

[Back to Article page](#)

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## Uncle of the Bomb

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*Something Incredibly Wonderful Happens: Frank Oppenheimer and The World He Made Up* by K.C. Cole  
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HUAC: Is your brother a member of the Communist Party?

Robert Oppenheimer: He is not a member of the Communist Party, to the best of my knowledge.

HUAC: Are you speaking as of the present time?

Robert Oppenheimer: I am, sir.

HUAC: Was he a member of the Communist Party in the past?

Robert Oppenheimer: Mr Chairman, I will answer the questions you put to me. I ask you not to press these questions about my brother. If they are important to you, you can ask him. I will answer, if asked, but I beg you not to ask me these questions.

HUAC: I withdraw the question.

Frank Oppenheimer, Robert Oppenheimer's younger brother, had been in the Party. He had been publicly outed as a Communist in 1947, two years earlier, when a Washington newspaper – almost certainly fed the information by the FBI – headlined the allegation: 'US Atom Scientist's Brother Exposed as Communist Who Worked on A-Bomb.' Frank flatly denied it: 'I am not now and I never have been a member of the Communist Party.' The lie was meant to protect his powerful but politically vulnerable brother. Robert had been the scientific director of the Manhattan Project during the war and was then occupied with the poisonous politics of America's postwar nuclear weapons development – politics which brought him down five years later. Robert knew that Frank had lied. Shortly after Frank and his wife joined the Party in 1937, he had told his brother, so when Robert was pressed by the House Un-American

Activities Committee in 1949, he had long known that Frank had been in the Party until late 1940, when he let his membership lapse.

So was Robert trying to protect Frank? During the war, Robert had already ‘named names’ to army security authorities. He had told military investigators in 1943 and 1944 about some of his students working on the Project, whom he described variously as ‘very much of a Red’, ‘quite a Red’, a ‘crazy person’ or ‘truly dangerous’. He had also apparently given security personnel the impression that an invitation to espionage had been made to Frank by one of Robert’s friends, Haakon Chevalier, a French literature professor at Berkeley who was acting as a go-between for a Soviet agent. This story about a Soviet approach – circulating and festering away – was one of the immediate occasions for the withdrawal of Robert’s security clearance in 1954. Who made the approach? To whom? What for? To how many people and how many times? What did Robert say to the intermediary? What was the delay between the event and Robert’s reporting of it? And why did his story change every time he told it? This was about Robert’s honesty as well as his loyalty: indeed, about inferring his loyalty from his honesty. In 1954, he testified that he had told a ‘cock and bull story’ about the Chevalier affair, but could not explain why he had done so, except that he had been, as he pathetically confessed on the stand, ‘an idiot’. Whether or not Robert ever fingered his brother – and historians remain at odds about this – by 1949 he must have known that the story was in circulation, and the last thing he wanted was to be questioned in public about his brother’s activities. So he suggested that if the committee needed to know whether or not Frank had been in the Party, they should ask him. Remarkably, the committee agreed not to press Robert; a subpoena to Frank had already been issued. Robert must also have known that, if and when Frank testified, he was going to admit to having been in the Party. (The FBI and army intelligence already knew and Robert knew they knew.)

As Frank set off for Washington days after his brother’s testimony, he left behind a letter of resignation from his position as a physicist at the University of Minnesota. He did this as a high-minded gesture, since he had been caught in a lie, and greatly valued honesty in all parts of his life. But he didn’t expect his resignation to be accepted. He had been a good physicist and a diligent member of the department. However, the university authorities seized the opportunity to rid themselves of a political embarrassment and the resignation was taken at face value. Frank Oppenheimer then began a decade in which he was, for all practical purposes, unemployable by any American academic institution, and the State Department’s refusal of a passport meant that he could not take up opportunities abroad. Frank was effectively blackballed; he was 37 years old and his career as a research physicist was over.

