THE OPPENHEIMER ALTERNATIVE

A NOVEL

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For

ALISHA SOUILLET

Who made this a better book
And me a better person

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Most of all, thanks to Carolyn Clink, the strong nuclear force that keeps everything from flying apart.

DRAMATIS PERSONAE

Luis Alvarez (1911-1988): American physicist; 1968 Nobel laureate.

Stepan Zakharovich Apresyan (1914-1990): Russian diplomat and spy; vice-counsel at the Soviet Consulate in San Francisco.

Kenneth Bainbridge (1904-1996): American physicist; director of the Manhattan Project's Trinity test.

Hans Bethe (1906-2005): German-born American physicist; 1967 Nobel laureate.

Patrick Blackett (1897-1974): British physicist; Robert Oppenheimer's tutor at Cambridge's Cavendish Laboratory; 1948 Nobel laureate.

Niels Bohr (1885-1962): Danish physicist; 1922 Nobel laureate.

Vannevar Bush (1890-1974): Head of the U.S. Office of Scientific Research and Development.

James F. Byrnes (1882-1972): Secretary of State under Harry S. Truman.

Barbara Chevalier (1907-2003): First wife of Haakon Chevalier.

Haakon Chevalier ["HOKE-on SHEV-al-EE-eh"] (1901-1985): American-born professor of French literature at the University of California at Berkeley and translator at the Nuremberg Trials.

Robert Christy (1916-2012): Canadian-born physicist.

Arthur Holly Compton (1892-1962): American physicist; 1927 Nobel laureate.

Edward Condon (1902-1974): American physicist.

Watson Davis (1896-1967): editor, Science Service.

Peer de Silva (1917-1978): Manhattan Project security officer.

Major General Walter Dornberger (1895-1980): Military leader of Germany's V-2 rocket program.

Helen Dukas (1896-1982): Einstein's live-in secretary.

Freeman Dyson (1923-): British-born American physicist.

Albert Einstein (1879-1955): German-born Swiss/American physicist; 1921 Nobel laureate.

George C. Eltenton (1905-1991): British chemical engineer (or so it was thought at the time; actually a physicist) for Shell Development in California who approached Haakon Chevalier on behalf of Russia.

Ward V. Evans (1880-1957): member of the 1954 Atomic Energy Commission security-review board.

Enrico Fermi ["FAIR-mee"] (1901-1954): Italian-born American physicist; 1938 Nobel laureate. In 1942, he produced the first-ever controlled nuclear chain reaction at the University of Chicago.

Richard Feynman ["FINE-man"] (1918-1988): American physicist; 1965 Nobel laureate.

Lloyd K. Garrison (1897-1991): American lawyer; represented Oppenheimer before the 1954 Atomic Energy Commission security-review board.

Kurt Gödel (1906-1978): Austrian-born American logician.

Gordon Gray (1909-1982): chairman of the 1954 Atomic Energy Commission security-review board.

General Leslie R. Groves (1896-1970): Head of the Manhattan Project.

Bourke Hickenlooper (1896-1971): United States senator and past chairman of the Joint Committee on Atomic Energy.

Verna Hobson (1923-2004): Robert Oppenheimer's secretary at the Institute for Advanced Study.

J. Edgar Hoover (1895-1972): Director of the Federal Bureau of Investigation.

Dieter Huzel (1912-1994): German rocketeer working under Wernher von Braun.

Lt. Lyall Johnson (1914-2006): American counter-intelligence officer stationed on the campus of the University of California, Berkeley.

Lyndon B. Johnson (1908-1973): 36th President of the United States, in office 22 November 1963 to 20 January 1969.

George Kistiakowsky (1900-1982): Ukrainian-American chemist, leader of explosives group at Los Alamos.

Anne Wilson Marks (1924-2006): Robert Oppenheimer's secretary at Los Alamos.

Herbert Marks (1907-1960): Robert Oppenheimer's lawyer (and Anne's husband).

Lt. Col. (and later Major General) Kenneth Nichols, Ph.D. (1907-2000): General Groves's assistant, and, later, general manager of the Atomic Energy Commission.

J. Robert Oppenheimer (1904-1967): American physicist, scientific director of the Los Alamos site of the Manhattan Project; director of the Institute for Advanced Study.

Katherine "Kitty" Oppenheimer (1910-1972): German-American botanist; wife of Robert Oppenheimer.

Katherine "Tyke" Oppenheimer (1944-1977): Robert and Kitty's younger child, known as "Toni" when she was older.

Peter Oppenheimer (1941-): Robert and Kitty's older child.

William S. "Deak" Parsons (1900-1953): associate director of the Los Alamos laboratory under Oppenheimer; weaponeer on the *Enola Gay;* promoted to Rear Admiral following the war.

Lt. Col. Boris Pash (1900-1995): American military intelligence officer; commander of the Alsos Mission into Germany.

Isidor Isaac Rabi ["ROB-ee"] (1898-1988): Austrian-born American physicist; 1944 Nobel laureate.

Roger Robb (1907-1985): attorney for the Atomic Energy Commission.

C. Arthur Rolander, Jr. (1920-2017): First, the Atomic Energy Commission's deputy director of security, then vice-president of General Atomic.

Robert "Bob" Serber (1909-1997): American physicist; Robert Oppenheimer's close colleague.

Rita "Pat" Sherr (1916-1997): wife of physicist Rubby ["ROO-be"] Sherr; looked after Robert Oppenheimer's daughter.

Robert Sproul (1891-1975): President of the University of California, Berkeley.

Henry L. Stimson (1867-1950): Secretary of War during both World Wars.

Lewis L. Strauss ["Straws"] (1896-1974): Chairman of the Atomic Energy Commission.

