Stiff: The Curious Lives of Human Cadavers Study Guide

Stiff: The Curious Lives of Human Cadavers by Mary Roach

BOOKRAGS

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Plot Summary

Mary Roach begins her research of human cadavers by attending a facial anatomy and facelift refresher course, where surgeons practice new techniques on the freshly severed heads of human cadavers. Roach learns that surgeons cope by objectifying human remains, willfully seeing them as objects. The author sees the obvious benefit of learning surgical techniques using cadavers. Since they feel no pain and cannot die due to complications, cadavers offer immediate benefits for surgical study. She sees this as a great improvement over how surgery was once taught on live patients without the benefit of anesthesia.

Roach visits the gross anatomy lab of University of California San Francisco. She attends a surprisingly touching memorial for the lab's unnamed cadavers and is impressed at the respect the students offer their cadavers. She notes that a lot has changed since the shady "body snatching" days of early medicine. Next she visits the University of Tennessee to observe field research on the decay of human bodies, where she is shown a series of cadavers representing increasing stages of decay. Roach discovers that not even embalming can prevent the eventual decay of organic tissue.

At Wayne State University, Roach watches how cadavers are used in impact studies. Despite being very controversial, cadavers have made great contributions to the evolution of car safety, particular with regard to windshields and steering wheels. Later, Roach meets with the injury analyst who investigated the crash of TWA flight 800. Here she learns how the aggregate wounds suffered by deceased passengers can tell the story of what happened in the moments just before an air disaster.

Roach observes the way cadavers are used in research involving weapons and ballistics. Although society frowns on such a thing, the author sees that such study can be undertaken for humanitarian purposes. She is less impressed, however, with cadavers used to promote religious propaganda, such as the studies undertaken to prove the efficacy of the Shroud of Turin. At UCSF medical center, however, Roach is touched and awed by the sight of a "beating heart cadaver" having its still-functioning organs removed by doctors.

Next Roach considers the seat of the human soul, looking at decapitation, reanimation, and head transplants. She briefly touches on several moments of history ranging from the guillotines of the French revolution to the weirder experiments of modern neurosurgery. Roach then considers medicinal cannibalism, looking at historical examples of how and why humans have eaten one another. She takes a trip to China to investigate a particularly morbid tale.

Roach considers alternative funerals, looking at tissue digestion and human composting. Both methods are more environmentally sound than traditional means, but are unusual enough to give most people pause. The author closes out the book by considering her own eventual funeral. After looking over several options, she ultimately decides that, since he is not going to be around to benefit from any of her decisions, she

should allow her husband to do whatever he needs to do to make peace with her passing.

Chapter 1, A Head is a Terrible Thing to Waste

Chapter 1, A Head is a Terrible Thing to Waste Summary and Analysis

Chapter 1 addresses using cadavers to teach surgical techniques. Author Mary Roach attends a facial anatomy and face lift refresher course, watching as surgeons practice on decapitated heads. Realizing that severed heads can prove daunting even for trained professionals, the author asks one of the attendants, Theresa, how she copes. Theresa explains that she prefers to think of the heads as if they were made of wax.

Roach explains that objectification is the coping mechanism that allows surgeons to dissect something which so closely resembles a living human being. Heads and hands are the most familiar and therefore psychologically difficult for doctors to work with. Objectification affords needed emotional distance.

The doctors, while clearly nervous, both because they work with human remains and because they are conscious of being observed, see the exercise as a learning opportunity. The deceased are beyond having an opinion, but the author wonders briefly whether they would approve of their remains being used to train plastic surgeons. Ultimately, Roach decides that if such procedures are to be performed, they must be performed well.

A participating surgeon, Marliena Marignani, finds hands emotionally difficult to work with, but she appreciates that cadavers do not bleed, affording greater visibility during the procedure. The author observes that many hospitals do not have ready access to cadaver specimens outside of the odd amputation. Working with a head is therefore significant. Roach admits that she was surprised to learn that most physicians still learn new skills in the midst of live surgery.

Before the early 1800s, surgeons operated without anesthesia and with little skill, promoted more by nepotism than by success. Their patients, often poor and undergoing experimental procedures, held little hope for survival. These early procedures, Roach explains, were often attended by an audience that included many morbid thrill-seekers. Even with the advent of anesthesia, the patients of teaching hospitals found themselves subjected to unnecessary medical procedures for the sake of training new surgeons. The author speaks with Hugh Patterson, who runs the willed body program of UC San Francisco's Medical School. He contends that, since patients insist upon experienced doctors, it can be very difficult to train new doctors. Patterson advocates that cadaver anatomy labs be added to the curriculum.

Marignani, citing a lack of respect for cadavers, admits that she does not plan to donate her body to science. She disapproves of the way that the severed heads are

photographed without the express consent of the donors. Roach notes that Marignani is self-conscious and respectful of the head she has been assigned.

Chapter 2, Crimes of Anatomy

Chapter 2, Crimes of Anatomy Summary and Analysis

Chapter 2 concerns the dignity, or lack thereof, of human remains. Roach attends a memorial service for the unnamed cadavers of UCSF Medical School class of 2004 gross anatomy lab. While there are the usual funereal arrangements, the dismembered cadavers are conspicuously absent. The memorial is a serious occasion. Residents take turns singing songs and reading. The author is particular touched by one student's heartfelt and grateful tribute to a past cadaver.

Over the last decade, medical schools have made a concentrated effort to instill in their students a respect for the dead. At Hugh Patterson's invitation, Roach tours the gross anatomy lab and speaks with the students. She finds the resident surgeons open, honest, and respectful of their cadavers. Historically, Roach notes, this has not always been the case. In Alexandrian Egypt, Ptolemy I, fascinated with dissection, allowed early anatomists to cut open the remains of executed criminals. Later, Herophilus, the "father of anatomy," took to dissecting live criminals. In 18th century Britain, the growing number of anatomy schools soon exhausted the only legal supply of cadavers: executed murderers.

With cadavers in high demand, surgeons of 18th century Britain took to dissecting their own dead relatives and eventually, body snatching. While there were laws against stealing heirlooms buried with the corpse, there were no laws against stealing the corpse. Some anatomists would hire unscrupulous "resurrectionist" thugs to do the body snatching. The best known surgeon-anatomist, Sir Astley Cooper, decried resurrectionists even as he employed them. The author contends that Cooper paid to have former patients unearthed to check on his surgical handiwork. Morbidly, Cooper was also known to gift his colleagues with bone intaglio nameplates that he formed in the gastric acid of dogs.

Roach suggests that anatomists tended to objectify the dead just as much as the body snatchers did. Dissections were undertaken with the air of street-theater, and human remains scattered without care. Persistent rumors suggested that anatomists disposed of human flesh by feeding it to animals or by rendering it into wax for soap or candles.