Frank’s life had been diverging from that of his more famous brother for some time, and now their paths truly separated. Despite the 1949 HUAC hearings, Robert retained his role as a government nuclear weapons consultant while serving since 1947 as the director of the Institute for Advanced Study at Princeton, where he was nominally Einstein’s boss. As

chairman of the General Advisory Committee to the newly created US Atomic Energy Commission, he did what he thought he could to limit the nuclear arms race, specifically arguing against the crash programme for developing the hydrogen bomb so enthusiastically promoted by his former colleague Edward Teller. That opposition, combined with continuing suspicion of his left-wing political affiliations before and during the war, led in 1954 to the AEC hearings, which resulted in the withdrawal of his security clearance. (Robert had flirted with joining the Party before the war, but for him theory never became practice. In his 1954 testimony he referred to himself as a politically naive ‘fellow-traveller’.) From that point, his life as a scientist-politician was over. Both brothers were now exiled from their callings.

Their lives in the wilderness were, however, very different. Robert carried on at the institute, enjoying – which is not entirely the wrong word – celebrity as a tragic icon of the American left. The purges had both damaged and purified him; his role as an expert adviser serving the national security state, and his betrayal of students and colleagues, were largely forgiven or forgotten. After the war, he had begun writing a series of elegant essays, decorated with learned allusions to philosophy and literature, reflecting on science, morality and the human condition, and now – stripped of political power – these reflections meant even more to him. The man Foucault once identified as a case of the ‘specific intellectual’ – a proto-technocrat – had in fact joined the intellectual class. He died of throat cancer in 1967 – a broken man, despite his celebrity. He had tasted power and life without it was no longer sweet.

In exile, Robert sank into despair and the search for the perfect martini, while Frank reimagined his life and, in 1969, founded the Exploratorium, a radically new sort of science museum in San Francisco, which he directed until his own death from cancer in 1985 and which has been called – with permissible exaggeration – ‘the most influential museum in the history of the world’, cloned and copied many times. Frank was happy to refer to himself – perhaps ironically – as the ‘uncle of the bomb’, but a life like his sets a biographer an awkward task. Do you write about Frank Oppenheimer as the brother of the father of the bomb, or do you direct attention to his special and distinctive contribution, ‘his own life’? K.C. Cole doesn’t ignore Frank’s relations with his brother, but her heart lies elsewhere. As a scientifically innocent young journalist, she met Frank a few years after the Exploratorium was established – at which point it isn’t clear she even knew of his past or whose brother he was. The meeting changed her life and she began a long-standing relationship with Frank. (She was taken on as a museum employee and eventually as a collaborator on an unfinished book collecting his thoughts about science, art and learning.) It’s this version of the man she’s interested in – his ‘own’ life and thoughts – and why not? The Exploratorium is a remarkable place. Cole is in no mood to adopt a disengaged view of her subject’s work there: her admiration for his integrity and wisdom is unrestrained, and when she discovered his few human failings – this most honest of men had affairs during both his marriages – she resisted believing it. As Cole disarmingly confesses, Frank was, to her, ‘a kind of Yoda’.

There is a lot to admire in what Frank Oppenheimer was and did. But celebration and understanding don't go together very well. Cole's biography doesn't help much in understanding what it was like to be this extremely complicated man, and it doesn't try to situate his life in the force fields of 20th-century American science and politics. We're given a docented tour through Frank's achievements and his thoughts about all sorts of things, but we don't get much of a sense of who he was. If you wanted to convey something of the feeling and the meaning of Frank's life, you might need to take more seriously where he came from and whose brother he was. The result would have been more rounded and, in a way, even more appreciative.

