

Engineering Communism: How Two Americans Spied for Stalin and Founded the Soviet Silicon Valley

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I'd like to start out by telling you how I came to be here, the circumstances around my writing *Engineering Communism*, how I befriended Joel Barr and how that relationship revealed an unusual and little-known Cold War espionage story that played out on both sides of the Iron Curtain. I'll discuss some new insights into the Rosenberg spy ring stemming from an examination of Barr's life and that of his close comrade, Alfred Sarant; tell you about some of the more intriguing personal aspects of the story; and conclude with some ideas about the relevance of this kind of Cold War experience for today's fight against terrorists.

My goals in writing *Engineering Communism* were to tell an incredible story, but beyond that, to describe why Barr became a Communist and a spy. His background and motives were similar to those of other members of the Rosenberg ring and to others who spied for the Soviet Union in the 1940s, so his story provides broad insights.

As I researched the book, it became clear that the success of the Rosenberg ring was made possible by major counterintelligence failures. Reading the FBI files is like watching one of those old Western movies where you can see the bad guy crouching behind a rock while the good cowboy walks unaware into the ambush. You want to yell "Look out!" Because the Bureau clearly had all of the information it needed to put Rosenberg, Barr and their comrades out of business long before they had stolen any useful information, but it failed to connect the dots.

Finally, I wanted to use Sarant and Barr's experiences behind the Iron Curtain to give some insight into why the Soviet Union failed to develop the level of high technology that its scientists and engineers were clearly capable of producing.

My first step toward this podium was a meeting in September 1990 in Moscow with an American investment banker. I was visiting Moscow researching articles on Soviet technology and he was doing tech transfer deals. When I asked him for referrals to Russians with promising technology he suggested that return the next day to meet an engineer named Joseph Berg, a Russian, he said, who spoke flawless English and had invented a novel technology for small-scale custom integrated circuit manufacturing.

As soon as Berg opened his mouth it was obvious to me, if not the banker, that he was about as Russian as Bugs Bunny, who's voice and demeanor he shared. When I asked Berg how he came to speak English so well, he said "we have good schools here." I pointed out that no school could produce such a classic Brooklyn accent and Berg reverted to his backup story, explaining that he'd grown up in a neighborhood in Johannesburg with a lot of Americans. This didn't seem credible, but I'd been in Moscow for a couple of months and had run into quite a few people who had equally incredible personal stories. The Soviet system was crumbling but it wasn't clear what would replace it, so a lot of people who were scrambling to remake themselves as they prepared for an uncertain future told stories that didn't add up.

After an hour of very animated conversation, Berg invited me to lunch at a hotel near the Kremlin and then offered to let me accompany him to the see a place he said that very few Americans had set foot in, a city he described as Russia's Silicon Valley. A government sedan drove us 45 minutes to Zelenograd, a once-secret city of 200,000 people, entirely dedicated to the design and production of microelectronic components and computers. We stopped in front of this building, the Scientific Center, which Berg explained was the nerve center for the Soviet microelectronics industry. Berg didn't say anything about his connection to Zelenograd.

I accepted Berg's invitation to visit him in Leningrad the next weekend. He met me at the train station and brought me to what was undoubtedly one of the most unusual apartments in Soviet Russia. At that time millions of Russians lived in apartments that were identical not only on the outside – the familiar 5- and 9-story cookie cutter

buildings -- but also varied very little in their internal design and furnishings.

In Berg's apartment most of the walls had been smashed to form a huge room, which featured a huge pre-revolution grand piano in the center; the bathroom and kitchen featured odd handmade Rube Goldberg contraptions. That evening Berg hosted a concert by musicians from the Leningrad Conservatory attended by about 50 people, mostly scientists and engineers.

About three months and several musical evenings later, I learned that Joe Berg had another identity, that he was Joel Barr, an associate of Julius Rosenberg's who had left the United States in 1948 and fled behind the Iron Curtain in 1950.

Barr and I remained close friends over the next eight years. He lived in my house in Washington for weeks at a time and we talked a lot about his early years, his life as a secret Communist in the 1940s, and his adventures in Czechoslovakia and the Soviet Union. We started on his memoirs several times, but never got far. After his death in August 1998, I pieced together much more of his story using the thousands of pages about him and his associates that the FBI has declassified, formerly top secret archives released by the Czech Republic, Barr's papers, and interviews with his family, mistress, colleagues and comrades.

