

Book 1

Civil and Topographical Engineering

I

April 4, 1868

Its proud lines intermittently visible through the early morning fog, the Light of the East might have been the most carefree ship that ever floated into Boston. Some of the sailors, their bearded faces browned and peeling from too much sun, cracked the last rations of walnuts in their fists or under their boot heels, singing some ancient song about a girl left behind. After wild March winds, stormy seas, dangerous ports, backbreaking work, and all the extremes of experience, they'd be handed a good pay at port, then freed to lose it to the city's myriad pleasures.

The navigator held the prow steady, his eye on his instruments, as they waited for the fog to disperse enough for their signal to be seen by the pilot boat. Although Boston Harbor stretched across seventy-five square miles, its channels had been so narrowed for purposes of defense that two large ships could not safely pass each other without the harbor pilot's assistance.

The Light's austere captain, Mr. Beal, strode the deck, his rare aura of high contentment amplified by the giddiness of his men. Beal could envision in his mind's eye the pilot boat breaking through the fog toward them, the pilot dressed like an undertaker, saluting indifferently and relieving Beal—for once—of his burdens. Then would come the view of

the stretches of docks and piers, the solid granite warehouses never quite large enough for all the foreign cargo brought in by the merchants, then beyond that the State House's gold dome capping the horizon—the glittering cranium of the world's smartest city.

In the last few years, with so many men returned from fighting the rebellion, even modest Boston merchants had become veritable industrialists, beset as they were by excess hands. This city had prided itself on its history from the time it was little more than a quaint village, but Beal was old enough to know how artificial its modern visage was. Hills that formerly sloped through the city had been flattened, their detritus used to fill in various necks and bays, the foundations for streets and new neighborhoods and wharves such as the one that soon would welcome them. He could remember when the Public Garden was plain mud marking Boston's natural boundary.

A steam pipe bellowed from some unseen ship launching on its way or maybe, like them, gliding toward a journey's end, and Beal felt a solemn comradeship with all unknown voyagers. As he glimpsed the crescent moon and thought he would soon have enough light even in this nasty fog to lay course, his pleasant reverie was broken by a bright light flashing low in the water. When the captain craned forward, a lifeboat caught in the current, right in the path of their prow, sprang out from the mist.

His lookout cried out while Beal seized his speaking trumpet and shouted orders to change course. A woman's scream floated up. The schooner veered adroitly in efforts to avoid the small craft, but too late. The lifeboat's passengers jumped for their lives as their boat split into pieces against the Light's prow, the screaming woman thrusting a small child above the waves. To the shock of the captain, another obstacle broke

through the dense curtain of fog on the schooner's starboard side: a pleasure steamer, with its flags flying the signals of distress, and taking on water.

"Clear lower deck!" Beal shouted.

Light of the East had nowhere to go. The side of its hull grazed and then caught the stranded steamship, right through the forward bulkhead: Pipes snapped and scalding-hot steam rushed into the heavy air as the hold of the schooner was ripped open. Now it, too, took on water, fast.

Chaos reigned on and off the ships. Beal snapped an order to throw the cargo overboard and repeated it sharply when his men hesitated. If they didn't unload right now, they would lose not only their profits, but also the ship and likely lives.

"Captain! There!" called his lookout.

Beal stared in astonishment from the railing as a stray breeze parted the fog. The wharf loomed ahead, but it was now clear they were approaching it from the wrong angle, parallel instead of perpendicular. Incredulously, the captain extended his spyglass. A bark flying British colors had wrecked against the tip of one of the piers and caught fire, while another schooner, marked the Gladiator, had drifted against the wharf, where its crew feverishly tried to tow it in. As he watched, fiery debris spread to the Gladiator's sails, which an instant later were wreathed in flames.

At least half a dozen ships were visible in those few moments of clarity, and all were foundering in various states of distress across the once-orderly harbor, reverberating

with shrieking whistles, bells, foghorns, and other desperate signals.

Beal frantically stumbled and slid on his way to the navigational instruments. The needle of the steering compass, held under glass by the wheel, spun around violently, as if bedeviled, while on his pocket compass the needle was 180 degrees off the mark—north was south. He'd sailed by these navigational instruments—finely tuned with the expertise of nineteen centuries—for his entire life as a seaman, and he knew there should be no way for them to fail all at once.