Robert always loomed large in Frank's life. There were just the two Oppenheimer children and their inheritance was an acute sense of taste, morality and intellectual earnestness – and quite a lot of money. The family fortune was built up by their father, who, having emigrated from Germany to New York in the 1880s, was in the business of importing suit linings. Their mother was a talented amateur artist and it was she who apparently picked out the Van Goghs, Renoirs, Derains and Picassos that decorated the apartment's gilded walls. The topics of dinner-table conversation were invariably Matters of High Import – music, art, literature, philosophy, politics. Both sons toyed with artistic callings before they settled on science: Robert wrote poetry (which he gave up); Frank played the flute (which he continued to do throughout his life). Robert, who was more pampered and demanding than Frank, was chauffeured everywhere: at school, it has been reported, he 'would not even use stairs, always preferring to wait for an elevator', but they were both indulged. Being an Oppenheimer was a serious business. Much was expected of the sons, but going into the family business was not part of it. They were secular Jews under the sway of Felix Adler's Ethical Culture humanism; motto: 'Deed, not creed.' The 'Judaism of the Future' was to be defined not by the laws of *kashruth* but by work to redress social inequities. The brothers were expected to 'do something' with their lives, something that both expanded the mind and Made the World a Better Place.

The brothers seemingly agreed that Robert – eight years older than Frank – should assume the role of a second father, and Robert happily played Polonius to Frank's Laertes. When Frank was 19, his brother – then already a physics professor – lectured him on the notion of vocation and questioned whether he was quite ready to decide on his authentic calling: 'By all means, and with my whole blessing, learn physics ... so that you understand it, and can use it and contemplate it ... but do not plan yet to "do" it: to adopt physical research as a vocation.' Before the war, physics was still more of a calling than a job. Robert knew he had a vocation, but he was not ready to acknowledge that his brother had one of the same authenticity and quality. Robert's sexual identity was problematic and sometimes painful to him, but he nevertheless offered Frank some confident advice – 'the fruit and outcome of my erotic labours' – about how to manage the flesh: 'Don't worry about girls, and don't make love to

girls, unless you have to: DON'T DO IT AS A DUTY. Try to find out, by watching yourself, what you really want.' The important thing was being honest, true to oneself.

Robert and Frank were like two peas in a pod – only they were like the peas in Mendel's genetic crosses, one smooth and one wrinkled. Robert's vocation took him to Harvard, Cambridge and Göttingen; Frank's less brilliant and focused talents took him to Johns Hopkins and Caltech, where his brother was already a star professor and where Frank went to work on his doctorate. They were both now physicists, but Robert was a theorist while Frank was an experimentalist, with an exceptional ability to take equipment apart, put it back together and jury-rig sophisticated physical instruments out of bits and pieces of junk. From his twenties, Frank was trying, as his brother reported, 'to establish an independent existence ... and didn't want in any sense to be my satellite'. His research was on cosmic rays; he devised detectors to be flown up to 100,000 feet by balloons, which occasionally had to be retrieved by slogging miles through Cuban jungle. Looked at from the outside, the Oppenheimers were in the same line of work, but perhaps no intra-disciplinary divide was more consequential than that between theorists and experimentalists in modern physics. Experimentalists sometimes (and only semi-facetiously) thought of themselves as intellectually honest – reporting on the world as they found it – while theorists were said to mould the world to fit their expectations. It was a relationship as productive as it was occasionally tense.

That relationship was broadly reproduced within the wartime Manhattan Project. Robert was a major force in orchestrating the gigantic development project, and theorists – while debating among themselves whether they were then doing physics or 'just' engineering – were later publicly celebrated as the heroes of the 'application' of pure science to produce powerful technologies. Frank's role, however, was as a talented fixer, who spent most of the war – at Berkeley and at Oak Ridge, Tennessee – helping in the less sexy but crucial development of technologies for separating fissionable uranium-235 from the vastly more abundant non-fissionable uranium-238. Frank modestly described his job to Cole as 'training people to fix what broke, redesigning things when necessary, and ensuring that no one slacked off on the job'. Robert only brought him to Los Alamos, the New Mexico centre of bomb design and assembly, a few months before the Alamogordo test in July 1945 – formally to act as a safety officer for the test but also, one feels, to be at his brother's side when Robert's work bore its strange fruit. They were lying down next to each other, flat on the desert sand, as the mushroom cloud climbed into the sky. And while Robert liked to recall that his first words afterwards were something profound from the *Bhagavad Gita* – 'Now I am become death, the destroyer of worlds' – Frank, as younger brothers will, remembered something less deep and noble: 'I think we just said: "It worked." I think that's what we said, both of us.'