Joel Barr was born in Brooklyn on New Year's day 1916, the second son of struggling Jewish emigrants from Ukraine, which was then part of the Russian Czar's empire. His family was poor before the market crashed in 1929, shortly after his bar mitzvah; they were destitute during the Depression. After two evictions, the family ended up in a tiny unheated apartment with no running water, next to elevated trains that ran day and night. They lived on relief and charity. Like many of their neighbors, the Barrs found the Communist explanation for their predicament convincing. The idea that a small group of rapacious capitalists ran the country for their own benefit, that democracy was a sham, and that corporations and the government colluded to oppress ordinary people, seemed entirely plausible to them.

Barr enrolled in City College of New York, CCNY, in February 1934. As Barr later told me, there were a lot of good reasons for selecting CCNY. First of all, it was free – and, well, since his family was broke, the other reasons didn't matter. At a time when many colleges and universities had unwritten, but very real, restrictions on Jews, CCNY was open to everyone. It was also easily the most radical campus in America. Like other schools, there were two dominant political factions at CCNY, but they weren't Democrats and Republicans, they were Stalinists and Trotskyites. The faculty, which was at least as radical as the student body, started publishing an underground Communist newspaper, *The Teacher and Worker*, in Barr's second year at CCNY.

Barr joined the Stalinists, who were in the majority, spending much of his free time in an alcove in the cafeteria semi-officially dubbed *The Kremlin*, whose occupants spent hours dissecting and discussing the finer points of Marxism and Leninism, and arguing with the followers of Trotsky in the adjacent alcove, depicted in these illustrations from CCNY's 1936 yearbook.

Barr met Rosenberg in the CCNY Kremlin and joined the Steinmetz Club, a chapter of the Young Communist League that Rosenberg created for electrical engineering students. Rosenberg and his comrades contrasted the realities of life in America – the only life they had ever known was poverty, the Depression, anti-Semitism – with a romantic notion of Soviet life, based on propaganda films and magazines. As students of electrical engineering they also believed in technology, and were firmly convinced that the only way to unlock its power was to create a Soviet States of America. They also fantasized about picking up and going to the USSR after graduating, although the farthest any of them had ever gone from Brooklyn was Camp Unity, a Communist summer camp 75 miles away.

Barr graduated in June 1938. Rosenberg, who was far more diligent about politics than academics, barely managed to get his degree six months later. In early 1939, both joined the Communist Party. It was the zenith of Communist respectability in America. Barr and Rosenberg attended packed Party meetings at Madison Square Garden and Earl Browder's speeches were broadcast nationwide on the radio. As part of the Popular Front strategy, Communists

pretended to believe in democracy and ran candidates for political office. On August 9, Barr signed a petition nominating Peter Cacchione for City Council under the banner of the Communist Party. Here's a copy of the Cacchione petition dated August 13 with Ethel Rosenberg's and her friend Stella Pogarsky's signatures. Ethel Rosenberg's and Joel Barr's signatures on these petitions came back to haunt them a few years later.

A week and a day after Ethel Rosenberg signed the nominating petition, her world and that of every other American Communist was shaken to its foundation by the news that the Soviet Union had signed a treaty with Nazi Germany. The Popular Front mask was ripped from the CPUSA's face, revealing the party's subservience to Moscow. Many of Barr's friends recoiled in horror, but he, the Rosenbergs and several of their Steinmetz Club alumni stuck with the Party.

Barr found a job in Washington with the Civil Aeronautics Authority as a draftsman, but he didn't like the work or the Nation's Capitol, and he quickly landed a job that held much more promise, as an engineer at the U.S. Signal Corps Laboratory at Fort Monmouth, New Jersey, working on a new, secret technology: radar. Rosenberg also landed a job with the Signal Corps, as a quality control inspector. Several of their Steinmetz Club pals were also swept up in the early efforts to gear the military up for the coming conflict.

While defense work was technically interesting, it placed Barr and other Communists in a difficult position, helping America to arm Great Britain and readying the country to fight in a war that as Communists they adamantly opposed. They attended anti-war meetings at which Roosevelt and Churchill were vilified. Julius conceived of a way out of the dilemma, a solution that would allow them to work for the imperialist warmongers while remaining true to their Communist ideals. The answer was staring them in the face every day: the blueprints and manuals they worked with could be of great value to the Soviet Union.