The pleasure steamer they had crashed into suddenly lurched forward with a boom. In seconds it was entirely underwater. Where it had been, a vortex opened, sucking under those already stranded in the water, and then spitting them out high into the air.

“To the lifeboats!” shouted Beal to his thunderstruck crew. “Find anyone alive and get as far away as you can!”

II

Charles

Submerged. As the waves soothed his naked body, his athletic strokes worked in concert with the rhythm of the current. The first week in April had not yet promised any warmth, the water still rather icy. But he willingly endured the chill ripping through his body for the better feeling swimming afforded him. It was a feeling of being alone but not lonely, a sense of freedom from all restrictions and control. Floating, kicking, somersaulting—try as he could to make noise, the water rendered him irrelevant.

Throughout his boyhood in a port town, he'd heard so many people spoken of as "lost at sea." Now it seemed to him the strangest turn of phrase. As long as he was in the water, he could not be lost. He could bask, bathe, disappear, and the water sheltered him as much in Boston as it had back home. Not that he ever felt homesick, as some of the other Institute students did who had come from outside Boston. He still traveled the forty miles back and forth to Newburyport by train every day to keep down living expenses, although it cost him more than an hour each way.

To his mother and stepfather, the Institute remained a strange detour from his good position at the machine shop, and a daily interruption to his help at home. His stepfather, James, had always been unhappy, plagued by a partial deafness in his left ear that made him shun all society and friends. He worked as a night watchman for a jeweler because he preferred the solitude and uneventful nature of the position. He assumed people were speaking ill of him because he could not hear what they said, which led him to the further conclusion that city life, being loud, was an evil cacophony of deceit. As for his mother, she was a religious zealot of the old Puritan kind who saw danger in urban life and no value to the son's studies in Boston.

Even now, when he was a senior, graduation a mere two and a half months away, they did not accept that he—Marcus Mansfield, of all people!—was a student at a college.

Marcus plunged his head back into the cool water, ears tingling as he surveyed the river—a tranquil and forgiving lane that ran between Boston and Cambridge, lined by a gentle, sloping green sward that would shade swimmers and oarsmen from the hot days to come. Unseen behind the thick weather, above the riverbank and the fields and

marshes skirting it, there lurked the crowded brick and iron and gold-domed city, propelling Marcus forward with the powerful thrust of a gigantic engine.

At the shallow bend of the river Marcus took another big breath and sank, closing his eyes and relishing the drop. Down below, pieces of debris and lumber had lodged in the muddy riverbed. As he brushed against the foreign articles, he heard a voice beckon, distant, as though issued from the sky:

“Mansfield! Mansfield! We need you!”

Marcus bobbed up from under the water and then grabbed onto the side of a boat.

“Mansfield! There you are! You’re late.”

“How did you know I was swimming?”

“How did we—? Ha! Because I saw a pile of clothes back there on the shore, and who else would dare plunge into this freezing Styx!” The tall, blond oarsman dangled a suit of clothes above Marcus’s head. “Actually, it was Eddy who recognized your clothes.”

“Morning, Marcus,” said the second, smaller oarsman with his usual open smile.

“And since Eddy and I were both ready,” continued Bob, “we pushed out to find you.”

“Then you were early,” said Marcus, treading water toward the bank, “before I was late.”

“Ha! I’ll take that. Get dressed—we need our third oar.”

He shook himself dry on the bank and climbed into his gray trousers and light shirt. His two companions presented a study in opposites as they helped him into their boat: Bob, with the quintessential New Englander’s clear skin and crown of handsome curls, standing carelessly at the edge of the shell; Edwin Hoyt, slight and frail-looking, throwing the little weight he possessed to the other side in anticipation of a tragic drowning.

Despite knowing the water and boats pretty well, Marcus had not grown up indulging in such impractical pursuits as rowing for pleasure, with its arbitrary rules and catchwords. Some weeks before, Bob had announced one morning, “This is the day, fellows!” to Marcus and Edwin, their fellow Institute of Technology senior, as he bounded ahead of them on the way to a lecture.

“Which day?”