The brothers had been drifting apart for years. Robert had intervened several times to assist Frank's career, but he was not totally impressed with his brother's abilities and he was

sceptical about the wholeheartedness of Frank's commitment to physics research. The 1954 security hearings hauled baskets of dirty laundry into public view, including Robert's feelings about Frank: 'He decided to study physics. Since I was a physicist this produced a kind of rivalry ... He worked fairly well at physics but he was slow. It took him a long time to get his doctor's degree.' Robert took two years for his PhD; Frank took all of four. 'He was very much distracted by his other interests.'

The most serious problem the brothers had was not about physics; it was about their wives. Frank got married first, in 1936, to Jacquenette Quann, a working-class French-Canadian woman, and it was Jackie who moulded his abstract Ethical Culture sense of social responsibility into political activism and then into joining the Communist Party. (A fellow physicist noted that she 'prided herself on being working-class and she had no use for intellectuals'.) Anti-Fascism, of course, drew many American intellectuals into the Party, but Jackie and Frank were most engaged by Pasadena's segregated municipal swimming-pools and African-American unemployment, so they clipped a coupon from the *People's World* (the Party paper) and mailed their application: 'It was that kind of casual thing,' Frank said. 'But then we became very active.' Frank didn't mind abstract political discussions but he now preferred to tackle injustices in their concrete and specific forms.

Robert's view of political activism was more theoretical. He didn't approve of Frank frittering away his scientific talents and he didn't approve of the wife who had led him into the Party. (Jackie and Frank got Robert to attend what he said was his one and only Party meeting, where the subject under consideration was desegregating that Pasadena swimming-pool. It was, Robert testified in 1954, 'a mixed unit of some coloured people and some who were not coloured ... It made a rather pathetic impression on me.')

This was, Robert thought, all Jackie's doing. She 'had a very different background to Frank', he said. 'She certainly interested him for the first time in politics and left-wing things. It was a great bond between them.' In fact, Robert couldn't abide Frank's wife. She was to him 'the waitress my brother has married'; he called their marriage 'infantile'; and he interpreted it not as the natural outcome of affection but as 'an act of emancipation and rebellion ... against his dependence on me'. So it's understandable that after Frank's marriage, as Robert testified, 'a good deal of the warmth of our relations remained, but they were less intimate and occasionally perhaps somewhat more strained ... We continued to be close as brothers are, but not as it had been before his marriage.'

Robert married four years after his younger brother. His wife's parents were German émigrés (not Jewish); they were prosperous; and they claimed descent from various European royal families. When Kitty met Robert, she had been widowed (a dashing Party member killed in the Spanish Civil War), had had her first marriage annulled (she had discovered that he was both a drug addict and a homosexual), and was unhappily married to a doctor. Kitty had herself been a Communist, but a posh and ostensibly well-bred one. Jackie couldn't stand Kitty. It

was about class resentment and it was about ideas of honesty and integrity. Kitty tried to define the sorts of people who were suitable acquaintances for her new husband; she improved the contents of the drinks cabinet; and she raised Robert's sartorial standards – though he already dressed much more snappily than Frank. 'She was a phony,' Jackie said. 'All her political convictions were phony, all her ideas were borrowed. Honestly, she's one of the few really evil people I've known in my life.'