From the point of view of a foreign intelligence service seeking to acquire military technology, there were few better places in the United States to have agents than in middle-level jobs at the Signal Corps

and its contractors. With the exception of the atom bomb--which didn't alter the course of the war in Europe--most of America's most important World War II weapons systems were developed or refined at Fort Monmouth and manufactured according to Signal Corps specifications. The "SCR" (Signal Corps Radio) designation was stamped on the walkie talkies that G.I.'s carried on battlefields around the world; on the machines that allowed airplane pilots to peer miles ahead, thereby turning Hitler's submarines from terrible predators to terrified prey; on the contraptions that transformed the V1 "buzz bombs" launched against Britain from lethal weapons into sitting ducks; and on the high tech artillery shells that turned the tide against the Nazis' last offensive at the Battle of the Bulge. These weapons or their precursors, along with numerous more mundane but still vital components, were under development during the period when Barr, Rosenberg and their collaborators had access to classified Signal Corps information.

Security was lax, so there was no problem obtaining and "borrowing" classified documents – at least one Nazi spy managed to wander into Fort Monmouth and spend several days collecting intelligence, completely undisturbed. But finding a secure way to communicate information to Moscow presented a more difficult challenge.

Rosenberg approached Party members seeking someone who could pass military secrets to the Russians. One of the men he turned to as a potential intermediary was Abraham Osheroff, a wounded veteran of the Abraham Lincoln Brigade. The timing of Rosenberg's approach to Osheroff is quite significant in light of the argument put forward by some apologists for the Rosenberg ring that they were merely helping an ally. It was before June 1941, Osheroff later told one of Julius Rosenberg's sons. This means that Rosenberg was proposing to commit espionage at a time when the Nazi-Soviet Pact was in force. He didn't start on the path to becoming a spy with the goal of helping an American ally, or necessarily of fighting fascism. Before either the USSR or the U.S. was at war with Germany, he considered himself a partisan fighting behind enemy lines--that is, in the United States-- on behalf of Soviet Communism. To Rosenberg and Barr, Stalin's alliance with the United States during the Second World War was a matter of convenience, a temporary expedient, much as its prior alliance with Germany had been. They were eager to do anything

they could to help the Soviet cause—before, and as you will see, during and after the war against Hitler.

When he started providing classified information to Rosenberg for delivery to the KGB, Barr knew that Moscow's policies were in conflict with Washington's, just as he knew in later years that his contributions to Soviet military technology could put the lives of U.S. soldiers in jeopardy in Korea, Vietnam and elsewhere. This knowledge never caused a moment's hesitation. Barr would take tremendous personal risks and do everything possible for the Soviet Union, not out of animosity to the U.S., but driven by the belief that Communism represented the best hope for humanity. The only sovereign socialist country must be preserved at all costs, he and other American communists believed.

Sometime before the end of 1941, Rosenberg's inquiries about Soviet intelligence brought him to the attention of Bernard Schuster, a senior CPUSA official who acted as a liaison between Soviet intelligence, which assigned him the cover name "Chester," and Party members, including Earl Browder. Schuster introduced the Signal Corps inspector to Jacob Golos, a Russian émigré who was a founding member of the American Communist Party and a Soviet espionage operative. Golos, who operated a travel agency specializing in trips to the USSR as a cover, had already come to the attention of the Justice Department after the FBI identified him as the source of forged documents that Browder had used to travel to Moscow. In March 1940 Golos was indicted for failure to register as a foreign agent. Although the Attorney General publicly branded Golos as a Russian spy and the FBI briefly put him under surveillance, with the assistance of his lover, Elizabeth Bentley, he managed to continue to run an extensive group of agents and to play a role in Trotsky's assassination. Clearly, if someone who practically wore a sign on his back identifying him as a spy could continue to function at a high level, there was something seriously wrong with U.S. counterintelligence.

Golos operated in a kind of grey area, half way between being an agent and an officer, and his tradecraft was pretty sloppy. His handling of Rosenberg was typical. Rosenberg arranged face-to-face

meetings with Golos by calling Bentley very late at night, identifying himself as “Julius.”

A KGB document indicates that from the start of his relationship with Golos, Rosenberg was collecting information and party dues from four other engineers. One of them must have been Barr.

Meanwhile, the FBI was actively attempting to identify and root out Communists from sensitive jobs. Especially after the Nazi-Soviet pact, most Communists in government positions hid their party affiliation. They could not, however, hide public documents in which they had identified themselves with the party.

In the spring of 1941, the FBI correlated Ethel Rosenberg’s signature on a nominating petition for Cacchione with her husband’s employment, as well as their close association with known communists. Julius hypocritically and histrionically defended himself, claiming that he wasn’t a communist, and he kept his job.