Leo Szilard ["LAY-o SIL-ard"] (1898-1964): Hungarian-born physicist.

Jean Tatlock, M.D. (1914-1944): American Communist Party member; Robert Oppenheimer's mistress.

Ted Taylor (1925-2004): Mexican-born American physicist who worked at Los Alamos and then headed the *Orion* project.

Edward Teller (1908-2003): Hungarian-born physicist, often called "the father of the hydrogen bomb."

Charles Tobey (1880-1953): United States senator.

Harry S. Truman (1884-1972): 33rd President of the United States, in office 12 April 1945 to 20 January 1953.

Harold Urey (1893-1981): American physical chemist; 1934 Nobel laureate.

Joseph Volpe (1914-2002): legal counsel for the Atomic Energy Commission.

Magnus von Braun (1919-2003): younger brother of Wernher von Braun.

Wernher von Braun ["VAIRN-er fon Brrrown"] (1912-1977): German rocketeer.

John von Neumann ["von NOY-man"] (1903-1957): Hungarian-born American mathematical physicist.

Henry A. Wallace (1888-1965): vice-president of the United States under Harry S. Truman.

AUTHOR'S NOTE

Every character in this novel was a real person and, with the exceptions of Freeman Dyson and Peter Oppenheimer, is now deceased. The Manhattan Project and Project *Orion* both really existed as described here, and the Institute for Advanced Study still exists.

The chapter-head quotes are all real, and, thanks to the published recollections of the participants, official transcripts, illicit recordings, and so on, some of this novel's dialog is real, too.

That is what novels are about. There is a dramatic moment and the history of the man, what made him act, what he did, and what sort of person he was. That is what you are really doing here. You are writing a man's life.

—I.I. RABI, testifying at Robert Oppenheimer's security hearing

PROLOGUE

What pithy words should one use to sum up the life of J. Robert Oppenheimer before dropping the urn with his ashes overboard?

Do you wax poetic about the precocious child who, at age twelve, gave a lecture to the venerable New York Mineralogical Club? Perhaps you'd discuss his rise to fame in 1945 as "the father of the atomic bomb"—and then lament the McCarthy Era witch-hunt that later sought to strip his security clearance? You might even include a word or two about his supposedly quiet twilight overseeing the monastic Institute for Advanced Study in Princeton.

In the end, Kitty Oppenheimer, the compact alcoholic for whom Robert had been the fourth—albeit longest-serving—husband, said nothing while raindrops fell like bombs from the heavens. She let go of his urn seconds after dangling it over the gunwale of the motorboat that she, their twenty-two-year-old daughter, and two friends had taken out from the Oppenheimer beach house on Hawksnest Bay that monochromatic afternoon in February 1967.

Surprisingly, the urn didn't sink at once. Rather, it bobbed up and down as if empty, the waves themselves giving the storied physicist a final sinusoidal eulogy before the container, taking on water, at last sank beneath the choppy surface.

1

1936

I have to explain about Oppie: about every five years, he would have a personality crisis; he would change his personality. I mean, when I knew him at Berkeley, he was the romantic, radical bohemian sort of person, a thorough scholar …

—ROBERT R. WILSON, American physicist

"You're bad luck for me," said Haakon Chevalier. "I hope you know that."

Robert Oppenheimer looked at his friend, seated next to him on the pink-and-green living-room couch as the party bustled about them. Oppie's sense was the exact opposite: Hoke had brought him nothing but good fortune, including getting him into this offbeat rooming house here on Shasta Road. "Oh?"

"Absolutely. When I go places without you, *I'm* considered the attractive one."

Oppenheimer made a small chuckle. Chevalier, who had just turned thirty-five, was three years his senior, and was indeed movie-star handsome: gallant, as befitted his last name, and long of face, with wide-spaced eyes and sandy hair swept back in a slight pompadour.

By comparison, Oppie knew he himself was scrawny, his tall body angular, his coarse black hair a wild nimbus, and his duck-footed gait

awkward—one friend had described it as a constant falling forward as if he were forever tumbling into the future.

"See that one over there?" continued Hoke, with a subtle nod. "She hasn't glanced at me once since we got here, but *you*—" Chevalier shook his head in good-natured exasperation. "It's those goddamn eyes of yours, I tell you. Fucking opals."

Oppie was used to compliments about his pale blue eyes: he often heard them called "transparent" or "luminous," but this metaphor was new to him. He smiled as he turned to look at the woman Hoke had indicated, and—

And, my God, he'd seen that lovely face before—he was sure of it. But where? "Wow," said Oppie softly.

"Wow, indeed," agreed Hoke. "And she keeps looking your way. You should go over and say hello."

"I … um …"

"Oh, for Pete's sake, Robert, go! You study the mysteries of the universe; girls are simple by comparison."

Hoke taught French literature at the University of California's Berkeley campus; Oppie was a professor of physics there. Normally, members of such diverse faculties would have little to do with each other, but Oppie loved French poetry, and the two men had become great friends. One advantage Hoke had was a lot of female students—he'd married one, in fact—whereas in Robert's circles, women were rare. "Come on," said Hoke. "Give me a story to tell Barb when I get home. Go try your luck."

Luck. Einstein said that God didn't play dice with the universe—but, then again, God probably wasn't itching to get laid. "All right already," Oppie said, unfolding himself from the couch. Of course, he couldn't just go up and say hello, but Mary Ellen, his landlady, was swirling by in one of her floor-length batik dresses. She threw many parties, often as fund-raisers. This one was for the Republicans in Spain—or maybe it was for the Spanish Nationalists? Whoever the good guys were, anyway; Oppie had come downstairs from his room for donuts and drinks, not the cause.

