

CHAPTER 1

Dialogue with the Dead

“You can take him to the mortuary now.”

—Sherlock Holmes in *A Study in Scarlet*

LONDON IN 1887. Cobblestones and narrow, twisting streets. Hansom cabs driven on urgent errands, rumbling past public houses bursting with noise and smoke. Bearded men wearing capes, carrying walking sticks with silver heads. Vast museums holding jumbled curiosities, visited by veiled ladies draped in furs and discreetly scented with lavender—ladies whose rigid carriage somehow implies they expect to be embraced rarely and reverently by their husbands but firmly and constantly by their corsets.

Street women florid with gin. Homeless and diseased, laden with every garment they own, agitated by lice, they move heavily, heading to the public house, the doss-house, the workhouse, the river . . .

And the river is the slow-moving Thames. It penetrates the city, its water brown in response to the strong current stirring the bottom mud, its flow the only power carrying flatboats that

convey the desperately needed black coal. The banks of the river swarm with mudlarks, young boys who scavenge for anything salvageable—wood, coal, coins—their reward often cholera from the raw sewage that churns through the great river.

The city teems with street vendors, drivers, horses, pickpockets, chimney sweeps, and nursemaids, the exalted and the wretched. It is home to the elegant parks and to the noisome slaughterhouses, to the tenements and to the majestic houses, all of them wrapped in swaths of thick fog and illuminated by gaslight.

It is home as well to the great hospitals, St. Mary's, Guy's, St. Bart's, and their lecture halls and laboratories, where sometimes macabre research is undertaken, hidden from public view by drawn blinds. In the first Sherlock Holmes story, the novel *A Study in Scarlet*, we are taken behind those blinds and watch as Stamford, an old acquaintance of Watson, leads him toward the laboratory where the most famous friendship in detective fiction will soon be forged:

[W]e turned down a narrow lane and passed through a small side-door, which opened into a wing of the great hospital. It was familiar ground to me, and I needed no guiding as we ascended the bleak stone staircase and made our way down the long corridor with its vista of white-washed wall and dun-colored doors. Near the farther end a low arched passage branched away from it and led to the chemical laboratory.

This was a lofty chamber, lined and littered with countless bottles. Broad, low tables were scattered about, which bristled with retorts, test-tubes, and little Bunsen lamps, with their blue flickering flames. There was only one student in the room, who was bending over a distant table absorbed in his work.

Stamford has already warned Watson of his future roommate's many eccentricities, which include Holmes's beating of dissecting

room cadavers with sticks in order to study postmortem bruising and his frequent dabbling in poison:

“Holmes is a little too scientific for my tastes [Stamford tells Watson]—it approaches to cold-bloodedness. I could imagine his giving a friend a little pinch of the latest vegetable alkaloid, not out of malevolence, you understand, but simply out of a spirit of inquiry in order to have an accurate idea of the effects.”

And Holmes, when they finally meet, doesn't disappoint in this respect:

“Dr. Watson, Mr. Sherlock Holmes,” said Stamford, introducing us.

“How are you?” he said cordially, gripping my hand with a strength for which I should hardly have given him credit. “You have been in Afghanistan, I perceive.”

“How on earth did you know that?” I asked in astonishment.

“Never mind,” said he, chuckling to himself. “The question now is about hæmoglobin.”

Watson is a medical man, comfortable with dissecting rooms and their pungent odors. He is also well traveled and well read, and he is probably familiar with the enormous advances that were being made in the new world of forensic medicine, many the result of experiments done on corpses, so he finds Holmes's interests congenial. They are thus well matched to share a series of adventures in a Victorian world that becomes their laboratory for applying science to criminal investigation.

In 1887, forensic science was largely a function of the medical profession and was most frequently referred to as “Medical Jurisprudence” or “Legal Medicine.” An accurate understanding of fingerprint and trace evidence was still in the future, but a few

adventurous physicians versed in anatomy, pharmacy, and microscopy were beginning to use their skills in the study of unexplained sudden death.