Robert Knox, a 19th century Edinburgh anatomist, purchased corpses from the murderers Hare and Burke. Such practice continues, says Roach, citing an incident in 1992 Colombia, where social cleansing squads provided fresh corpses to a local university. Neither Hare nor the conspirators from the Columbian incident were charged. Knox was likewise never charged, even though public opinion found him complicit. Burke was eventually brought to justice, executed, and subsequently dissected, his skin made into wallets. After the Knox incident, the British parliament was forced to address the legal issue of cadaver scarcity.

Roach cites several historical examples of ignorance displayed by physicians who were not allowed to learn anatomy through dissection. She refers to a document from 10th century China, where Confucian doctrine forbade dissection, in which the author describes human organs both vaguely and inaccurately. Two of history's most revered anatomists, the Roman Galen and the Greek Hippocrates, never dissected a human cadaver and, as a result, held misconceptions regarding the human form.

The most significant contributor to anatomical study, Roach claims, was the Belgian anatomist Andreas Versalius. He advocated direct and hands-on interaction with human remains. Hugh Patterson suggests to Roach that "hands on" might not be as important as it once was. With medical technology continuing to advance, there is less need for actual dissection. Today, students might either look at embalmed and carefully-cut sections of cadavers or else 3D reproductions. Roach points out that dissection is as much about confronting mortality as it is anatomy, but concedes that there are other ways to learn that lesson.

Chapter 3, Life After Death

Chapter 3, Life After Death Summary and Analysis

Chapter 3 addresses human decay. Roach visits the University of Tennessee Medical Center, which is home to the only field research on the decay of human bodies. Researchers leave bodies to decay in natural environs and then monitor their stages of chemical composition. This data assists criminal investigations by creating scientific baselines to determine time of death. Smell, temperature, insect infestation, and other factors are monitored and considered.

Research professor Arpad Vass, the author's escort, introduces Roach to a series of cadavers, each one more decayed than the last. The first is an overweight man in sweat pants. Small sections of skin are sloughing off, maggots playing just below the surface. Vass explains that the resident bacteria, once held in check by the immune system, are now devouring the tissue.

The second cadaver, a horribly distended male corpse, is Vass's example of bloat. As bacteria digest the internal organs, gases are created and subsequently trapped in body. This stage lasts about a week, until something inside gives and the body deflates. Maggots are again present, this time much larger. Vass moves on to his final example of putrescence. The female cadaver exists in a "mud of her own making," where her tissues are almost entirely turned to liquid. Vass explains that remnants of internal organs can be identified for only up to three weeks after death. Outside the gate, Roach notes that the smell of death still clings to her. She characterizes the smell as dense, cloying, and sweet but unlike a flower. Technology exists both to detect the smell of putrescence and to emulate it to find dead bodies. Technology enables the training of dogs to do the same.

Curious about preservation, Roach visits the San Francisco College of Mortuary Science. Two students wash and groom the body of a 75-year-old man. Viscous liquid, pushed up the esophagus by gas buildup, is seeping from the cadaver's mouth. The students wipe the "purge" away and shave the man's face. The eyes are then stuffed with cotton and "eye-caps" placed beneath the lids to keep them closed. The mouth is sutured closed.

The author digresses to give a brief history of embalming. Until the Civil War, dead soldiers were buried where they fell. Loved ones could send for the body later at great expense. Until embalming was perfected by Thomas Holmes, and subsequently demonstrated by the well-preserved body of President Abraham Lincoln, few options were available. Roach claims that Holmes slowly went mad. In the end, he asked that his body not be embalmed.

Roach watches as one of the students connects a tube to a now-exposed carotid artery. The pump is started and formaldehyde flows through the same circulatory system that

once held blood. The formaldehyde lends a remarkable semblance of life to the decedent. The effect is intended to last only for the funeral. Despite the long ago claims of undertakers, embalming will not preserve a cadaver forever. Eventually, embalmed cadavers will succumb to putrescence.

Chapter 4, Dead Man Driving

Chapter 4, Dead Man Driving Summary and Analysis

Chapter 4 looks at cadavers used in impact studies. Roach visits Wayne State University to watch cadaver UM 006 get hit with a linear impactor during a crash simulation. Researchers hope to determine how much force a human shoulder can withstand in a side-impact before it suffers serious injury. The author digresses to give a brief history of how cadavers have contributed to car safety. Cadavers have given scientists a better understanding of how injury is suffered, particularly to the brain and nervous system. Safer windshields and steering wheels are the result.

Cadaver research has proven contentious, but it became apparent that the best stand-in for a human is a human cadaver. Animals, even apes, do not have the same biology as humans and are therefore only useful test subjects when functioning organs are required. The one exception is pediatric study, where animals are used almost exclusively. Children do not donate their bodies to science, and doctors are loathe to ask this of bereaved parents.

Roach meets with a team of scientists at Wayne State. The cadaver, UM 006, is wheeled in. He wears a hood to conceal his identity. The cadaver is fitted with a series of sensors that will measure impact. Side impact accidents afford the occupant less protection. UM 006 will experience a lower-speed impact than its predecessor cadaver, which was severely damaged.

The scientists struggle to get the limp cadaver into a driving posture. Once in position a final check is made. The piston is fired, and the cadaver is impacted. The corpse falls onto an awaiting cushion. Roach ponders that UM 006's family doesn't know what just transpired. To truly know or understand what happened, she reasons, they would have to speak to the researchers themselves.

Roach speaks to Mike Walsh, an investigator for the research center. He says that he generally tells families more than they prefer to know about the fate of their love one's body. Even so, he adds, families rarely renege on their consent. Roach reveals that, in Britain, researchers bypass familial consent by referring to cadavers as parts rather than whole remains. She sees this as impractical because some research requires a whole cadaver. It can be vitally important to see how a body part behaves as part of the whole.

Chapter 5, Beyond the Black Box

Chapter 5, Beyond the Black Box Summary and Analysis

Chapter 5 concerns the human remains of mid-air disasters. Roach meets with injury analyst Dennis Shanahan. Although he normally investigates the claims of injured people looking to sue companies, Shanahan is occasionally called upon to investigate air disasters, such as TWA Flight 800. Roach is curious to know how one endures having to piece together a puzzle so grim.

When the black box cannot tell the story of what happened to a downed plane, investigators must consult the "human wreckage." At Shanahan's recommendation, Roach consults a book called Aerospace Pathology. She sees the kind of story that a corpse might tell based on the quality of its wounds relative to where the person was seated on the plane. With Flight 800, Roach explains, Shanahan was looking for evidence of a bombing.

Investigating Flight 800 was emotionally difficult for Shanahan, since there were so many young people on board. Most of the bodies were disturbingly intact. Shanahan says that he copes by focusing on the parts, rather than the whole person. The author notes that "intactness" says something about the disaster. Explosions, such as those created by bombs, tend to cause "body fragmentation."