Rosenberg’s idea to spy for the Soviet Union doesn’t set him apart. It was common for communists at that time to think about espionage – they romanticized the Bolshevik’s clandestine origins and were fed a constant diet of conspiracy in the Daily Worker. Someone who was close to Barr while they were at CCNY, who left the party over the Nazi-Soviet pact, told me a story that illustrates this. He paid an unannounced call on Barr late one evening when Barr was working at Fort Monmouth. After knocking on the door, as a joke, he said in a deep voice “FBI, Open Up!” Then he stood there and heard the sounds of utter pandemonium coming from inside the apartment. Furniture being moved, the toilet flushing several times, and indistinct scurrying about. Finally Barr opened the door, flushed, sweating and not at all amused. The person who told me this story said he had no doubt at the time that Barr was engaged in espionage.

In December 1941 an FBI screening program matched Joel Barr’s signature on the Cacchione petition with position at Fort Monmouth. The FBI passed the information to the Army, which unceremoniously fired Barr and placed his name on a list of unemployable security risks. This could, and should, have been the end of Barr’s career in military electronics and as a Soviet spy. But it was just the beginning.

Barr's firing was widely discussed at Fort Monmouth – scores of his colleagues signed petitions asking that he be reinstated. When word was circulated that he was fired because of connections to communism, many of the engineers scratched their names off or tore up the petitions.

Despite the notoriety surrounding his departure, Barr was hired within two weeks by a defense contractor. Western Electric didn't make any effort to check Barr's references, didn't call his supervisors at Fort Monmouth, and there was no formal procedure for vetting new hires with military counterintelligence or the FBI. Soon he was working with far more sensitive technologies, the most advanced radar and analog computer systems in the world.

FBI agents in New York and Washington batted memos about Barr back and forth, but no effort was made to investigate him and the FBI had no idea where he was working.

Meanwhile, the KGB had transferred control of Rosenberg from Golos to a young, talented career officer named Semyon Semyonov . Semyonov had earned a masters degree from MIT, could pass for an American, and was very well liked by his agents. He quickly put the Rosenberg ring on a more professional basis, convincing Julius to cut visible ties to the Party but allowing him to organize a secret cell, Branch 16B of the Industrial Division. Barr joined, as did his close friend, Alfred Sarant.

Barr met Sarant, also an electrical engineer, at the Signal Corps and developed a very close friendship with him. A couple of months after Barr was fired from the Signal Corps Sarant was also terminated, for attempting to recruit Army civilian employees into a trade union. He had no difficulty obtaining a position at Western Electric that, like Barr's, afforded access to advanced radar technology.

During the summer of 1943 the FBI began to understand that the Soviets were spying on military technology and it targeted some Russian trade officials and diplomats for surveillance, including Semyonov. He broke off contact with agents, including Rosenberg. Desperate to continue spying, Rosenberg called Elizabeth Bentley,

who passed a message to Golos, who in turn relayed the message to the KGB's New York *rezidentura*. Rosenberg was turned over to a young KGB officer, Alexander Feklisov, who has described his actions in a memoir and in television interviews.

Worried that Rosenberg was taking unnecessary risks, Feklisov convinced him to cancel subscriptions to the Daily Worker and other Communist publications, to avoid attending public events associated with the Party such as Red Army rallies, and to disband Branch 16B. Even after he went underground, Rosenberg met Bernard Schuster, the Party's primary liaison to Soviet intelligence, monthly to pay dues. It wasn't enough for him to risk his life to give the USSR priceless military secrets, Rosenberg also felt compelled to contribute financially. The Communist Party paid a great deal of attention to bureaucratic formalities, and all of the members of Branch 16B were officially transferred to other organizations and the transfers were duly recorded.

The FBI obtained these transfer records, most likely by illegally breaking into a Party office, in March 1944. Incidentally, the membership secretary was Viola Shore, grandmother of the actress Dinah Shore.

Thus, in spring 1944 the FBI had a list of most of the members of Rosenberg's ring. And as you can see from this document, it had already opened an investigation of Barr captioned "Security Matter – C" for communist.

In addition to meeting with Rosenberg, Feklisov met directly with Barr, and a few months after the FBI obtained this list of Branch 16B transfers Feklisov convinced Barr to recruit Sarant. Barr moved in to Sarant's Greenwich Village apartment, which they used as a studio for microfilming blueprints, manuals and other documents. Here is Barr on the roof of the apartment, then Barr and Sarant together.