At first, this new field grew most vigorously on the European continent. Across the channel from England, there had been an old, if not entirely respectable, tradition of anatomical exploration, and in past centuries innovative artist-anatomists such as Andreas Vesalius and Leonardo had been known to liberate bodies from the dead houses and the gallows to study and draw them. Vesalius had to answer to the Inquisition, and Leonardo could not publish his anatomical studies within his lifetime. But gradually, the established Church withdrew its opposition to dissection, and more students were drawn to the subject.

At the beginning of the eighteenth century, the great Italian physician Giovanni Battista Morgagni began to change the focus of anatomical dissection, not only searching for an understanding of the structure of the human body, but also trying to match the changes in the cadaver to the clinical symptoms of disease reported before death. From there it was a short step to the idea of dissecting bodies to look for changes caused by criminal acts.

By 1794, the famous Scottish anatomist and surgeon John Bell was insisting on the primacy of dissection in the study of medicine and anatomy, writing in his *Engravings Explaining the Anatomy of the Bones, Muscles, and Joints*, "Anatomy is to be learnt only by dissection. Dissection is the first and last business of the student." Bell's engravings of dissection are extraordinary, both detailed and instructive, but they gave no guidance on obtaining subjects.

In nineteenth-century France and Germany, subjects for dissection were easily available for research, as unexplained deaths were automatically referred to the police for examination. Working conditions were forbidding, the mortuaries being poorly ventilated, malodorous, and churning with infectious matter. The scent of the charnel house clung to doctors' clothes, to their hair, to their skin. There was inevitably a certain social disdain for their specialty.

In spite of these impediments, the work was fascinating, and in Paris, two physicians, Paul Brouardel and Ambrose Tardieu, were busily studying the signs of suffocation and hanging on cadavers. Tardieu published a paper titled “La Pendaïson, la strangulation, et la suffocation,” in which he described the tiny spots of blood that may be found at the heart and under the pleura in the corpses of people who have been quickly suffocated; these spots are still known today as “Tardieu spots.” In 1897, Brouardel’s book, *La Pendaïson, la strangulation, la suffocation, la submersion*, described the marks left on the neck by hanging and the damage to the hyoid bone caused by manual strangulation.

In Lyon, Dr. Alexandre Lacassagne’s detailed examination of the dead resulted in a new understanding of the physical changes that take place with the end of life. He made notes on rigor mortis, the way in which the muscles stiffen, becoming first evident in the jaw a few hours after death, then spreading downward, and finally retreating in the same order in which it appears.

He described livor mortis, the discoloration of death, which occurs as the circulation ceases, allowing the blood to settle. He observed algor mortis, the cooling of the body, and the rate at which it reaches the temperature of its surroundings.

Lacassagne saw all these as useful tools in estimating the time of death. But he also noted many possible exceptions. The temperature of the surroundings, the circumstances of death, the age and physical condition of the deceased—all could affect the appearance of these signs. He warned against too-rapid conclusions and impressed upon his students his dictum: “One must learn to doubt.” And the pathologist Charles Meymott Tidy concurred, saying, “There is a scientific certainty which only the coward treats as uncertainty, and there is an uncertainty which only the boldness of ignorance ignores.”

In the fervor of discovery, new methods of dissection were evolving and were the subjects of much controversy. In Vienna, Karl Rokitsky, who obtained his subjects from hospital deaths and autopsied two cadavers a day, every day, for forty-five years,

taught his students a postmortem technique he had developed. The internal organs were exposed and then dissected and examined in situ (in place; that is, in the body).

This technique was modified by Gohn, who introduced the method of removing the organs in blocks related to their function. A version of this technique is most often seen today in medical school dissections.

Maurice Letulle favored the *en masse* version, in which the contents of the chest and abdominal cavities were removed as a whole. Rudolf Virchow, working in Berlin, advocated his own method, in which the organs were removed and examined separately. It is this technique that is most often used in forensic autopsies at the present time. This more delicate procedure is preferred by many pathologists, as they feel it is less likely to lose small traces of medical evidence.

New discoveries simmered on the continent, but in the British Isles things were very different. The English had always relied on a system in which suspect deaths were referred to the Coroner, or Crowner, a political official who was not required to have any scientific or medical training. He might, if he thought a case warranted it, obtain an opinion from a physician, but that physician was not necessarily skilled in forensic work. Until the late nineteenth century, there was not even a registry for deaths, and many cases that cried out for investigation were simply left in the hands of next of kin.