"Say, Mary Ellen, I wonder if you might—"

"Robert! So good of you to pull your nose out of your books and join us! But your glass is empty. Let me—"

"No, no; I'm fine. But if you could …" He gestured feebly at the busty young woman seated by the fireplace.

"Ah!" said Mary Ellen, her wide face splitting in a grin. "Yes, of course!" She took Oppie's hand and pulled him across the crowded room. "Jean," she said, and the woman looked up, "this is my best tenant—oh, hush, Fred; you know I love you, too! This is Robert. He teaches physics. Robert, Jean here is studying to be a doctor." Mary Ellen managed to make an art-deco chair appear out of nowhere and maneuvered Robert onto" it so that he was facing Jean. "Now, let me get you a drink!"

"A doctor," said Oppie, impressed, smiling at Jean.

"Yes. A psychiatrist, in particular." Jean's voice was warm. She was, as he'd noted from across the room, beautiful—even more so close-up. "I'm fascinated by Freud," she continued. "Do you know his work?"

Well, well: look at those dice. Six the hard way! "I do indeed. In fact, I know Ernest Jones."

"Oh my!" said Jean. "Really?"

"Yes. We, ah, met when I was at Cambridge in 1926." Jones, a great friend of Freud, was the first English-speaking practitioner of psychoanalysis and had become its chief proponent in the English world.

"Tell me—my God, tell me everything about him!"

Mary Ellen fluttered by again, giving Oppie a bourbon and a wink, then went upon her way. "Well," said Oppie, "he was practicing in Harley Street …" As he spoke, he continued to study her smooth, classically beautiful face and striking green eyes, emeralds to his opals. Jean wore her black hair short and had a slight dimple in her chin. She was probably a decade younger than he was.

They talked for most of an hour, and the conversation slipped easily from topic to topic. He was enthralled by that hauntingly familiar beauty of hers *and* by her nimble mind and ready wit, and yet she was mercurial. One moment she'd seem animated and boisterous, the next fragile and sad. Still, against a noisy background of someone banging away on the piano, dozens of overlapping conversations, and the clink of glasses, he listened attentively, although at one point he had to hold up his hand to stop her. "My

family," she said, "moved out here from Massachusetts just before the crash, and—"

"You were in an accident?"

She looked at him for a moment, puzzled. "No. The stock-market crash."

Oppie shook his head slightly.

"The stock-market crash of 1929. The beginning of the Great Depression."

"Oh—ah, yes. Yes, of course."

"You don't know, do you?" Jean looked amazed. "Where have you been?" He wished she'd gone on to add the words *all my life,* but instead she finished by observing: "Born with a silver spoon in your mouth, were you?"

"Well, I—I mean, my father did all right." Then he added, as if somehow it explained his ignorance: "He invested, but mostly in art, not stocks."

She tilted her head again, and the light from the porcelain table lamp hit her just *so,* and he suddenly realized where he'd seen that face before. Oppie's favorite book was Baudelaire's poetry collection *Les Fleurs du mal.* The shape of Jean's face and the curve and length of her nose were identical to that of the woman in the etching accompanying Baudelaire's heartbreaking *"Une Martyre"* in the glorious 1917 edition. He frowned, ousting the thought. That etching was gruesome: the woman's head had been severed, a beauty cut down in the flower of youth as her older lover traveled the world.

The evening at last wound down, and Oppie, four drinks in, was ready to ask the young lady out. "And so, Miss …" he began.

"Tatlock," she said, and the crisp syllables hit him like bullets.

"Are … are you related to John Tatlock?"

"He's my father."

"John Tatlock? The medievalist at Berkeley?"

"Yes, why? Do you know him?"

Oh, yes, thought Oppie. John Strong Perry Tatlock was an expert on Geoffrey Chaucer, a towering presence at Berkeley faculty-association meetings, a loud voice often heard booming across the Faculty Club dining hall—and a raging anti-Semite. That wasn't unusual at Berkeley; when Robert had tried to get his student Bob

Serber a job there, the physics chairman had said that having one Jew in his department was quite sufficient. But … *damn.*

"Ah," said Oppie, his stomach knotting; he hadn't mentioned his own last name. He got up from the funky chair. "Well," he said sadly, "it was nice meeting you." He made his way toward the staircase that led up to his lonely room.

Jean was present at the next party Mary Ellen hosted, and the one after that, each time just as lovely, just as magnetic. Finally, her father's prejudice be damned, Oppie mustered the courage to ask her to dinner.

"Where would you like to go?" she replied, and he was flustered again. Did that mean her acceptance was a given, or that it was now contingent on him naming a suitably posh place? "I, um, well—"

"Oh, it doesn't matter!" she said, smiling. "Do you like spicy?"

"Very much so."

"There's a place over in San Francisco, the Xochimilco Café. Do you know it?"

He shook his head.

"Well, good! Then it can become *our* place! Saturday night? Or—or do you …?" The question, he realized, was a belated reference to his Jewishness.

"No, Saturday is fine."

And it *was.* The café, which had a name more appropriate to the southwest he'd loved in his youth than the northern California he was in now, was a dive. Not that it mattered; she'd been right that money wasn't a concern for him—he'd happily have taken her to the most-expensive seafood place on the wharf. But the booth they found was suitable for conversation, the *carne adovada* agreeably piquant, and the tequila strong and plentiful.

She was, he discovered, a member of the Communist Party and wrote for its newspaper, *The Western Worker.* When she spoke of downtrodden people, of the fight for liberty—common coin on the Berkeley campus, stuff he'd previously tuned out as background noise—he found himself listening, nodding, and repeatedly interjecting, "Yes, yes, yes!"

That night, he walked her home. After a block, she reached over and took his hand. When they arrived at the entrance to the small building she lived in, they could hear a jazz recording through a neighbor's open window; she told him it was Benny Goodman's latest, "The Glory of Love." Oppie pulled her near and, bending his head down, he kissed her for the first time, starting slowly, gently, but, as she responded, growing more and more passionate.