In addition to the lack of fragmentation, Shanahan also did not find the foreign objects that an explosion would have embedded in the bodies. While the passengers did have chemical burns, they were not consistent with a missile attack. Instead, the burns were postmortem and caused by jet fuel. Shanahan deduced that the fire briefly swept through the cabin, after which passengers were pulled from their seats and thrown from the plane.

Evidence suggests that the passengers died of extreme water impact, their aortas torn apart by the shearing force of a sudden stop. This theory is supported by signs such as broken ribs and lacerated lungs. Shanahan believes that, while the passengers were alive until their sudden end, they were likely too overwhelmed to be aware of what was happening. It was later discovered that Flight 800's fuel was ignited by a spark from frayed wiring. Roach closes the section by asserting, with evidence, that a fall from a mid-air disaster leaves little chance of survival.

Roach gives a short history of injury analysis, which began in 1954 when two British Comet passenger planes mysteriously dropped into the sea. The investigations were carried out by Britain's Royal Air Force Institute of Aviation Medicine and followed a similar pattern to that of the later Flight 800. The investigators performed several experiments to prove the legitimacy of death by extreme water impact, including

subjecting guinea pigs to similar conditions and, through use of dummies, proving that clothes would be knocked off during long falls, as they were in both incidents.

Roach lunches with Shanahan at a beachside Italian restaurant. The two discuss injury analysis. Shanahan says that he does not fear air travel because 80 to 85 percent of crashes occur at takeoff or landing and are potentially survivable. When deaths occur in such circumstances, they are usually due to fire and panic. Roach claims that more could be done to ensure airline safety, but explains that both profit and politics stand in the way.

Chapter 6, The Cadaver Who Joined the Army

Chapter 6, The Cadaver Who Joined the Army Summary and Analysis

Chapter 6 addresses cadavers in weapons and ballistics research. Roach relates the story of Captain Louis Le Garde of the U.S. Army Medical Corps, who in 1893, was ordered to use cadavers to test two rifles: the new 30 caliber Springfield and the standard issue 45 caliber. The hope was that the smaller caliber would prove less deadly but just as effective at stopping the enemy. The experiment was inconclusive since stopping power cannot be judged against something which is already stopped.

Most ballistics research is done on animals with similar anatomy to human beings. Roach is curious as to why people fall down when shot, even when not seriously wounded. Ballistics expert Duncan McPherson, of the Los Angeles Police Department, believes the behavior is purely psychological. People fall because they realize they've been shot. Roach reasons that this explains Le Garde's difficulties stopping the Moro tribesmen. Since they were unfamiliar with firearms, the tribesmen did not know what it meant to be shot.

Not everyone agrees with McPherson's theory. A neurologist named Dennis Tobin believes it is due to an overload in a part of the brain stem called the Reticular Activating System, a theory which has some, albeit shaky, support in animal testing. Proponents of the neural theory believe that the overload correlates to the "temporary stretch cavity" caused when a bullet displaces tissue. The bigger the cavity, the better the stopping power. Roach participates in a ballistic test, firing bullets into gelatin so she can see the stretch cavity firsthand.

Rick Lowden, materials engineer and bullet expert, recalls working with the University of Tennessee's human decay facility to study corrosion of bullets embedded in decaying human flesh. Concerned with precision, Lowden implanted the bullets surgically rather than firing at the corpses. He also explains to Roach that he believed he "wasn't allowed" to shoot human remains, citing a previous incident in which his employers threatened to terminate his project if he fired upon cadaver legs. Even shooting livestock, Lowden adds, carries a stigma.

The military has only recently returned to cadaver research and only for humanitarian purposes. Commander Marlene DeMaio of the Armed Forces Institute of Pathology's Ballistic Missile Trauma Research Lab used cadavers to test the efficacy of personal body armor. Although this method is objectively more effective than trial-by-fire methods, DaMaio met sociopolitical resistance to using cadavers.

Colonel John Baker, a legal counsel for one of the unnamed federal institutions funding DeMaio's research, explains that democratic politicians, as well PETA, have tried to shut the research down. The concern is that families of the deceased might bring suit if they learn how their loved one's remains were used. At issue is the idea of "informed consent." If researchers spare the family's feelings by omitting details of the research, they risk offending the family later. The usual compromise is to be quite general in description when characterizing research.

Roach contends that one of the least socially acceptable things that one might do with a cadaver is to blow it up. At least one expert argues that cadavers are ill-suited for "air blast" research since their lungs are inoperable and pressurized air is most damaging to the lungs. Despite the social resistance against such research, one group lead by Lieutenant Colonel Robert Harris of the Army Institute of Surgical Research, was able to provide insight into which footwear is safest for mine clearance teams to wear by using cadavers.

Chapter 7, Holy Cadaver

Chapter 7, Holy Cadaver Summary and Analysis

Chapter 7 looks at how cadavers were used to investigate the Shroud of Turin. In 1931, Father Armailhac, a Roman Catholic priest, asked Dr. Pierre Barbet to prove the scientific efficacy of the Shroud of Turn as the burial cloth of Jesus Christ. Barbet became focused on stains that seemed to depict a split flow of blood. Barbet felt that they were caused by Jesus repositioning himself on the cross to avoid suffocation. Barbet tested this theory by crucifying a cadaver. The corpse, however, could not be coaxed to reposition itself, and so the angle of the second flow could not be measured.

Skeptical that a nail through the palm would be capable of supporting half the weight of an adult male, Barbet tested the theory by nailing up a newly amputated arm attached to a 100-pound weight. As suspected, the weight was too much. Barbet went through a dozen amputated arms, finally deciding "as though through divine intervention" that the nail went through part of the wrist called "Destot's space." Barbet then claimed that the location exactly matched the location of the wound in the Shroud of Turin.

Roach introduces Frederick Zugibe, an overworked medical examiner from New York. Finding Barbet's research insufficient, Zugibe took a special interest in the Shroud of Turin fifty years ago. Zugibe, like Barbet, performed mock crucifixions. Rather than using cadavers or severed arms, Zugibe affixed live volunteers to crosses using leather straps. Volunteers did not, as Barbet posited, have any trouble breathing, nor were they able to reposition themselves with their feet flush to the cross. Zugibe was also able to reproduce the second stream of blood by washing the wound of a freshly slain man. Lastly, Zugibe proved that Barbet had incorrectly located "Destot's space."

Roach closes out the chapter by taking issue with Barbet's claim that "our poor science" should not be used "merely to alleviate the pains of our brothers" but instead to enlighten them. The author contends that there can be no greater office than relieving pain and certainly not that of religious propaganda.