The treatment of human remains had long been a sensitive issue in England. A mixture of religious practices, superstition, and emotional regard for the deceased made the thought of allowing the dissection of human beings abhorrent.

Historically, dissection had been performed in England either to explore anatomy or to humiliate the subject of the procedure. It was seen as a disgrace. For centuries, the bodies of executed criminals had been left in the hands of the executioners, who displayed the decaying corpses on gibbets and sometimes eviscerated them before attentive crowds as an added punishment.

Scotland pioneered in the study of surgery, but the medical schools there labored under the burden of finding adequate subjects. Under English law, a few bodies of the executed were given to the surgeons as teaching material each year. There were never enough. The needs of medical schools were filled by bodies illicitly obtained from recent burials.

The wealthy dead were offered some degree of protection by armed guards provided by their relatives. Iron grids known as “mort safes” were laid at large expense on new graves as an additional precaution. Elaborate arrangements of flowers and pebbles were used on burial plots to make it harder for grave robbers to do their work unnoticed. But often the skills of the “sack ’em up men” prevailed. The corpses of the poor, whose relatives could ill afford such precautions, were at even greater risk. Public opinion was further enraged by the ghastly crimes of Burke and Hare, the depraved, if enterprising, entrepreneurs who murdered sixteen people and sold the corpses to surgeons, thus avoiding the labor of disinterment.

The English public was deeply ambivalent, and similar sentiments were prevalent in America. On the one hand, if an internal organ urgently needed treatment, it was reassuring if the surgeon had an accurate idea of where it might be located. On the other hand, no one wanted the remains of their dear ones to provide the example.

There was great resentment over the surgeons’ business dealings with grave robbers, and since forensic autopsies and dissections were similar, there was little public support for forensic medicine. This began to change in the mid-nineteenth century when Alfred Swaine Taylor, a young British pathologist who had trained in Paris, was appointed to teach forensic medicine in London. He brought with him a new perspective on examining violent death and presented his ideas in a carefully reasoned text full of detailed examples. Taylor’s seminal work on pathology and toxicology, the first in the English language, had enormous influence on criminal investigation in the days of Holmes and Watson.

Consider Watson's vivid description, in *A Study in Scarlet*, of Holmes examining not only the corpse but everything at the crime scene: "[H]is nimble fingers were flying here, there, and everywhere, feeling, pressing, unbuttoning, examining." It is clearly an echo of Taylor's exhortation in the 1873 edition of *A Manual of Medical Jurisprudence*:

The first duty of a medical jurist is to cultivate a faculty of minute observation. . . .

A medical man, when he sees a dead body, should notice everything. He should observe everything which could throw a light on the production of wounds or other injuries found upon it. It should not be left to a policeman to say whether there were any marks of blood on the dress or on the hands of the deceased, or on the furniture of the room. The dress of the deceased as well as the body should always be closely examined on the spot by the medical man.

There being no forensic medical specialist at the scene, Holmes simply fills the role himself. He does depart from Taylor's precepts in accepting Lestrade's opinion that there is no wound on the body, but then, Holmes follows no man slavishly. He takes what he likes from the new science and improvises the rest.

In "The Resident Patient," we see Dr. Watson dabbling in forensic medicine by giving an opinion on time of death based on the amount of rigor established in a hanged man. True, he doesn't consider possible variables, but he is aware of the concept.

Many of the texts on medical jurisprudence were an odd mixture of fact and myth, and perhaps Watson relies too heavily on them. In *A Study in Scarlet*, he offers this description of a corpse: "On his rigid face there stood an expression of horror, and as it seemed to me, of hatred, such as I have never seen upon human features." Except in the very rare case of cadaveric spasm, or instant rigor, the muscles, including those of the face, relax at the

moment of death. What were sometimes interpreted as expressions of horror or fear were the result of physical change or injury caused by a weapon, a caustic substance, or an animal or insect, or the discoloration caused by suffocation, lividity, or the onset of decay. Many doctors saw and observed, but they did not yet fully understand.