I'll come back later to some details of the technology they gave to Feklisov – it was quite valuable. A key fact is that much of the most important technology transfer occurred after March 1944 -- after the FBI had all the evidence it needed to shut down the Rosenberg ring.

In the fall of 1944 the FBI acted on its information about Julius Rosenberg's communist party membership, notifying the Army, which fired him. As with Barr, this didn't put much of a dent in Rosenberg's career. The FBI made no effort to track him and was unaware that he was promptly hired by a defense contractor. The KGB was worried, however, and it told Rosenberg to break off contact with his comrades and to stop spying. Barr and Sarant continued their efforts, however.

Information about Rosenberg's co-conspirators kept accumulating in the FBI's files. In February 1945, the Bureau obtained a copy of a party file card on Alfred Sarant, noting his party name (Raymond Cooper) and address. It did nothing with the information.

In October 1945 Barr quit his job at Western Electric and enrolled in an Electrical Engineering Masters degree program at Columbia University. In a KGB version of the GI Bill, Soviet intelligence paid Barr's tuition and provided a monthly stipend of about \$50. Sarant went to work at Bell Laboratories on some early computer technology.

Freed from late-night microfilming sessions, Barr turned his attention to music, teaching himself to play at the piano at a semi-professional level and studying composition with Elie Siegmeister, a prominent figure in American music at the time who was a very active communist.

After receiving a masters from Columbia, Barr went to work at Sperry Gyroscope Company in October 1946, working on a top secret Air Force program involving long-range radar. At about the same time, acting on his own and against the KGB's instructions, Rosenberg re-launched his espionage career, gathering information from Barr and other contacts that he planned to pass on to the Russians.

By June 1947 security procedures had tightened up a bit and Sperry contacted the FBI for information about Barr. The Bureau quickly discovered that the Signal Corps had fired him as a communist five years previously, and it launched an investigation. It interviewed two of three references Barr had provided Sperry, but they didn't know him well and provided no useful information. They never contacted the third reference, Julius Rosenberg. In September 1947 the FBI

delivered a file on Barr to Sperry. The company fired him in October, after he'd worked on the Air Force project for a year. It told him the action was a response to his lying about the reasons for his termination from the Signal Corps in 1942; it didn't mention that the FBI also knew that he was still a party member.

Figuring that his career was over, Barr sold all of his belongings, collected some cash from his Russian friends, and made plans to travel. He told his girlfriend, Vivian Glassman, that he planned to try to visit the Soviet Union to get a first hand look at communism, and told others that he would be studying music with Sibelius in Finland. On January 21, 1948, Barr sailed to Europe, stopping first in Paris, proceeding to Stockholm, then on to Finland, and back to Stockholm where he studied electrical engineering.

Barr remained in contact with the KGB, which used classic tradecraft to arrange covert meetings. Apparently afraid that he'd forget the detailed logistics of these meetings, Barr jotted down some notes in a shirt pocket sized address book which I found after his death. Some of the notes about Barr's meetings with the KGB were clearly written in Europe; it is possible that some were written earlier, when he was still in New York.

Some of the notes describe a method the Russians used to notify him of a meeting date. An advertisement, probably in a newspaper left for him at a dead drop, would be circled. He was to add three to the number to get the date of the meeting, or as the note says, 22nd, then 25th. Another note suggests that a news item with a date would be indicated and three days would be added to the date to establish the meeting date. KGB courier Harry Gold told the FBI about very similar procedures. The notes also include a classic recognition sequence, again very similar to those described by Gold, as well as a set of instructions that seem to refer to a meeting on a bridge in Paris.

On July 4, 1949, Barr arrived in Paris and convinced Olivier Messiaen, a world famous composer, to accept him as a student. This gives you an idea of Barr's character and self-confidence. Very few people with absolutely no formal training would have the nerve to approach someone of Messiaen's stature with such a request, and even fewer would receive a positive response.

While Barr was traveling in Europe, based on leads generated by the Venona program, his name was back on the FBI's radar. Following up on a lead from Venona, the Bureau launched a for a Communist engineer spy who had worked for the Signal Corps. Trying to track down the identity of an agent with the cover names Antenna and Liberal – who it eventually worked out was Rosenberg – attention initially focused on Barr. When it learned he was in Europe, the FBI turned its attention elsewhere. Venona had, however, both woken the Bureau up and given it crucial leads.