They began dating regularly. A few years before, he'd given a talk entitled "Stars and Nuclei" to the Caltech astronomy club; he'd studied the largest and smallest of objects, but, until Jean, he'd missed seeing the human world all around him.

Still, it wasn't long before he learned of the darkness that chased her inner light—her mood swings, her nightmares; she was a chimera, angel and demon in one body, the would-be psychiatrist who had long seen a psychiatrist of her own. Despite it all, he came to love her unwaveringly, and she, with the deeper feelings both high and low that heaved and tossed her spirit, perhaps loved him even more.

After only a few months, they were engaged … and then, bewilderingly, Jean broke it off. "Not ready," she said, and "Too soon." They continued to date, though, and he finally worked up the courage to ask her a second time to marry him. She agreed, but then, weeks later, once again changed her mind: she did love him, she insisted, but said he deserved more, better, and his protestations failed to sway her. Robert, heartbroken, started seeing other women, including Kitty, the petite temptress, the flirtatious vixen, the skilled horsewoman who could, or so it seemed, break any stallion. To his surprise at the time, she was soon pregnant. He did the honorable thing—did his duty—and married her.

But it was winsome, bittersweet Jean Tatlock, not Kitty, who was forever in his heart, his mind, the soulmate he could never have.

2

SIX YEARS LATER: 1942

Question:What is an optimist? Answer: One who thinks the future is uncertain.

—LEO SZILARD

Leo Szilard, still cherubic at forty-four, had been warned about this visit. General Leslie Groves was coming to the Metallurgical Laboratory, the drab code name given to the facility at the University of Chicago that studied the fissionable elements uranium and plutonium. The man who'd been merely a colonel days ago had apparently leveraged a promotion to go along with being appointed head of—what the hell were they calling the overall bomb effort now? Ah, yes: "The Manhattan Engineer District."

Leo suspected he'd soon have some obscure code name himself. His preference would be "Martian Number One." Enrico Fermi, who believed the universe should be teeming with intelligent life, had exhorted Leo to explain the absence of these advanced visitors, which, for lack of a generic term, Enrico had taken to calling "Martians." Leo had quipped, "Oh, we are here—but we call ourselves Hungarians."

Szilard had already bestowed nicknames on others, which he mostly kept to himself. His largely platonic girlfriend Trude, a dozen years younger, was *"Kind,"* the German for "child." Eugene

Wigner, a fellow Martian, was "Pineapple Head," in honor of his oddly prolate noggin. And he'd decided the best name for this general who had burst into their seminar room in Eckart Hall was "Bumpy," commemorating both his lumpy exterior and his bumptious nature. Leo couldn't fault a person for being overweight; his own fondness for pastries and rich sauces had made him, as Trude affectionately chided from time to time, more than a little rotund. But a man's clothes should fit, for God's sake, and this blustering martinet's jacket seemed at least one size too small.

The general and his military aide had been brought to see this group—the Met Lab's fifteen most-senior scientists—by Arthur Holly Compton, the jutting-jawed director of the laboratory. The seminar room was large and luxurious with built-in glass-fronted bookcases, plush maroon leather furniture, and two blackboards, one wall-mounted and another that had been wheeled in. A central mahogany table was strewn with papers, dog-eared journals, and coffee mugs.

Thirty-two-year-old Luis Alvarez, lanky and intense, was trying to answer the general's slew of questions by writing equations on the built-in blackboard, but that oaf had the gall to interrupt him. "Just a second, young man. In the third equation, you've got the exponent as ten-to-the-minus-five, but then it magically becomes ten-to-the-minus-six on the next line."

"Oh, yes, yes," replied Alvarez sheepishly, rubbing out the mistake with his thumb and writing in the correct value. "Slip of the chalk."

"That raises a question," Groves said to the whole group. "Your estimates for how much fissionable material you'll need—how accurate are they?"

Leo, with his shoeless feet propped up on a vacant chair, shrugged slightly. "Within a factor of ten."

"A factor of ten!" exploded Groves. "That's idiotic! That's like telling a wedding caterer to prepare for a hundred guests when the real number could be anywhere from ten to a thousand. No engineer can work with sloppy figures like that."

"General …" said Leo, giving him his newfound title in hopes of placating the brute, "you have to understand—"

"No," snapped Groves. "All of *you* have to understand. This isn't a theoretical project; it's a practical one. I have to build actual working bombs." He took a deep breath then let it out loudly. "Now, you lot may think engineers are just technicians"—Leo had the good sense not to interject—"and you may know that I don't have a Ph.D. Colonel Nichols here has one, but I don't. But let me tell you that I had ten years of formal education after I entered college—*ten full years.* I didn't have to make a living or give up time for teaching. I just studied. That'd be the equivalent of about *two* doctorates, wouldn't it?"

Leo swung his feet off the chair and leaned forward. "Sir," he said, the word almost a hiss, "I would never claim your rank—even if you have only just attained it—as my own. But forget doctorates; everyone in this room, save you, has one."

"Leo …" cautioned Compton, thin eyebrows drawn together in a don't-do-this glare.

"No, no, no," said Szilard. "We're trotting out credentials here, are we not? And you, Arthur, you are none other than the winner of the 1927 Nobel Prize in physics." Leo locked his gaze on Groves. "Maybe you saw him on the cover of *Time* a few years ago?" Szilard then indicated a slender, balding man seated on the opposite side of the table. "And him? That's Enrico Fermi. He won the 1938 Nobel. And next to me?" He pointed to an egg-headed man with a mustache. "Say hello to James Franck, the 1925 Nobel laureate. As for me, I have collaborated with—and share patents with!—Albert Einstein."