After Frank was witch hunted out of physics, he and Jackie moved to southern Colorado. They had bought a ranch the year before with the idea of using it for summer vacations, but now they settled down to the business of raising cattle. 'This life is not what he was cut out for,' Robert told the security board in 1954. But in a way it was. Both Oppenheimers had roots in the land. From the early 1920s, Robert had sought to improve his health by spending time in the Sangre de Cristo mountains of northern New Mexico and southern Colorado, and eventually the family acquired a property and cabin near Cowles, New Mexico, which they cutely named Perro Caliente ('hot dog'). Both brothers figured themselves as Marlboro Men, physically brave, even foolhardy – though the riskiest thing both of them actually did was chain-smoke. They rode vast distances on horseback and acquired a love of the high desert that never left them. It was that attachment to the land that accounted for Robert's advice to site the wartime bomb-design facility in nearby Los Alamos. Frank's 800 acres were near Pagosa Springs, about four hours' drive north of Cowles and also in the Sangre de Cristos. In a telling gesture of alien belongingness, the ranch was bankrolled by the sale of a painting Frank had inherited, Van Gogh's *First Steps (after Millet)*, leaving him with only a Blue Period Picasso – later sold for over \$1 million – and some other good things.

Frank had not in any way wanted to leave physics, but it was in Colorado that he found both the purity and the practicality he had always valued; and though he was intermittently depressed, the ranch years, he told Cole, were 'a wonderful time'. The cosmopolitan had surprisingly found a local home. He did not know much about cattle, but he was an eager learner, and his mechanical skills now turned out to have a value outside the laboratory. The neighbours were understandably suspicious. The newcomer was not exactly the kind of person they were used to: a New York Jew and ex-Communist who received visits from the FBI still trying (and failing) to get him to name names. But Frank believed (as the saying has it) in acting locally while thinking globally, and he soon became an indispensable political presence in the local cattlemen's association, the soil conservation board and the telephone company. And he didn't give up interest in national and international politics, but fired off streams of letters to newspapers about the sorts of issue that involved his brother as a compromised actor in the corridors of power. Cut off from the places where consequential political decisions were made, Frank was now able – as Robert was not – to achieve a purity of perspective about what was right and wrong in the post-Hiroshima world. He too began to write essays – less elegant but more passionate than his brother's – about science, morality

and the human condition.

The tiny high school in Pagosa Springs needed a science teacher, and Frank offered himself. He didn't have formal teaching credentials, but he got them through correspondence courses. He didn't know much about the sciences apart from physics, but he quickly made up the deficit and taught biology and chemistry too. Most of the neighbours had got over the Communist thing, but Frank had the balls to face down those who hadn't. He had become, in an odd way, one of them, lighting his cigarettes with wooden matches struck on a silver Western belt buckle. Schoolteaching was also something that Robert thought Frank was not 'cut out for', but he was wrong. Frank turned out to be a brilliant and inspiring teacher. His students, sometimes from seriously disadvantaged backgrounds, won all sorts of science prizes and some went on to distinguished careers. Years later, one became a Nobel Prize winner in economics; he recalled Frank as a 'guy ... from another planet', a benign and charismatic alien: 'We devoured the physics and we devoured the man ... I've never known anyone quite as gentle, as understanding ... There was an intensity I'd never seen before. He was so curious!'

His metier was, indeed, teaching not research. In 1959, Frank re-entered academic science at the University of Colorado, but the world of physics had changed in his absence. It had become, in his view, more competitive, more businesslike, less curiosity-driven, less of a calling and more of a job. His students, Frank thought, seemed to have 'lost their curiosity': 'They just wanted to know how to pass their tests.' Science teaching was a calling, but schools and universities were not, in his view, doing it properly; indeed, they were destroying young people's innate drive to explore and to understand. Cold War physics research had become, in Frank's harsh judgment, 'an intellectual desert', and the remedy was to return science to its sources in childlike curiosity. The Exploratorium was meant to be where that happened.

'No one flunks a museum,' Frank repeatedly said, and the Exploratorium was conceived as a place where people could learn about the world without any possibility of failing. It's hard to describe the Exploratorium, but impossible to miss the dialect of the Flower Children in Frank's attempts to do so: 'a museum of human awareness'; 'a place where people could build their own personal repertoires of images and experiences'; 'a woods of natural phenomena', containing 'all manner of wonders'. He liked the idea that teenagers would come to the Exploratorium to get high. The museum occupies a huge hangar-like space in which the black box of textbook science is opened up, its inner workings exposed. The workshop for making equipment and displays is front stage, and children run around unrestrained, since, insofar as there are lessons to be learned, they are that people cannot make mistakes, that what seems to be either pointless play or screwing-up is in fact learning, and that scientific research itself is an adventure in making mistakes before any provisional truth is found. A science museum 'shouldn't be pretty and under glass', Frank said. 'The visitor should learn that experiments break, and fail, and you've got to fix it. Workshops should be part of the museum. Because