“Spring is here, Mansfield, and since it’s our last one at the college it’s time I showed you rowing just as I promised. Why, I hardly knew one end of the oar from the other until I was nine years old. A scrawny boy I was, the smallest Richards ever!” This served to emphasize what a commanding twenty-two-year-old Bob had become. Marcus could not actually recall Bob promising to teach them, but let that pass, given Bob’s enthusiasm.

To his surprise, Marcus found rowing not to be the wasted time he expected, and it took

his mind away from worrying about the looming future away from the Institute. It was at once calming and exciting, a thrill when the shell launched across the surface of the water as though alive. They tried to recruit more oars among their classmates to join them, but the few willing candidates never did find time.

As their small vessel pushed steadily along, Bob began laughing to himself. "I was just thinking of my brothers," he explained. "They used to warn me about the sea serpent of the Charles. Nearly one hundred feet long, they said, with humps like a camel and a cry like a braying donkey crossed with an elephant's trumpeting. You know how I have to take it upon myself to investigate anything in nature. Well, for three months I searched out old Charley, until I determined that the water wouldn't sustain a sea serpent's diet."

"But how did you know what a sea serpent ate?" Edwin asked seriously.

"Bob, would you mind rowing farther east today?" Marcus proposed.

"A quest! Where to?"

"I haven't seen the harbor since . . ." Marcus did not finish his sentence.

"Better not to, Marcus," Edwin said quickly. "I caught sight of it this morning after it was all over. The whole harbor was up in smoke. It was like looking into the face of a bad omen."

"Eager to see the destruction?"

“Actually, Bob, I was hoping to learn something from seeing how they begin the repairs,” Marcus corrected him. “There is already some debris on the riverbed that must have drifted on the current.” He stopped when he saw Bob’s face narrow as he looked out on the water behind them. “What is it?”

“Just my luck,” Bob said. “Faster, fellows! Go! Come on, Mansfield, faster! Well rowed, Hoyt! All clear, come on!”

A forty-nine-foot shell had shot out of the trees sheltering a narrow adjoining channel with the speed of a lightning bolt. Six flashing oars creased the surface of the river in synchronized strokes, throwing off white streaks behind them. The rowers were bare from the waist up, with crimson handkerchiefs wrapped around their heads, and their flexing muscles glistened in the strengthening sun. As Marcus peered back at them, they looked like highly educable pirates, and he knew it would be a lost cause to attempt to elude whatever this boat was.

“Who are they?” he marveled.

“Blaikie,” Bob explained as the three of them pulled as hard as they could. “His is the best Harvard six there ever was, they say. Will Blaikie—he’s the stroke oar. I’d rather stare into the mouth of the serpent.”

Edwin wheezed between strokes, “Blaikie . . . was . . . at Exeter . . . with Bob and me.”

The other vessel came on with a spurt too powerful to shake, now just a length behind.

“Plymouth!” cried the lantern-jawed lead rower on the lightning bolt. The boat went by theirs and then reversed and ranged alongside of them.

“Why, it is you, Plymouth!” said the stroke oar, Blaikie, to Bob with a gleaming smile. Even seated in his shell, he presented the particular mincing swagger of a Harvard senior. “It’s been ages. You’re not forming a randan team, are you?”

“We’ve been borrowing a shell from the boat club,” said Bob, motioning for his friends to stop rowing. Marcus could not remember seeing his classmate so deflated.

“Don’t tell me you’re still dragging your heels over at that embryo of a college, Plymouth?” Blaikie asked.

“We are seniors now, like you.”

“Tant pis pour vous,” interjected one of the Harvard boys, eliciting chuckles from the others.

“I fear civilizing your classmates into respectable gentlemen will take more than teaching them to grip an oar,” Blaikie went on cheerfully. “Science cannot substitute for culture, old salt. I used to agonize, Plymouth, what I would most rather be, stroke of the Harvard, president of the Christian Brethren, or First Scholar of the class. Now I know what it is to be all three.” He was reminded by one of his oarsmen not to forget president of one of the best college societies. “Yes, Smithy! But it is best not to speak of the societies to outsiders.”

“We are doing things far more important—things you wouldn’t begin to understand, Blaikie.”

“Just how many of you Technology boys are there?”

Throwing out his chest, Bob answered, “Fifteen men in the Class of ’68. About thirty-five in the other three classes, and we expect more than ever in the next freshman group.”

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