Groves rose, fuming. "I'm going to Berkeley," he snapped, "but I'll be back in a few days." He jabbed an accusatory finger at the blackboard. "And I expect *precise* answers when I return." His footfalls on the hardwood floor shook the bookcase glass as he stormed out.

Leo got up, turned to face his colleagues, and spread his arms. "I warned you how it would be if the military were allowed to take over! How can we work with people like that?"

Compton had calmed down a bit. "Well, once Groves gets to Berkeley, Oppie will set him straight on the theoretical issues."

Szilard frowned. Oppenheimer? Too eager to please, too much of a climber. Oh, sure, charismatic in person—who hadn't felt that?

But as the champion of science and reason against Bumpy Groves? "May God have mercy on our souls," Leo said, shaking his head.

Robert Oppenheimer gazed out the mammoth window in the university president's living room, lost, as often, in thought. Of course he was thinking about the vexing problem of isotope separation, but—

Isotopes were the same element but different—both *this* and yet each separately *that*. Just as it was with the women in his life, both beautiful and brilliant, but different, too: Kitty, who demanded to be satisfied, and Jean, whom he could never fully satisfy. The same and yet not: Kitty, who had been married to someone else when she first began dating Robert and who he'd now learned from friends had bragged that she'd gotten him to marry her "the old-fashioned way, by getting pregnant," and Jean, still there, still in his social circle, occasionally still in his arms, who ran away from commitment.

Robert hadn't been blind as time went on. His former landlady, that whirlwind of energy named Mary Ellen, and the delicate, moody Jean, now indeed an M.D., were more than casual friends. In just one of many ways in which Jean was pulled in multiple directions simultaneously, Mary Ellen—always confident where Jean was often diffident; always a confidant, as close as Oppie himself was—had also taken Jean to bed.

"Robert?"

The voice had been that of the reception's host, President Sproul. He turned. "Yes?"

Sproul—panther-lean, bespectacled, and wearing a gray three-piece suit—indicated the uniformed man next to him, and Oppie beheld the visitor. "General Leslie Groves, meet Dr. J. Robert Oppenheimer."

The term "fission" describing how a uranium nucleus could split into two had been borrowed from biology, and Oppie had a sudden flash of micrographs he'd seen of a dividing cell: an entity pinched in the middle to form bulbous halves. Groves's belt was the constriction and an ample gut billowed out above and below it.

The general was almost as tall as Oppie, with an elongated head weighed down by jowls and crowned by swept-back hair.

Groves sported a short, bristly mustache that had grayed at either side, lending the more-prominent dark part—inadvertently, Oppie was sure—a Hitlerian aspect. Binary stars adorned each side of his khaki collar. Oppie offered his hand, and Groves shook it firmly. "You're the head theoretician here," the general said as if it were an accusation.

Oppie nodded. "My actual job title is—if you can believe it—'Co-ordinator of Rapid Rupture,' but, yes, that's right."

"I'm a nuts-and-bolts man myself," said Groves. His voice reminded Oppie of the sound stones made in his lapidary tumbler. "An engineer."

Oppie nodded amiably. "You're in charge of building the Pentagon." The massive new structure in Virginia was nearly finished.

The general's eyebrows creased his forehead, clearly impressed that Oppie knew this. "Indeed I am." Oppie left unspoken the fact that Groves had also been in charge of building the internment camps for Japanese Americans. The army man looked around the vast room, apparently uncomfortable with the opulent surroundings. "I was hoping that I'd have earned my pick of assignments after the Pentagon—I wanted to see action overseas—but they gave me this thing."

"This thing," Oppie knew, was being in charge of the atomic-bomb project, including the work here at Ernest Lawrence's Radiation Laboratory and that at Arthur Compton's Metallurgical Laboratory in Chicago.

President Sproul apparently knew the way to this particular man's heart, at least: "Lunch will be served momentarily." Groves smiled at that, and Oppie smiled at Groves's smile.

"I'm glad they put an engineer in charge," Oppie said, turning on the charm as Sproul was beckoned away by another guest. "We scientists can spend far too much time woolgathering."

The general's eyes, a darker blue than his own, fixed on Oppie. "Are you free this afternoon? I'd like to talk to you some more."

It was all falling into place; Kitty would be so pleased. "Your wish is my command, General."

3

The gravitational deflection of light will prevent the escape of radiation as the star contracts. The star thus tends to close itself off from any communication with a distant observer; only its gravitational field persists.

—J. ROBERT OPPENHEIMER and HARTLAND SNYDER

Groves arrived at Oppie's office in Le Conte Hall accompanied by a colonel with thinning hair and round glasses—"Nichols," the general called him, and that let Oppie put a face to the name. This was Ken Nichols of the Manhattan Engineer District, whose office in New York had now lent its name to the entire American atomic-bomb effort. The British counterpart was code-named Tube Alloys, and heaven only knew what bland moniker the Soviet undertaking, if there was one, lurked behind.

Groves removed his army jacket, revealing a pressed shirt with crescent moons of sweat on either side. He handed the outer garment to Nichols and said, "Get this dry-cleaned."

Oppie took a drag on his cigarette. He knew that Nichols had a Ph.D. in hydraulic engineering from Iowa State. Once one received a doctorate, the grad-student lot of being an errand boy traditionally ended—but perhaps, to give him the benefit of the doubt, the general merely wanted privacy. Oppenheimer's assistant, the shy and

lisping Bob Serber, finally granted a job here despite his religion, was working away on the office blackboard. Oppie took the opportunity not only to ensure they were alone but also to reset the karmic balance. "Say, Bob, why don't you take Dr. Nichols here over to the Faculty Club for a drink? You can leave the dry-cleaning with Becky."