And what of the dissecting rooms themselves, in which we are told Holmes spent so much time? What mysteries did they hold?

Bodies used for dissection were usually drained of blood and injected with preservatives so that the specimens could be reused. Holmes notes this in “The Cardboard Box” when he dismisses the theory that the severed ears sent to an elderly lady are relics of a dissecting room. He also makes the point that the ears are packed in salt—not something, he believes, that would occur to a medical student. (The mention of severed ears must have sent a shiver through Londoners when the story was published in 1893, resonating as it did with a letter sent to authorities during a string of sadistic murders a few years before. That note had threatened, “Next job I do I’ll clip the lady’s ear off and send it to the police officers just for jolly.” It had been signed “Jack the Ripper.”)

Between anatomy demonstrations, the bodies were stored in cadaver boxes—chambers in which they were hung from hooks. The corpses were carted back and forth as needed by *dieners* (mortuary assistants).

The tables used for dissection were flat and had neither drains nor rims, so fluids ran onto the floor, which was usually covered with sawdust so that it could be easily swept clean. Natural light was preferred, as the interior lighting available—oil lamps, candles, and gaslight—distorted color. In the interest of evading the prying eyes of the public, hospitals were often built around interior courtyards, and dissecting rooms faced the courtyards rather than the street. Windows were sometimes coated with soap or tal-low to provide privacy.

Occasionally there were hiding places adjacent to dissecting rooms in case a doubtfully acquired cadaver needed concealment

from overly enthusiastic investigators. Large fireplaces often served this purpose. A questioned body would be lifted by a hoist into the chimney and a fire lit below. It's true the corpse would smoke slightly, but it would still be perfectly serviceable when retrieved. This technique was particularly popular in New England. When not so warmed, the rooms were cold and reeked of preservatives. In the more progressive places, carbolic acid was added to the stench.

The demonstrators in anatomy and their students wore hats and aprons but otherwise had no protective gear and worked with bare hands.

The first step in the dissection was to remove identifying characteristics from the subject to make sure no frantic relative who had noticed an empty grave could claim ownership of the corpse. Clothing, if any, was discarded. The law defined purloining corpses as a misdemeanor, but stealing clothes was a felony, for which there was a severe penalty.

Usually the subjects—particularly if they were stolen—arrived naked, in sacks or barrels. If they had been brought from a distance, they were packed in alcohol and often discreetly labeled as “pork” or “beef.” The corpses of children were referred to as “small.”

The body was arranged on its back, its head raised on a block of wood to make the neck easily accessible. The initial incision was made from the chin down, over the throat, across the chest, around the navel, to the pubis. Sometimes the bodies were propped up by ropes to demonstrate the way the limbs extended in life.

Without the powerful electric rotating saws of the present day, dissection was physically arduous. The skull was opened with knife, saw, and chisel. The various organs, muscles, arteries, and veins were removed, inspected, and studied as systems. Drawings and notes were made, and those parts still usable were replaced in the body, which was then sewn up by the *diener* and returned to the cadaver box.

The system of the medicolegal autopsy evolved from dissection but had several important differences. In a suspicious death, the victim's identifying traits were carefully noted and retained by drawing or photography. The clothing was not stripped and discarded but examined and kept for evidence. Preservatives or any chemicals that might confuse the pathologist's sense of smell were discouraged. (Many anatomists, willing to sacrifice olfactory information, smoked prodigiously during autopsies, claiming it was for reasons of hygiene.)

The body was opened with the classic incision from chin to pubis but only after careful external examination. Wounds and their direction and depth were recorded. Since blood was not drained and replaced with chemicals, it oozed and dripped, carrying with it the threat of disease. Unexpected broken bits of bone could injure the most careful investigator, who had to work with bare hands thrust deep inside gaping incisions.

The mortuaries stank of decay, of fecal matter and vomitus. They boiled with danger, but physicians and *dieners* did their work with the same determination as the dissectors. As swarms of flies bore buzzing witness, they coaxed the last sad secrets from the murdered dead.