Chapter 8, How to Know if You're Dead

Chapter 8, How to Know if You're Dead Summary and Analysis

Chapter 8 considers the definition of death, live burial, and the search for the soul. Roach watches as "beating-heart" cadaver, referred to as "H," arrives at UCSF medical center. H is brain dead, but her still-functioning organs will be recovered to save the lives of people desperately in need of transplants. One doctor will fly in from Utah to recover H's heart. Her liver and kidneys will be transported two floors down.

Roach watches as the surgeon uses a cauterizing wand to cut H open from neck to pubic bone, filling the air with the smell of seared meat. H's sternum is sawed lengthwise, and her ribs are parted, exposing her still-functioning internal organs. Roach struggles with the notion that H is a cadaver and not a living person. Beating-heart cadavers take a particularly large toll on the ICU staff who works to keep the cadaver "alive" until the time of organ recovery. This confusion over life and death is nothing new. Before brain death was understood, life and death were determined solely based on the presence or absence of a heartbeat. Despite this delineation, some afflictions made a beating heart difficult to detect and many feared being buried alive.

Roach lists a variety of ridiculous and humiliating methods by which a mortician might detect a living person. Most of these involve an attempt to inflict pain. None of these methods caught on. Eventually, special buildings were used to house the recently deceased. Once the body began to smell, the morticians knew for certain that the cadaver was indeed a cadaver.

Some scientists hoped to determine the time of death by recording the departure of the soul. In 1907, Dr. Duncan McDougal published a paper describing his efforts to measure, in weight, the departure of the soul. After carefully monitoring six dying patients, McDougal concluded that each patient has lost three-fourths of an ounce of weight. Later, similar experiments with dogs showed no loss of weight, keeping with religious doctrine that animals have no soul. McDougal's paper ignited considerable debate.

Looking at H's liver, now exposed in H's chest, Roach can see why people once believed the impressive-looking liver to be the seat of intelligence. The doctor from Utah, referred to simply as "Utah," arrives to recover H's heart. Roach is struck by how calm the man seems. Utah clamps off the valves of the frantically beating heart and deftly cuts the organ free. H dies a second time. The heart continues beating as it is placed on ice.

The modern medical community, Roach explains, is unequivocal about death being defined by brain death. The legal community took a bit longer to catch up, finally agreeing to the definition when forced to decide guilt between a violent offender who left

his victim brain-dead and a doctor who later recovered the victim's heart. However, Roach reminds that a rational acceptance of brain death does not equate to an emotional acceptance.

Strangely, some organ recipients exhibit different behaviors after transplantation, believing that they have in some way inherited characteristics from the donor. Roach finds no evidence that such is the case. The phenomenon, while interesting, appears to be entirely psychological.

Chapter 9, Just a Head

Chapter 9, Just a Head Summary and Analysis

Chapter 9 looks at decapitation, reanimation, and head transplants. Since the brain is supposedly the seat of consciousness, Roach reasons, it might be possible to communicate with a recently severed head in the seconds before it expires. Led by this notion that a severed head might briefly maintain awareness, Dr. Joseph Ignace Guillotin, the man after whom the Guillotine was named, rescinded his support of decapitation as a humane form of execution.

Despite Guillotin's concern, the Guillotines of late 18th century France continued operation. Any scientific test of severed-head-awareness was deemed too ghastly to consider. Nevertheless, the idea had entered the public consciousness. This idea persisted until Georges Martin, assistant to the Paris executioner and witness to 120 beheadings, testified that severed heads were motionless after decapitation. Medical science was satisfied for the moment.

In 1812, a French physiologist named Legallois published a paper that theorized that a recently severed head, infused with oxygenated blood, might be restored to consciousness. Some forty-five years later, the French physician Brown-Sequard tested Legallois's theory with the head of a severed dog. Seeming to support Legallois's hypothesis, the infused dog-head exhibited movement that Brown-Sequard judged to be voluntary.

In 1884, Frenchman Jean Baptiste Vincent Laborde performed several experiments on the severed heads of the newly executed. Initially, these experiments focused on the brain and nervous system, but Laborde also attempted blood infusion. On one occasion, much to the shock of those present, he was able to produce facial movements by passing electrical current into the brain. He also, on another occasion, attached a severed human head to the circulatory system of a living dog. Roach points out that all of Laborde's experiments involved heads which were most certainly already brain dead.

Laborde soon lost interest in heads, but two other Frenchmen, Hayem and Barrier, took up the cause, transfusing a total of 22 dog heads using blood from life horses and dogs. They would write a paper chronicling the three stages of neurological activity following decapitation, affirming Guillotin's fear that consciousness persists after decapitation. Eighteen years later a French physician named Beaurieux would confirm Hayem and Barrier's observations when he witnesses unmistakable awareness from the severed head of a recently executed criminal.

By 1908 Charles Guthrie and Alexis carrel discover anastomosis, the stitching of one vessel to another without leaks. Guthrie was then able to graft a severed dog head on to the body of another dog, creating the first manmade two-headed animal. The transplanted head, however, was too long without oxygen, and therefore had already

succumbed to brain death. The creature lived only seven hours before complications set in and it had to be euthanized.

In 1950, a Soviet scientist named Demikohov grafted the head, shoulders, lungs, and forelimbs of twenty puppies onto the bodies of full-grown dogs. He was able to minimize the time that the transplanted heads went without oxygen by using "blood-vessel sewing machines." The animals typical lived only two to six days before the recipient's immune system would reject the donated material.

In the mid-1960s a neurosurgeon named Robert White figured out that cooling the brain slows cellular damage. Further, since the brain alone enjoys "immunological privilege," White discovered that he could embed a monkey's brain within the abdomen of another animal and have the organ subsist on the blood of the recipient animal. Roach meets with White in person, asking him the question that many before her have asked. Her question is, "What is going on inside the brain of that monkey?" Dr. White admits that the monkey likely went insane.

Roach and Dr. White discuss the possibility of a head transplant. White sees it as plausible and argues that, although it is not possible to reconnect spinal nerves, a quadriplegic could gain ten or twenty more years of life, with no change in the quality of that life by receiving a new body with fresh organs. In 1971 White had success in transplanting monkey heads from one body to another. White adds that he sees no reason why it should not work with humans and says that he would be happy to undertake such a challenge with a willing recipient and proper funding. Interestingly, White is a devout Catholic and a member of the Pontifical Academy of Sciences or the group whose responsibility it is to keep the Pope up to date on scientific matters.

Chapter 10, Eat Me

Chapter 10, Eat Me Summary and Analysis

Chapter 10 examines medicinal cannibalism. Roach begins by describing the process by which an aged man of 12th century Arabia might sacrifice himself to become a medicinal confection known as a "mellified" man. After eating only honey for a month, the man dies and is placed subsequently in a coffin full of honey. After a hundred years, the coffin is opened and its "mellified" contents are used as a topical application for broken or wounded limbs. It may also be taken internally to "cure the complaint." This recipe comes from the 1597 Chinese Materia Medica.