Oppie caught Nichols's eye, hoping for a grateful nod. Instead, what he saw on the man's bespectacled face was anger that Robert had witnessed his petty humiliation. Serber assented as he rubbed his hands together to disperse chalk dust.

Once the other two were gone, Oppie sat on the edge of his desk. The ceiling of the white-walled office consisted of two angled sections joining in a central peak. Groves moved to stand against the far wall, the low roof there making him seem even more imposing. "I saw Ernest Lawrence this morning," the general rumbled, "and his vaunted Calutron. You know how much uranium-235 he's managed to separate from 238 so far?"

"None?" ventured Oppie.

"That's right, none. And I was in Chicago a few days ago. That buffoon Leo Szilard and the rest are still just blue-skying instead of getting down to specifics. I'm knee-deep in physicists, and not one of you seems to understand *time.*"

Robert admired Szilard's bounding intellect, but he could certainly see how these two would clash. "Well," he said, "Einstein wrote FDR in August 1939, urging the development of an atomic bomb. It's now October of '42, over three years later, and we've barely started on that bomb. I'd say it's awfully late in the day, General."

"At last a practical man!" exclaimed Groves. "All right, Mr. Rapid Rupture, tell me: *can* it be done? Atomic fission?"

Oppie frowned. "It's a sweet problem. The answer is …" He paused deliberately for dramatic effect, then, firmly: "Yes."

Groves nodded, impressed. "How fast?"

"If we maintain a concentrated effort? Two years."

"Straight answers," Groves said. "I like that." He eyed Robert for a moment. "Okay, let's get this out of the way right now. Are you a member of the Communist Party?"

Oppie had been prepared for that question and kept his tone completely flat as he brushed ash from his cigarette with his pinkie. "No."

"Have you ever been?"

"No."

"Your wife was. And your brother Frank."

"True and true. And you'll find I've supported just about every left-wing cause there is, from the Teachers' Union to the Republicans in Spain over the last few years. But I've never belonged to the Communist Party and I've left all of those other things behind. There's work to be done."

"There is indeed," said Groves, "and there's no room for Communists in it."

"General, I give you my word: I'm not a Communist." A pause. "I'm an American."

"That you are," said Groves. "Born and raised—but so many of these others aren't. Germans, Hungarians, Italians, you name it. But Americans like you and me? We're thin on the ground."

Oppie tipped his head to one side but made no reply.

"All right, Professor, given how much catching up we have to do, how would you get us on track?"

"A central laboratory," Oppie said, playing his first card. "Get all us scientists together at one location." And then, laying the trump: "That'd make security a hell of a lot easier."

But Groves surprised him by *not* being surprised. "Yes, I've been thinking of that. Last month I ordered the acquisition of 59,000 acres in Oak Ridge, Tennessee, for uranium processing. Might be a good spot."

"No, no. It can't be seen as merely an add-on to an isotope-separation plant. We're talking about the heart and soul of the bomb effort. It should be a stand-alone facility."

The general stroked his jaw. "Maybe you're right. Who would you put in charge?"

"My boss here at Berkeley, Ernest Lawrence, is the logical first choice," said Oppie, pleased that the general and Lawrence had already clashed over the failure to produce any uranium-235. "Then there's I.I. Rabi at Columbia, or Edwin McMillan." But Oppie knew they couldn't be spared from their secret radar work. He threw out a couple more names, just for appearance's sake: "Or, from Caltech, Wolfgang Panofsky, say, or Carl Anderson."

Groves nodded at the mention of Anderson. "He won the Nobel for discovering the positron."

"True," said Oppie.

"And that raises a point. As I told those clowns in Chicago, I don't have a Ph.D., but in this project I have to be the leader of countless people who do. That's not a problem for me as I made it quite clear to them that I've got more than the equivalent in post-secondary education. But suppose I decide I want to put *you* in charge of this hypothetical out-of-the-way lab? You'd be a thornier case. Many of the men you'd be leading have already won the Nobel Prize, but you haven't."

Oppie raised his chin. "Not yet."

Groves leaned back and barked a laugh. "I admire a man who has faith in himself."

"It's not a question of faith, General. The work has already been done. In 1938 and 1939, I published three papers in the *Physical Review,* each with a different one of my grad students. Now, it sometimes takes the Swedish Academy a while to recognize an achievement as Nobel-worthy, and, unfortunately, we were hit with quite a stroke of bad luck: the very day the final and most important of the three papers was published, Hitler invaded Poland, and this damned war began."

"September first, 1939," supplied Groves.

"Exactly. And the world has been preoccupied ever since. However, once the war is over, those papers will be rediscovered, and their import noted. Then it's only a matter of *when* I'll get the Nobel, not *if.*"

Groves made an impressed face, but then shook his massive head. "Well, for my purposes, if you don't get it until after the war, it doesn't help. But, okay, I'm curious. What's this great breakthrough that nobody noticed at the time?"

"There's a terrific Russian physicist named Lev Landau. He believed he'd figured out what causes the heat of the sun. He thought the center of the sun is a condensed neutron core. That is, at the sun's heart, all the orbiting electrons have been crushed down to combine with protons to become neutrons, and those neutrons, plus the ones that had already been part of the atomic nuclei at the core,

are *all* that's left: solid neutron-degenerate matter. It was a great notion and explained wonderfully how the sun stays warm—the kinetic energy of in-falling matter being pulled down by the ultra-dense core. But Bob Serber—that's the fellow who I sent off just now with Colonel Nichols—Bob and I realized that Landau had failed to take into account the strong nuclear force. If you factor *that* in, the sun would give telltale signs of having that sort of core, and it doesn't."

