianeira gave the venom-bearing shirt to Heracles as a gift. In some accounts, Lichas handed Heracles the shirt—an innocent action for which Heracles later threw him into the Euboean Sea. Regardless of who handed Heracles the garment, the wearing of it caused the hero to contract Hydra's poison.

Ovid notes that Heracles' body heat freed the "deadly force," allowing it to seep and steal along, spreading through Heracles' limbs. Diodorus Siculus says that as the poison-infused shirt became heated, it attacked the flesh of Heracles' body. Apollodorus asserts that the garment grew warm as the Hydra's venom began to cook Heracles' flesh.

Soon the Greek hero could no longer stifle his groans as the agony became unbearable. As he desperately tore away pieces of the shirt, he tore away pieces of his own skin. Ovid says that either the shirt stuck to his burning flesh, or else it laid bare his lacerated muscles and huge bones.

Ovid continues, “Heracles’ very blood bubbled and hissed as when a white-hot blade is quenched in icy water.” The flames licked inward, “greedy for his guts.” Dark perspiration streamed from every pore. “His scorching sinews crackled; the blind rot melted his marrow.” To escape the pain, Heracles ultimately threw himself into the flames of his funeral pyre. But the hero’s body was taken up into Heaven, and he became immortal.

In a related story, the kindly centaur Chiron had been accidentally injured by an arrow poised by Hydra’s venom. He gave up his immortality so that he could die and thereby escape the pain. Chiron gave his immortality to Heracles. But immortality was of no benefit when the individual was in excruciating pain.

A Medical Interlude

In the fifth century BC, the ancient Greek physician Hippocrates described a soft-tissue infection that gruesomely led to flesh, sinews, and bones falling away in large quantities. Interestingly, nearly identical descriptions were found hundreds of years later in the accounts of Hydra’s poison.

Today we know that certain strains of bacteria can find their way into skin tissue via a seemingly innocuous cut or scrape, ultimately causing a severe infection. Streptococci bacteria often are involved, but are not the only bacterial cause. If the infection is not treated, the bacteria can produce enough enzymes and toxins to almost dissolve flesh. The abnormal death of tissue is called necrosis.

Fascia are fibrous layers of tissue that envelope muscles and that also lie between the deepest layer of skin and the subcutaneous fat. Necrotizing fasciitis is a rare but insidiously advancing soft tissue infection in which bacteria destroy tissues underlying the skin. One subtype, popularly but incorrectly called flesh-eating disease, can be fatal in as little as twelve to twenty-four hours. Other types of necrotizing infections also can be disastrous.

Usually either a physical trauma or a skin injury—even a minor one—precedes a necrotizing infection. In some cases, necrosis can be traced to one or more bacteria types found in saltwater. Fishers, fish-handlers, and consumers of raw seafood are especially at risk.

Once a wound is inoculated with a dangerous bacterial strain, the stage is set. Usually the infected area begins to look red and swollen and starts to feel hot and extremely painful.

As bacteria grow beneath the skin's surface, they produce toxins that destroy soft tissue. Underlying muscle may be affected. Necrotizing infections may cause subcutaneous bleeding, putrid discharge, soft-tissue gas production, and gangrene, among other symptoms.

Was Heracles Killed by a Necrotizing Bacterial Infection?

If I examine the Hydra and Heracles myth apart from its environmental connection to Lerna, I would consider it as just another tale of poisoned garments. Or it could be metaphorically interpreted as an inescapable misfortune or destructive force. But I cannot help wondering why the Hydra was from Lerna, and why the backstory of Heracles' death took place in the Lernaean lagoon. Statements by Ovid lead me to believe that the hero's death was caused by a necrotizing infection acquired after the skin-breaking pinch of a crab. The coastal setting is realistic because high concentrations of dangerous bacteria (such as certain *Vibrio* species) often are found in seawater environments.

In describing Hydra's ability to regrow twofold its decapitated heads, Ovid asserts that the Hydra "throve on wounds." Heracles goes on to say that the branched serpents "sprang from death and multiplied on doom." Ovid observes that the Hydra gained from loss, and with doubled strength.

These descriptions are consistent with the devastating progression of a necrotizing infection. Dying tissue and its byproducts provide "food" for more bacteria. More bacteria produce more enzymes and more toxins in a rapid spiral downward.

Once strep succeeds in penetrating deeper tissue layers with its cutting and liquefying enzymes, a chain reaction begins: muscle cells killed by strep release potassium, phosphate, and other cellular byproducts that poison adjacent muscle. Strep feasts on the remains and oozes new waves of deadly toxins. At that point, the only hope for survival is to excise wide swaths of flesh.

Necrotizing infections progress rapidly. Even without much evidence of severe infection on the skin surface, the flesh-destroying toxins can move at almost visible speed, leading to the horrendous loss that Hippocrates and the ancient mythographers accurately described.

Certain streptococcus enzymes can dismantle connective tissue, blood clots, and other tissues in its path. Toxins sabotage blood vessels and cell membranes, flooding organs with oxygen-blocking cellular sludge. In advanced stages, the normal skin and subcutaneous tissue can be loosened from the deeper necrotic tissue. Hence, Ovid was not exaggerating when he described Heracles's skin falling off, exposing his muscles and bones.

Ovid's auditory description of hissing, bubbling blood is an actual occurrence caused by the presence of gas-forming organisms. Subcutaneous air often is observed in necrotizing fasciitis. In advanced cases, septicemia ensues with systemic toxicity and rapid death.