Roach mentions that the medicinal use of mummies is a well-documented fact, particularly in chemistry books of the 16th, 17th, and 18th century Europe. The best mummies were thought to be from those who died suddenly, the "surprisal" of their death supposedly concentrating the spirits within the body. In 18th century Alexandria the demand for medicinal mummies was high enough that counterfeit mummies, doctored with pitch and dried in ovens, began to appear.

Mummy elixir was prescribed for a wide range of maladies, different body parts for different ailments, some complaints being so minor that that cure was comparatively worse. In cases of serious illness the patient was often better off ignoring the doctor's advice, particularly when it involved ingesting human excrement.

Historically, there are many examples of opportunists or people other than just druggists, who sold blood or body parts for medicinal purposes. Usually such stock came from convicted criminals or gladiators in ancient Rome. Even such things as human fat and menstrual blood were thought to have curative properties.

The idea behind medicinal cannibalism was that one could find curative properties in something that was associated with the ailment. A tonic made of hair, for example, might be considered a cure for baldness. In some cases the cure would work, but for poorly understood reasons. Since many ailments go away on their own, it's easy to see how such cures might acquire a false efficacy. Roach concedes that such practices seem ghoulish, but also points out that, even today, such things as human growth hormone and blood transfusions, are common medical treatments.

In 1928, a Soviet surgeon by the name of V.N. Shamov discovered that he could transfuse living dogs with the blood of dogs which had been dead for less than six hours. Two years later, the Sklifosovsky Institute in Moscow, having heard of Shamov's research, duplicated the experiment with human subject. Soon, it became general practice for corpses to be drained of blood before burial. The dead-to-living blood transfusion would not be duplicated in the United States until 1961 when Dr. Jack Kervorkian transfused blood from four corpses without notifying any of the involved parties.

Roach cites that the only human part mentioned in the Chinese Materia Medica still consumed medicinally in the United States is the eating of placenta to stave off postpartum depression. Roach reveals that in China, from the Sung to Ming dynasty, young women were sometimes called upon to aid their ailing elders by making an elixir from a part of their body. She notes that, in modern China, rumors persist of people consuming fingers, toes, nails, dried urine, feces, breast milk, and even aborted fetuses. Roach finds there is some truth to the last one, as aborted fetal matter is a component for a skin treatment drug called Tai Bao.

Roach feels that cannibalism has its place in a strictly rational society, but sees that the issue is complicated by ethical considerations. She considers several instances in which people, faced with starvation, have resorted to cannibalism. Roach considers the possibility than some such people may have developed a taste for human flesh. This last discovery however is difficult to verify.

Roach travels to China to investigate a Reuters story about two morticians accused of harvesting meat-for-sale from the corpses in their care. She finds the crematorium in question, but the director denies any knowledge of any such activity. Roach returns home empty handed.

The author closes out the chapter by considering a "why not?" attitude toward cannibalism. She concedes that raising humans as livestock is less energy efficient than primary herbivore stock. Despite this, her investigation finds few examples of people eating their own dead for general sustenance.

Chapter 11, Out of the Fire, into the Compost Bin

Chapter 11, Out of the Fire, into the Compost Bin Summary and Analysis

Chapter 11 looks at alternative funerals. Roach visits the Colorado State University Veterinary Teaching Hospital, where she finds herself in a giant refrigerator used for storing dead animals. The author is curious to see how death is dealt with when bereaved relatives are removed as a factor. She wants to see Colorado State's method of "tissue digestion" disposal.

The author digresses to speak of Kevin McCabe, the owner of a Michigan funeral home. Kevin wants to use tissue digestion, what he calls "water reduction," on human remains. The method can reduce an adult corpse to 3% of its body weight, with everything else becoming a sterile, coffee-colored liquid. This is achieved through pressure, heat and lye. The resulting fluid is safe enough to flush down the drain. Tissue digestion, Roach also notes, is both cheaper and cleaner than cremation.

Roach watches as several animal carcasses are hydraulically loaded into a large stainless-steel vat known simply as "the digestor." The tank is closed and "washing machine" sounds emit as the machine fills with water and chemicals. Roach returns the following day to see the vat opened. With the lid removed, Roach finds that she can't smell anything until she hangs her head over the vat, whereupon she detects a strong, unfamiliar smell. The attendant raises the basket from the vat and scrapes the crumbling bones into a bin. The coffee-colored liquid goes down the drain. Roach is skeptical that people will accept this manner of funeral for their loved ones.

The author runs through a quick history of cremation in America. Ironically, cremation advocates originally argued that the option was less polluting then burial. The first crematory was built in 1874 and the institution almost did not get off the ground due to its air of secularism. Roach points out, however, that funeral reform is often driven by utilitarianism, which when taken to the extreme, can be quite a deterrent to the public.

Roach, referring to Dr. George Hay's 1888 article extolling the benefits of using human remains as fertilizer, segues into the modern human compost movement. Roach travels to Sweden to visit a new company called Promessa. Founded by Wiigh-Masak, and backed by both the king and the Church of Sweden, Promessa offers a technologically enhanced form of organic and human composting. The method proposes the use of freeze-dried human remains as compost for a memorial tree or shrub.

Seeing Wiigh-Masak's impressive compost heap, Roach feels ashamed that she does not put forth a similar effort for the environment. Wiigh-Masak advocates death as part

of life and part of nature. She offers Roach some compost to smell. Roach is surprised that it does not smell like garbage at all.

The honor of being the first person to compost a human being goes to American Tim Evans. Evans, then a graduate student at the University of Tennessee, wanted to see whether or not human composting would be a viable option for third world countries. His method involved burying the subject whole and aerating the corpse regularly. The "intactness" of the body was difficult for Evans to achieve. The entire process took a month-and-a-half. Roach believes that, while compost is a wonderful idea, the American public is not quite ready for it yet.

Sweden is closer to accepting the idea. Many Swedes have gardens and so they appreciate the value of soil. The crematoriums in Sweden have been hit with environmental regulars concerning the mercury from filings. Burial is also less appealing for Swedes since, after twenty-five years, graves must be shared. Wiigh-Masak's biggest opponents lay among those whose livelihoods would be affected by a switch to compost funerals such as funeral directors, coffin makers, and embalmers.

Roach watches as Wiigh-Masak addresses a collection of potential investors. The affair is crashed by a funeral director, who accuses Wiigh-Masak of seeing people as bags of fertilizer. Afterwards, a corporate representative of Fonus, Scandinavia's largest mortuary corporation, implies to Wiigh-Masak that her audience was not as receptive as it seemed. While peaking to Roach, Wiigh-Masak refers to this man as "The Slime."