Groves looked at Oppie, clearly unimpressed, but before the general could voice an objection, Oppie raised a hand. "Now, as I said, that was the *first* paper, and, yes, it wasn't all that much in itself. But it led directly to the *second* paper, which I wrote with George Volkoff. In that one, we determined that sufficiently heavy stars will, at the end of their lives, contract *indefinitely."*

Groves frowned. "Indefinitely? What does that mean?"

"Good question," said Oppie with a grin, "and the answer was what the *third* paper was about, a collaboration with my grad student Hartland Snyder. Indefinite contraction, we showed, will lead to a point of zero volume and infinite density, with gravity so strong that nothing, *not even light itself,* will be able to escape the pull. That's a whole new class of astronomical objects, and one with properties nobody had guessed at before. A few kilometers from the center, at what's called the Schwarzschild radius, time itself will freeze, thanks to relativity but, for an in-falling observer, it will continue to pass. There's nothing intuitively obvious about these … these … 'dark abysses,' if you will, but they absolutely must exist."

Groves leaned back, an expression of awe on his face. "And *that's* worth a Nobel," he said softly.

Oppie nodded and crossed his arms smugly. "That's worth a Nobel."

"Jim, you'll be interested to know that the Italian navigator has just landed in the New World."

It was code, of course: the Italian navigator was Leo Szilard's colleague Enrico Fermi, who had led today's successful experiment. After months of labor, Fermi's team had created that which Szilard himself had been the first to envision nine years previously:

a controlled nuclear chain reaction. This afternoon, the world's first atomic reactor had run for twenty-eight minutes—the first, that is, unless Nazi physicists had beaten them to the punch.

Szilard stood near his boss, Arthur Holly Compton, in the latter's office at the University of Chicago. Arthur was on the phone with James Conant, chairman of the National Defense Research Committee, the organization in charge of secret war technology for the United States. Conant must have asked how the natives were because Arthur's reply was, "Very friendly."

Silence while Arthur listened for a moment. "No," he said into the mouthpiece, "I suspect he's gone … back to port." A pause. "Yes, he's here; let me put him on." He handed Szilard the black handset. Never one for formalities, Leo said, "Hello, Jim." His Hungarian accent made the name sound a bit like "Yim."

"Congratulations, Doctor!" The voice was warm although there was much static crackling behind it. "None of this would ever have happened without you."

Szilard rubbed his forehead with his free hand and said, because he knew it was what he was supposed to say, "Thank you," and then he handed the phone back to Arthur.

Leo liked to think either in his bathtub—he often soaked for hours—or quite literally on his feet. He excused himself and headed out into the cold evening air while Arthur went back to his oblique conversation. As Leo ambled across the campus, he passed many students, some clutching textbooks, a few holding hands, and he felt twinges of guilt. If something had gone wrong today, all these young people at the beginnings of their lives, along with, quite possibly, almost everyone else in Chicago, could easily have been killed.

Leo's breath blossomed into clouds in front of him. He hadn't had a destination in mind, but his feet brought him across the width of Stagg football field. There'd been snow earlier in the week that had melted, leaving the brown grass dry. He made his way toward the concrete rows of angled seating that ran along the west side. The brick structure beneath these bleachers housed various athletic facilities; Leo greeted the guards at the north end and headed into the doubles squash court that had been their experimental working space.

A short figure with a receding hairline and an oblong face was looking down from the court's spectator gallery at the giant cube of graphite blocks. The other scientists, doubtless in a mixture of elation and exhaustion, had all left, but Enrico Fermi leaned on the railing, just staring, apparently lost in thought.

The beast below was hibernating, all fourteen cadmium control rods having been shoved back in, *picas* into the hulking body of *el toro.*

Leo approached and solemnly offered his hand; Enrico took it. Their names had already been linked forever in history—or would be, once the security was lifted—thanks to the letter to President Roosevelt that Leo had drafted three years ago. That letter, signed by Einstein himself, had begun:

> *Some recent work by E. Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into a new and important source of energy in the immediate future.*

"Well, we did it," said Enrico, with his Italian accent. But this was only the beginning, and they both knew that. The Einstein letter had gone on to say:

> *This phenomenon would also lead to the construction of bombs, and it is conceivable—though much less certain—that extremely powerful bombs of a new type may thus be constructed.*

"Yes," Leo replied, "we did." He let go of Enrico's hand and shook his head slowly, looking at their creation below. "This will go down as a black day for mankind."

4

1943

History, though coy, needs truth to be her handmaiden.

—HAAKON CHEVALIER

"*. . . Some sunny day!*" Kitty Oppenheimer and Barbara Chevalier reached the song's rousing conclusion. Their husbands applauded, Oppie clamping his cigarette between his teeth so he could do so with gusto. Kitty rose from the piano bench, and the two women bowed theatrically.

Oppie got up from the living-room couch, clutching his empty martini glass, and said, "Another round?" He knew the answer: their two dinner guests considered his martinis legendary; Oppie himself took them as evidence that although he'd settled on physics, he'd have made a damn good chemist, too.

Kitty, a brunette, merely raised her thin eyebrows in a "need you even ask?" expression, and Barb, blonde with green eyes, declared an enthusiastic, "Yes, please!"

Oppie collected the other glasses on a sterling-silver tray. He was about to turn toward the kitchen door when, to his surprise, Haakon Chevalier, an inch taller than Oppie's six feet, lifted himself from the couch. "I'll give you a hand."

"Forsaking the company of two beauties for me?" said Oppie. The tension between Haakon and Barb had been palpable all evening; the singing had helped, and Oppie hoped his remark would lighten the mood even more. He motioned with his head for Haakon to get the door, and the two of them entered the spacious kitchen, the smell of an almost-ready suckling pig greeting them. The heavy wooden door swung shut.