The anatomist, in demonstrating a dissection, had asked his subject, "How are you made?" The pathologist now asked the corpse on his autopsy table, "How did you die?" The answers were not always clear. It seemed sometimes that for every two steps forward, there was one taken backward, and that forensic medicine, if poorly applied, could be the cause of dangerous mistakes.

In the seventeenth century, a doctor in Czechoslovakia named Johann Schreyer devised a test he believed would prove whether a child had been born alive. Basing his test on earlier work by the Danish physician Caspar Bartholin, who wrote that air present in the lungs of a dead infant indicated a live birth, Schreyer threw the lungs of allegedly stillborn infants into basins of water. If they floated, Schreyer said, this would prove the child had been born alive.

For many years, this was the standard test. Many distraught mothers were accused of infanticide on the strength of it before it was observed that putrefaction in the lung tissue could also cause the lungs to float. Schreyer's procedure underwent a number of adjustments over the next two hundred years before it became truly useful, and even then it was considered only an indication, not absolute proof, of live birth.

The new science was slowly emerging from a mass of myth and misunderstood observations. It had been demonstrated repeatedly that the hair and nails do not continue to grow after death but that they appear to do so due to the contraction of the skin and underlying muscles. As recently as 1882, however, a pathology text by Charles Meymott Tidy reported, erroneously, that both hair and nails increase in length after death.

Dr. Tidy happily recounted that knowledge of this "fact" had protected a group of medical students from conviction in a body-stealing case. The relatives of a recently deceased retarded boy had discovered his grave empty. They identified a dissected corpse at the anatomy school as the child's by its extraordinarily long fingernails. At trial, a medical "expert" explained that the nails, which were so long that they curved around the tips of the fingers and toes and extended along the palms of the hands and the soles of the feet, had grown that way postmortem. The charges were dismissed, and the medical students were free to continue digging for knowledge.

In the same year that Tidy published his text, a complex forensic case was causing intense sensation in Central Europe. In the small Hungarian village of Tisza-Eszlar, a fourteen-year-old Catholic domestic servant named Esther Solymossy disappeared while on an errand for her mistress. It was early spring, the season of Easter and Passover, and it was not long before the ancient and terrible folk belief in Jewish ritual murder was resurrected in the town. Jews, it was whispered, killed Christian children to obtain their blood with which to make Passover matzos. Obviously, the Jews had stolen Esther for this ghastly purpose.

Several Jewish children were taken into custody for questioning. Threatened and beaten, one “confessed” that he had seen Esther taken captive in the synagogue by some of the Jewish elders, and, through a keyhole, had witnessed her throat being cut and her blood being caught in a pot. But the child was unable to say where Esther’s remains were hidden.

A number of Jews were arrested, although there was no objective evidence against them. They were interrogated and tortured until several of them signed confessions. But they made no statement as to the location of the corpse. Extensive searches for the remains were fruitless. As summer approached, the medieval serpent of anti-Semitism uncoiled further, and violence against the Jewish community raged through the town. Jews were beaten, and their property was ransacked, burned, and stolen. And still no sign of Esther.

But then, in the nearby town of Tisda-Dada, the body of a young woman was recovered from the river. The corpse was wearing a dress similar to the one Esther was wearing when she vanished. The length of the body was consistent with that of the missing girl. No other woman had been reported missing in the area. Several of the townspeople insisted that this was indeed the body of Esther Solymossy.

But the throat of the woman from the river was untouched. And the body was intact. Esther had been missing for months. Surely, if she had been in the river so long, decay would have made its ugly inroads. Esther’s mother viewed the corpse and furiously denied that it was her daughter.

Three medical men, entirely unburdened by any training or experience in forensic pathology, were given the job of determining the identity of the girl from the river and the cause of her death. They contemplated a very pale female body, with soft, unstained nails on both hands and feet. The genitalia were expansively swollen. The intestines and internal organs were well preserved. The body seemed devoid of blood.

Based on these observations, the doctors solemnly reported

their conclusions: The dead girl was at least eighteen years old and possibly a bit older. She was of privileged background. Although she was unused to physical labor, the enlarged genitals indicated that she was very accustomed to sexual intercourse. The cause of death was anemia. She could not have been dead more than ten days. In short, this was clearly not the body of Esther Solymossy, who had been fourteen, and who habitually walked barefoot and was tanned from walking bareheaded in the sun.