Wiigh-Masak strikes Roach as genuine and a true believer in ecological principles. Her sincerity seems to ring true with others as well, earning her a surprising number of supporters. Roach accompanies Wiigh-Masak to a meeting at Fonus. One of the Fonus executives reminds Roach that an American named Philip Backman had tried freeze drying human remains. The author is familiar with Backman. The man patented a process of freeze-drying humans remains but was unable to drum up support.

Ten Fonus executives listen to Wiigh-Masak pitch her ecological argument for twenty minutes. Afterwards, they ask her a series of questions. Wiigh-Masak explains that it is necessary to break up the corpse to facilitate its return to the soil. Further, freeze drying is necessary to remove the water. If the water is not removed, the remains will smell before they can be put to use. Wiigh-Masak adds that, although human beings are 70 percent water, the water is borrowed and changes every day. She concedes, however, that she does not have any good news for coffin makers. Wiigh-Masak's meeting with Fonus concludes with applause. A wary friendship has been formed.

Roach digresses for a moment to provide a Catholic perspective. She calls the U.S. Conference of Cathloic Bishops, where she speaks to one Monsignor Strynkowski. He feels that composting is disrespectful because it reminds him of a compost heap his family kept as a child. As for tissue digestion, he emphatically states that the Church would not support the idea of human remains going down the drain, but concedes, after some hesitation, that if the liquid remains were dehydrated into a powder, that would be acceptable.

Chapter 12, Remains of the Author

Chapter 12, Remains of the Author Summary and Analysis

Thinking of her own eventual demise, Roach considers the attitude of UCSF anatomy professor Hugh Patterson, who feels that in death he will continue to teach the subject that he loved in life. Roach ponders the idea of becoming an educational skeleton, but concedes that 80 percent of bodies left to science wind up as anatomy lab dissections. A skeleton, to Roach's mind, is at least aesthetically pleasing.

The author calls the University of New Mexico Maxwell Museum of Anthropology, which is one of the few locations that accepts donated bodies for skeleton harvesting. She is given her choice of watching either a "cut down" or a "pour off." The first involves a cutting away of the flesh and the second involves a dissolving of residual flesh by way of boiling. Since Roach does not live in New Mexico, and since the bones are not articulated into skeletons, she declines to donate her body to UNM.

No one in the United States, Roach discovers, is making skeletons for medical schools. The vast majority of such skeletons were once imported from Calcutta, but this ceased when India discovered that the demand for bones was inciting traffickers to kidnap and murder fifteen-hundred children a month. Today, most medical skeletons are plastic. Roach, who has dreams of one day becoming a medical skeleton, is discouraged.

Roach, who once considered donating her brain to the Harvard brain bank, shares one of her Salon articles detailing a visit to that institution. In the article, Roach confesses that her reason for considering the donation is purely egotistical. To her dismay, the brains of the "brain bank" are not suspended in glass jars full of formaldehyde, but instead are dissected, frozen, and kept in freezer bags. The article concludes with Roach listening as the spokesman explains that no one will be able to tell her corpse is missing its brain.

Once again, Roach is discouraged. She had hoped to become a "brain-in-a-jar," not several pieces of dissected tissue. Roach next considers the possibility of plasticized. Plastination is the process by which an organic tissue has its water replaced by a silicone polymer, thus creating a permanently preserved version of itself. The process was developed by Gunther Von Hagens, best known for his plastinated whole body art exhibit Korperwelten (Bodyworlds, in English.)

Roach visits the University of Michigan Medical School where several scientists are working on their own educational museum exhibit of plasticized bodies. In the lab, she handles several plasticized organs that are dry and without smell. Roach watches as a body is washed in preparation while another soaks in a tank of acetone. Once of the scientists, Dr. Glover, explains that the acetone drives the water from the corpse. Then

the corpse is placed in a low-pressure vat of polymer. The low pressure turns the acetone into a gas. When the gas escapes, the polymer rushes into take its place.

Ultimately, Roach decides that it is not her place to decide what happens to her remains. She feels that the decision of what to do with one's remains should be left to those still living who must live with the loss. Roach speaks of her mother, who agreed to see her husband cremated and laid to rest without a memorial against his wishes. Her mother would later, though ridden with guilt, bury her husband in the plot beside the one she had reserved for herself. With the exception of organ donation, Roach wants to leave her funeral up to her husband.

Characters

Mary Roach

Mary Roach is the author and, to a lesser extent, a character. According to the dust jacket, Roach has a background in journalism, having written for Salon, Wired, Outside, GQ, Discover, Vogue and the New York Times Magazine. Her writing style, at least in Stiff, is more characteristic of op-ed work rather than traditional journalism. Roach's tendency to write in the first person suggests that she makes little pretense of objectivity, instead preferring a more personal engagement with the material. Stiff is as much about the author as it is anything else.

Ever the pragmatist, Roach has a utilitarian rather than spiritual view of death. In Chapter 7 she is not shy about expressing her distaste for religious propaganda, nor is she hesitant to champion the humanist cause of reducing human suffering. Roach clearly sees the living as more significant than the dead. In her mind, the cadavers matter primarily in the ways in which they matter to the living. A corpse represents a lost loved one. Organs represent a second chance for a living person. To the author, a corpse might be thought of as organic tissue or it might be regarded as a symbol. It is however not a person.

Although rational, Roach is not unfeeling. She understands and experiences the human need to regard the dead with dignity. Roach herself confesses to feeling strong emotions in the vicinity of the dead. In Chapter 4, as she watches UM 006 prepared for a crash test, she cannot help but think of the cadaver's family and of what they might think. In Chapter 8, Roach is filled with compassion and gratitude as H's still beating heart is removed and recovered. This depth of emotion does not in any way contradict Roach's rationalism. It reinforces the idea that death is not for the dead but an experience for the living.

Experimenters

Throughout the pages of Stiff, the author refers to an impressive collection of surgeons, anatomists, and scientists stretching back to the dawn of history whose motives range from simple curiosity to blatant profiteering. One thing that all these people have in common is a willingness to get their hands bloody for the sake of experimentation. These individuals dare to see man not as a whole being but instead as a collection of blood, organs, and tissue.

When speaking of experimenters, Roach continually returns the theme of objectification. To do "what must be done," an experimenter must cease to regard tissue, even living tissue, as belonging to a fellow human being. A severed head therefore ceases to be made of flesh and blood, and is instead regarded as a wax facsimile. Human parts are

regarded discretely, rather than as part of a functioning whole. This defense mechanism provides emotional distances even as it risks dehumanization.

Objectified human remains are often denied dignity. Roach offers several examples of this in Chapter 2, where bereaved family members must contend with the possibility that their loved one's remains will be yanked from the ground. Dealing with human remains requires experimenters to perform a kind of balancing act between compassion and emotional distance. This requires the explicit training also referred to in Chapter 2.