that is the way that physics is done.’ Mostly, play results in nothing at all, but so what? ‘Occasionally though, something incredibly wonderful happens.’ So the Exploratorium was carefully designed as an undesigned place, a place where people could notice stuff and then take their noticing to the next stage. There are optical phenomena to be noticed, puzzled at, explored and explained; displays illustrating the pervasiveness of resonance phenomena; explorations of perception and its modes; installations breaking down the conventional boundaries between what is seen as science and what is seen as art.

Frank’s conception of human nature and human curiosity was breathtakingly romantic. Everyone by nature wants to know, he believed, and if they seem not to want to know, that is because the ‘shades of the prison house’ have begun to close on them. Schools had stifled them. The Exploratorium was not a school, but it was what a school ought to be. Give people a place in which curiosity can take its natural course and they will follow their curiosity. They will become smarter – and they will become better. And here the guiding impulse was not so much romanticism as 20th-century American scientism. If, for example, you understand perception and misperception scientifically, you may come to understand the bases of social injustice. If you learn to think like a scientist and investigate things for yourself, trusting no one, you will bypass the liars who misrepresent reality and find truth yourself. To be a good American citizen was to be a proto-scientist. It annoyed Frank that camera manufacturers didn’t include small lenses in the boxes, together with a pamphlet explaining how lenses worked: then every camera-user would know the physics of taking a picture and become ‘masters of what they are doing’. If people thought like scientists, they could protect themselves from the problems of inequality, war, crime and racism – ‘just as vaccines protect us from disease’. Curiosity was supposed to be full-time, and the undeniable practical benefits of letting much of one’s transactions with the world be black-boxed were of little interest to him.

Once Frank explained all this to his biographer, the scales fell from her eyes, and she realised that, ‘at its core, the Exploratorium was a political institution.’ Frank really believed that scientific curiosity drove everyone as it drove him, and he really believed that scientific curiosity unleashed and satisfied would have enormous moral consequences. It was the Ethical Culture sermon refracted through the lenses of scientism and populism. The Exploratorium was an institution made in Frank Oppenheimer’s image – childlike, silly, naive and, ultimately, quite wonderful.

It’s impossible to know what his brother would have made of all this. Robert died just at the point when Frank began to think about what a new sort of science museum might be and might achieve. At the time of his death, Robert presided over a community of professors with no students, while Frank had imagined into being a community of learners with no professors. Frank recalled that, after the war, he and his brother argued about science and politics, in some instances with ‘a real sense of outrage with each other’. Robert was growing more

melancholy, more cynical and more pragmatic. He was also falling out of physics: after the war, he published five short scientific papers, and, after 1950, none at all. He had been so able at so many things that he never did the One Big Thing that caps a calling. 'He didn't have *Sitzfleisch*,' the patience to see something all the way through, the physicist Murray Gell-Mann remarked.

Robert now cautioned against the idea – increasingly influential in Cold War America – that scientific knowledge and scientific method could be exported to solve any number of social problems: 'Science is not all of the life of reason; it is a part of it.' He was sceptical of the idea of 'social responsibility', suspecting that the injunction to scientists to produce good rather than bad things was meaningless, 'little more than an exhortation to the man of learning to be properly uncomfortable'. And, especially, he did not believe that people could come to understand science by any means other than doing scientific research themselves. The experiences of science were in principle open to anyone, but only on condition that they became scientists. Frank's reply to his brother was the museum. Frank had found his calling; Robert had lost his.

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Vol. 32 No. 18 · 23 September 2010 » Steven Shapin » Uncle of the Bomb (print version)  
pages 12-14 | 5009 words