"We're going to miss you," Haakon said as Oppie put down the tray of used glasses, Kitty's and Barb's obvious by their bright-red lipstick marks. "Berkeley won't be the same without you."

Oppie had a second set of long-stemmed conical glasses in the freezer. He pulled them out and—his signature flourish—pressed each one facedown as though it were a cookie cutter into a shallow pan filled with lime juice and honey. He was conscious of Haakon's eyes on him, watching the master at work.

"Any hint of where you're going?" Haakon asked.

Having now set the glasses down, Oppie poured Black Bear gin into his cocktail shaker then, with a practiced flick of his wrist, added a splash of vermouth. He thought about replying, "Somewhere even drier than my martinis," but, no, that witticism had to die unspoken in the name of security. It was such a strange thing to get used to—and, really, if he couldn't trust Hoke, his closest friend, whom could he? "Sorry," he said affably. "My lips are sealed."

Haakon smiled but tipped his head toward a vodka bottle sitting next to the sink. "Genuine Russian, I see. Thank God we're not at war with *them.*"

"Ha," said Oppie as he expertly manipulated the shaker.

"Speaking of the Russians, Robert, do you know George Eltenton?"

Eltenton was a chemical engineer at Shell Development. Was Haakon taking a dig at Eltenton's Communist leanings? That wouldn't be in character; Hoke was as Red as anyone. "Not well," Oppie replied, apportioning his potent mixture among the four glasses. "But he's been to this very house. He's a member of FAECT"—the Federation of Architects, Engineers, Chemists, and Technicians—"and came to a meeting here a couple of years ago; I was trying to get the boys at the Rad Lab to join the American Association of Scientific Workers."

"A good union man," Haakon said, nodding his approval, but Oppie wasn't sure if he meant him or Eltenton.

"It didn't go anywhere," continued Oppie. "Just as well. Lawrence blew a gasket when he found out—wanted me to give him the names of those who'd been at the meeting. Naturally, I refused."

"Commendable," said Haakon. "Anyway, it's good you know George. He and I move in some of the same circles"—meaning, Oppie knew, the Communist Party—"and a fellow at the Soviet consulate in San Francisco had a word with him."

"Yes?" said Oppie, deploying olives now.

"Well, we're all on the same side, and the Soviets—no, one is plenty—well, the Soviets have gotten wind, I guess, of what's been going on at our university. You've never said, but everyone assumes it's of great importance."

Oppie made no reply.

"And so George was wondering if, you know, in the spirit of openness, if you were so inclined—that is, if you wanted to—well, any technical information that went to him would very discreetly find its way to your scientific colleagues in Russia."

The wall clock ticked off seconds. Oppie kept his tone as even as he could. "That's treason."

"Of course, of course," said Chevalier. "I just thought you'd want to know."

"I want nothing to do with anything like that."

Haakon nodded and helped himself to one of the glasses. He took a sip. "Perfect, as always."

In May 1943, Oppie, Kitty, and their son Peter, who had just entered the terrible twos, arrived at the place that would variously be called Site Y, the Hill, the mesa, or, in commemoration of the poplar trees that abounded here, Los Alamos. Oppie knew this part of northern New Mexico well. He'd spent the summer of 1922 here, an eighteen-year-old kid in need of toughening up following a string of illnesses before entering Harvard that fall. He had learned to ride horses then and ever since had been in love with the austere, feral countryside.

He'd returned to this area with his younger brother Frank in the summer of 1928, leasing a rustic cabin made of halved tree trunks held together by adobe mortar, a cabin Robert continued to rent to this day. Upon first learning of its availability, he'd exclaimed "Hot Dog!" and the Spanish equivalent, *Perro Caliente,* had become the place's name.

So, when he, Leslie Groves, and a few others had begun scouting a location for their secret atomic-bomb lab, Oppie had led them to what he and the General quickly agreed was the perfect spot: a boy's ranch school situated atop the two-mile-long Pajarito Plateau, 7,300 feet above sea level. Groves acquired it by eminent domain, and Oppie snared for his family one of the six existing houses, originally occupied by the school's masters, on what came to be known as Bathtub Row. Other accommodations—rude and shoddy since they were only expected to last the duration of the war—were soon under construction; they would have only showers.

General Groves could have claimed one of the Bathtub Row houses for himself, but he wouldn't normally be on the mesa; his principal office was in the War Building in Washington. But he was there the day Robert chose the Oppenheimer abode. "Very good," he said. "I'd have picked that one, too." The general paused—something he rarely did—then said, "I've got you a little house-warming present." He handed a small tin case, less than an inch wide, to Oppenheimer.

"Snuff?" said Oppie. "General, I—"

"No, not snuff." And then Groves made an odd sound, which Oppie supposed was his chuckle. "Well, it's *for* snuffing, but …" He pointed at it. "Open it up."

Oppie dug a fingernail under the case's cover. It hinged back, revealing a small brown oval capsule surrounded by soft padding.

"Potassium cyanide," said Groves. "You're to carry it with you until the war is over, and, yes, before you ask, I've got one, too." He patted a pocket. "Everyone at the top levels is getting them."

"Good grief, General, isn't that a little melodramatic?"

"What do you think all this talk of security has been for? The Germans are doubtless trying to build an atomic bomb; so, I'd bet my life, are the Russians. But *we've* got the best minds, and the

easiest thing for them to do is kidnap you or other key members of your team. If you're captured, they *will* torture you, and they *will* succeed in getting you to talk—unless you take that first. It's glass, covered in rubber to help keep it from breaking accidentally. Don't swallow it; it'll go right through your system intact. Instead, chomp down on it. You'll be dead in a matter of minutes."

Oppie looked at the capsule. It was only the size of a pea, but it reminded him of an apple from long ago.