Theresa

Theresa prepares severed heads for the facial anatomy and facelift refresher course.

Yvonne

Yvonne saws off cadaver heads for the facial anatomy and facelift refresher course.

Marilena Marignani

Marliena Marignani is a surgeon attending the facial anatomy and facelift refresher course. She describes her experience working with cadavers.

Ron Wade

Ron Wade is a Baltimore physician who does not believe that live surgery is the place for surgeons to practice new skills. He created a procedure to facilitate surgeon access to donor cadavers.

Hugh Patterson

Hugh Patterson is the man who runs the willed body program of UC San Francisco's Medical School.

Sir Astley Cooper

Sir Astley Cooper was an 18th century surgeon-anatomist and outspoken defender of human dissection. Although he denounced body snatchers, Cooper made frequent use of their services.

Robert Knox

Robert Knox is 19th century Edinburgh anatomist who bought freshly slain corpses from the murderers Hare and Burke.

Dennis Shanahan

Dennis Shanahan is an injury analyst. He is occasionally called upon to investigate air disasters including the TWA Flight 800 incident.

Pierre Barbet

Dr. Pierre Barbet is the man who was asked by the Catholic Church to prove the scientific efficacy of the Shroud of Turn as the burial cloth of Jesus Christ.

Joseph Ignace Guillotin

Joseph Ignace Guillotin is the man after whom the Guillotine was named. He initially supported the Guillotine as a humane form of execution, but later withdrew his support when he began to suspect that a severed human head remained conscious for several seconds after decapitation.

Jack Kervorkian

Dr. Jack Kervorkian was the first American physician to transfuse blood from a cadaver into a living human subject.

Wiigh-Masak

Wiigh-Masak is the founder of Promessa, a Swedish business offering a technologically enhanced form of organic human composting.

The Slime

Also known as "the man in the gray suit," The Slime is the corporate representative of Fonus, Scandinavia's largest mortuary corporation. He crashes the ecological funeral seminar hosted by Wiigh-Masak.

Objects/Places

University of California, San Francisco

The author frequently mentions the University of California, San Francisco and in particular its medical center as a facility that uses cadavers in medical training.

Gross Anatomy Lab

The gross anatomy lab is where young premedical students learn human anatomy by dissecting human cadavers.

Intaglio Nameplate

Created by Sir Astley Cooper these bone nameplates were given as gag gifts to friends. Their method of creation involved painting the friend's name on a piece of bone, force feeding this bone to a dog, and then later retrieving the bone via dissection.

The Cadaver of Mary Patterson

The 19th century anatomist, Robert Knox, preserved the cadaver of the prostitute Mary Patterson in a clear glass vat of alcohol.

University of Tennessee Medical Center

The University of Tennessee Medical Center plays host to the only field study of human decomposition in the world.

Eye Cap

An eye cap is a small object placed under the eyelid of a corpse, intended to hold the eyelid down.

Aspirator

An aspirator is a medical suction device used for removing fluids from a cadaver.

Mr. Blank

Mr. Blank is what Roach calls the cadaver of the 75-year-old male which she sees embalmed.

UM 006

UM 006 is the designation for a cadaver at Wayne State University used in side-impact car crash research.

Linear Impactor

A linear impactor is a device used in crash research to simulate a collision.

H

The female corpse known as "H" is a beating heart cadaver. Although most of the body is yet functional, it is brain dead.

Digestor

The digestor is a machine which uses water, heat, pressure, and lye to break down organic tissue.

Memorial Tree

A memorial tree is a tree fertilized by the human remains of the person it memorializes.

Cornstarch Box

Since eco-funerals require that human remains be laid to rest in a biodegradable container, they use a cornstarch box.

Medical Skeleton

A medical skeleton is a human skeleton, real or artificial, used to teach anatomy in medical schools.

Themes

Death

Death is inevitable. A cadaver or "stiff" represents death or the eventual fate of all humankind. The idea is so fundamental to the human experience that it necessarily invokes a personal response in the reader. Implicit in every passage is the realization that every human being will eventually be "it" or the cadaver, the decaying remains of what once was a human being. This experience is something that reader brings to the text before the book is opened.

Roach addresses the two ways that human beings traditionally struggle with the death of a loved one. These methods are funerals and preservation. Funerals, the author demonstrates, can amount to expensive pageantry and potentially even discourage the bereaved from mourning in the manner of their own choosing. Coffins cannot prevent the eventual decay of organic tissue nor can embalming. Regardless of what the living do on the cadaver's behalf, the outcome is more or less the same.

As Roach sees it, the dead are beyond caring. Only the living can feel pain, fear, and loss. To this end, the author seeks ways that death might serve to improve lives. Donating one's body to science, as Roach repeatedly demonstrates, helps produce life-changing technology, such as safer cars. Donating organs can save lives. Even funerals, Roach demonstrates, can be undertaken more responsibly and with less hardship. They do not need to be expensive or environmentally unsound. Death may be inevitable but human beings have some control over it what it ultimately means.

Dignity

While it is true that a human, like any animal, is composed of blood, tissue, and bone, there also exists a strong human imperative to dignify human remains. A cadaver is due respect by virtue of having been human. Roach does not disagree, but instead asks the question, "What does it mean to treat the dead with dignity?" While certain behaviors are obviously undignified, such as cannibalism or corpse snatching, others are less clearly defined. Is it undignified to raid a brain-dead corpse for its still functioning organs?

Roach demonstrates that there are two opposing forces at work. These are the need to dignify human remains versus the equally human compulsion to insulate oneself against the horror of death. The author speaks to several scientists who protect themselves by objectifying cadavers. They prefer to see them as parts or as tissue, rather than regard them as the husk of a fellow human being. This emotional distance allows the scientist to work with the cadaver in a way that will further science and potentially benefit the living.

Roach sees the kind of dignity that comes with purpose. She respects the man who was UM 006 for the generous contribution of his body to scientific research. Due to UM 006 and the contributions of other such cadavers, cars are safer than they might otherwise have been. Roach is similarly awed by the generosity of H, who in life willed her organs to be donated in the event of brain death. The author sees that H's death has purpose by saving the lives of other human beings. The most dignified way to die, Roach seems to suggest, is by putting your remains to good use.

Intactness

Roach imagines herself winding up as an anatomy skeleton, even fantasizing that she might return from the afterlife to look upon her articulated skeletal remains. She is discouraged however when she learns that it is not an option. No one in the U.S. still creates anatomical skeletons. Roach is similarly taken by the idea of donating her brain to the Harvard brain bank, but is again discouraged the fact that her brain will likely be dissected rather than displayed as a "brain in a jar."

Roach confesses that her desire for a post-mortem intact body is born of pride. She wants to maintain some semblance of her identity beyond death. Roach also suggests, however, that elaborate post-mortem plans for one's remains stem from an inability to accept one's absence from the world. In other words, it stems from a fear of oblivion. There is a real sense that if one can at least remain whole, then some small piece of the individual might survive.