This was a great relief to the town fathers. They reasoned that since the body in question was determined not to be that of Esther, there was no reason to examine the discrepancies between the corpse and the confessions, and therefore the pillaging and destruction of Jewish property could be allowed to proceed in traditional fashion. The accused Jewish elders remained in prison, and the pathetic remains of the girl from the river were buried.

But the case caught the attention of journalists and became the subject of intense argument throughout Europe. A group of lawyers from Budapest, well educated and knowledgeable about the new world of forensic pathology and skeptical of the concept of blood as an ingredient in matzo, offered to appear for the defense. They demanded that the body be exhumed so that it might be examined by three doctors experienced in legal medicine. This met resistance by Bary, the examining magistrate, who was a great believer in the myth of ritual murder. The state prosecutor, however, supported the idea, as he was uneasy with the sparse evidence and nursed an interest in justice.

In the icy cold of December, the river body was removed from its resting place, and Professors Johannes Belki, Schenthauer, and Michalkovics of Budapest performed a second autopsy. Their findings differed strikingly from those of the local doctors.

The experienced Budapest group insisted the body was that of a female not more than fifteen, as shown by the immaturity of her bones. Her swollen genitalia resulted from long immersion in water rather than from sexual relations, and her extreme whiteness was due to the outer skin having been stripped off by the

water, leaving only the pale corium, the inner layer of skin, through which the blood had oozed.

The unusually clean fingernails and toenails, they pointed out, were not the nails at all but the nail beds, the outer portions having been pulled off by the river current. Further, since the intense cold of the water had kept the body from decay, it was quite possible that she had been in her gelid grave for three months. The clothes on the corpse and the other physical details were a match for those of the missing girl. The professors from Budapest concluded that this was indeed the body of Esther Solymossy and that the undamaged throat made it clear that the “confessions” were invented. Thus exonerated, the accused Jews were freed to take up the burden of their lives.

The new technique of forensic autopsy had commanded justice. It was a beginning. There would be many twists in the path—superstitions and prejudices to overcome, scientific truths yet to be discovered. But the use of autopsy in the pursuit of justice had been established. The idea that a murder victim must be meticulously examined in the context of the crime, that science had an essential part to play in the legal system, was becoming accepted.

It was the first great building block of the science of Sherlock Holmes.



WHATEVER REMAINS

“How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?”

—Sherlock Holmes in *The Sign of Four*

- Physicians who acquired infections from subjects they autopsied could transmit disease to their living patients. A classic example of this occurred in 1847, when the Hungarian physician Ignaz Semmelweis became greatly distressed

by the high rate of puerperal fever and maternal death in the Viennese hospital in which he worked. Observing that women delivered by doctors were much more commonly infected than those attended only by midwives, Semmelweis began to suspect that the physicians were inadvertently carrying disease to their patients. His suspicion became conviction when his mentor, Dr. Jacobus Kolletscha, acquired a fatal infection similar to puerperal fever after receiving a minor cut during an autopsy. Semmelweis then insisted that physicians scrub with chloride of lime before examining the living, and the death rate fell dramatically. Many of the doctors, feeling pricked in their amour propre, never forgave him. Semmelweis died in an insane asylum.

- Autopsies were made much less physically strenuous by the development of the oscillating surgical saw. It was first patented by Dr. Homer Stryker, an orthopedist, in 1947, and so is commonly referred to in autopsy suites as the “Stryker saw.”
- It is not only disease that threatens the forensic pathologist and his team. Shooting deaths caused by explosive bullets are a hazard for the unwary mortuary worker. When such projectiles have failed to explode in the victim, they may do so during the postmortem, and they must be handled with long-handled instruments and great care.
- The term *diener* comes from the German and literally means servant. The term “mortuary assistant” is preferred today, *diener* being seen as patronizing. However, seen in the context of “servant to anatomical science,” it seems both more acceptable and is more accurate historically. In many medical examiners’ offices, the assistants are highly trained—skilled, if unsung—anatomists. They are often former army medics.