The opposite also seems to be true. If a cadaver is cut into its component parts, it is easier to objectify the body and see it as organs and tissue. This is a blessing for injury analysts like Dennis Shanahan. If the bodies have "come apart," then Shanahan need only contend with gore. If the remains are intact however, Shanahan must instead look upon "shattered lives." If a body has arms, legs, hands, and a face, then it is haunted by the specter of a former living human being. If it does not, then it is easier to regard as meat. With this in mind, it is easy to understand why families are often intent on preserving their loved ones. Maintaining an intact body affords the dead a lingering humanness.

Style

Perspective

Stiff is written in both the first and third person, as well as both the past and present tense. When writing in the first person, Roach appears as a character. When writing this way, Roach uses the present tense almost exclusively. This lends the text both intimacy and immediacy. In these sections, the author is very "present" and the text reads as a traditional narrative, with the author telling the story of where she went, what she saw there, and to whom she spoke.

When speaking of historical matters, the author shifts to third person and employs the past tense. The tone becomes less intimate and more objective. Here the author is concerned firstly with communicating information. When facts are thin or incomplete, or when something particularly distasteful arises, Roach does not hesitate to add opinion and commentary. When this happens, the contrast is stark and often humorous. There is no mistaking Roach's commentary upon the informational content that she critiques.

Roach is a rationalist, holding beliefs both secular and humanist. She is highly critical of Pierra Barbet's attempt propagandize science on behalf of the Catholic Church, also avowing that she knows "no higher office" than the alleviation of pain. This suggests that Roach's beliefs are temporal, rather than spiritual in nature. Roach also has a humorous and sometimes bawdy side that serves to lighten what would otherwise be a very heavy topic. All of these characteristics inflect her work.

Tone

The dominant tone is undeniably humanist. In addressing the topic of death, Roach focuses on human dignity and quality of life issues. Even while addressing spiritual matters, Roach tends to return to the biological, the rational, and the scientific. Despite her humanist preconceptions, however, the author strikes a fairly balanced tone, only occasionally expressing value judgments. Her attitude toward religion, apparent in the way she characterizes Pierra Barbet's research as "propaganda," is best described as wary but is not otherwise adversarial.

Stiff reads in a part-informative and part-social commentary format. The tone is often conversational, with Roach telling the story of the places she visits and the people to whom she has spoken. Even when the author imparts facts or refers to historical events, however, the text never dries out to the level of a textbook. Roach's voice is persistent throughout, adding wit and humor to what might otherwise be a heavy topic. This results in a friendlier read, but also serves to make the text seem less authoritative

Considering the subject matter, there are places in which the tone can turn dark or morbid. Roach does not shy away from graphic descriptions of exposed or rotting tissue. Sensitive readers might also be taken aback by Roach's seeming irreverence in

the face of mortality. She is also quite comfortable venturing off the subject into other taboo areas of social discourse such as sex or cannibalism. However, there never is a sense that Roach's inquiries are merely gratuitous.

Structure

Stiff is broken up into twelve chapters of roughly equal length. Each section has its own pithy and invocative title (e.g. A Head is a Terrible Thing to Waste) that hints as to the content of that chapter, as well as a subtitle (e.g. Practicing surgery on the dead) that provides more specific information about the chapter. These titles and subtitles lend focus to the discussion, not only informing the reader of content, but also committing Roach to a topic, making it obvious when the author has wandered far afield.

Roach's writing tends to go through several transitions over the course of a chapter. She may, for example, begin by introducing an anecdote only to then digress to a matter of historical interest. Roach may even interrupt one anecdote with another, assuming that the second has some relevance to the first. She may be distracted by tangents, parallels, and curiosities. It may not be until the end of the chapter that Roach returns to the point that she was making in the opening, thus creating a kind of anecdotal framework for the entire section. Despite these convolutions, her writing is easy to follow.

Stiff's content spans time and place. Roach herself visits several universities across the United States, where she speaks to a variety of scientists and professionals. The author's historical accounts stretch all the way back to the dawn of time, visiting ancient Rome, Greece and Egypt. Read as narrative, Stiff can seem temporally disjointed. One moment the focus is on 17th century London, while the next moment Roach discusses the Chinese Ming Dynasty. Roach is less concerned with the advancement of time than she is with the advancement of science and civilization.

Quotes

"The early surgeons weren't the hypereducated cowboy-saviors that they are today" (Chapter 1, pg. 28.)

"I want you to know that you are always there when I see patients. When I palpate an abdomen, yours are the organs I imagine. When I listen to a heart, I recall holding your heart" (Chapter 2, pg. 38.)

"This woman lies in a mud of her own making" (Chapter 3, pg. 68.)

"It's difficult to put into words the smell of decomposing human. It is dense and cloying, sweet but not flower sweet" (Chapter 3, pg. 70.)

"There is one thing that dead people excel at. They're very good at handling pain" (Chapter 4, pg. 88.)

"'People very close to an explosion come apart,' said Shanahan" (Chapter 5, pg. 117.)

"We're not talking about research that will help mankind save lives; we're talking about research that will help man take lives" (Chapter 6, pg. 142.)

"To my mind there is no 'greater office' than that of 'alleviating the pain of our brothers.'—certainly not the office of religious propaganda" (Chapter 7, pg. 164.)

"Since brain death is the legal definition of death in this country, H the person is certifiably dead" (Chapter 8, pg. 168.)

"If you really wanted to know for sure that the human soul resides in the brain, you could cut off a man's head and ask it" (Chapter 9, pg. 199.)

"There was for a time a trade in fake mummies being sold by Jews in Alexandria" (Chapter 10, pg. 223.)

"In a Swedish newspaper poll taken last year, 40 percent of respondents said they'd like to be freeze-dried and used to grow a plant" (Chapter 11, pg. 274.)

"The line between solid waste disposal and funerary rituals must be well maintained" (Chapter 11, pg. 275.)

"It makes little sense to try to control what happens to your remains when you are no longer around to reap the joys or benefits of that control" (Chapter 12, pg. 290.)

Topics for Discussion

What are the potential benefits and drawbacks of surgeons using cadavers to practice new surgical techniques?

It is said that the living should treat the dead with dignity. What does this mean? What sort of behaviors are dignified? What sort of behaviors are not dignified?

If nothing can stop the decay of organic tissue, what is the point of burying the dead in a coffin or embalming the corpse?

What would the world be like if cadavers had never been used in automotive impact research?

Why do professional report that it is emotionally more difficult to see an intact corpse than it is to see one that has "come apart?"

Why is American culture opposed to research that involves blowing up of cadavers?

What aspect of Pierra Barbet's research did the author take issue with. Do you agree? Why or why not?