The Soviets were well aware that the FBI was closing in and they made some efforts to get the Rosenbergs and others out of harm's way. At one point Julius told his brother-in-law David Greenglass that he should go to Paris, where he'd be met by someone who could help him on his way to the Soviet bloc. This might have been Barr. When Greenglass complained that the State Department would never give him a passport, Julius told him that "they let other people out who are more important than you are...they let Barr out."

The arrest of Klaus Fuchs in the UK, and subsequent arrests of Harry Gold and then Greenglass in the U.S., as well as the importance of the Venona decrypts for the investigations and for confirming their guilt has been well documented, so I won't go over it again. Ron Radosh, Harvey Khler, John Haynes and Nigel West have all written extensively and authoritatively on these topics.

Barr had been preparing to depart Paris for some time. On June second, 1950, he ran into Sam Perl on the street. He told Sam, the brother of Bill Perl, one of the most productive members of the Rosenberg espionage ring, that he was leaving but refused to say where he was going.

Two weeks later Greenglass's arrest was announced in the newspapers. The next morning, Barr walked out of his apartment carrying a single bag, with a viola slung over his shoulder. As far as subsequent FBI and CIA investigations could determine, he vanished at this moment. For more than three decades, no one in the West knew where Barr was, or even whether he was alive or dead.

In fact, Barr boarded a train to Switzerland. He laid low in Zurich for a few days and then took a train to Prague. KGB men met him there and brought him to the Regina, a hotel close to the station that still exists. One of the first orders of business was setting Barr up with a new identity. His Russian friends warned him that contacting anyone from his past would endanger both his safety and theirs. They asked him to pick a new birthday, one that he could easily remember, and he chose October 7, 1917, the day his younger brother Arthur was born. They gave him a new name, Joseph Berg, and birthplace, South Africa. The name was a little KGB joke: he was Joe Berg from Jo'burg. Berg rehearsed his legend over and over, keeping a scrap of paper in his pocket with key dates and studying it in spare moments. A memo written by the Czech secret police, the STB, in 1951 mentions him referring to the paper during an interrogation.

Incredibly, that piece of paper still exists, I found it tucked inside his address book, exactly as the STB described. It has his parents' legendary birthdates, the dates they arrived in South Africa, Berg's progression through South African schools, his travel to Canada where he supposedly worked on radar projects during the war, a brief stint in Paris and travel back to South Africa. He was instructed to say that he'd come to Czechoslovakia to trace his parents' roots and to look for work. Interestingly, and typical of Barr, on another page he also noted the real dates for his travels, his parents' actual birthdays, his father's death, and the birthday of Robert Rosenberg, the eldest child of Julius and Ethel. He even recorded the date of his last time he'd had sex – the night before leaving New York, which Vivian Glassman told me he spent with her.

The Russians continued to run Berg as if he was in a foreign, if not hostile, country, meeting with him covertly. As before, Barr jotted down reminders of the meeting logistics in his address book. His address book includes a note about arranging meetings at the Staro Clock, as usual three days after the date in some kind of indicator. Staro means "old" in Czech, and this is a reference to the Astronomical Clock in the Old Town Square. Another note mentions telephoning someone who only speaks Czech and Russian – a good clue that this was a Russian, because in 1950 there weren't a lot of Russian-speaking Czechs – and say in German "mein name Joe." This would trigger a meeting the next evening at the clock.

Alternatively, someone else could set up a meeting by slipping a paper under his door. Later he noted a new twist – if the meeting didn't come off as planned, it would be repeated a week later.

Barr learned to speak passable Czech in a few weeks – he had a real talent for languages – and his Russian friends introduced him to their associates at the Czechoslovakian secret police, the StB. The StB pulled some strings and got him identity papers and a job doing engineering work for Tesla, a state-owned enterprise that made radios and telephone equipment.

In June 1951, almost exactly a year after arriving in Prague, Berg was approached at work by an StB officer who told him to go home immediately and wait there for instructions. A Russian showed up and gave him a visa and an air ticket to Moscow, leaving the next day. He told Berg that he was going on an unspecified “technical mission” that would be revealed in Moscow.

Berg's plane was met by a driver who claimed that he didn't speak English and they drove in silence into Moscow, stopping within sight of the Kremlin at the Moskva Hotel. He gave the clerk his Czech documents and was given a room key, rode up the elevator, opened the door and was amazed by the scene. His old friend, Alfred Sarant, was standing there, and a pregnant woman was sitting on the bed. Sarant was as surprised as Barr. The KGB had, of course, arranged the dramatic reunion.

Sarant and the woman, Carol Dayton, then described how they came to be in Moscow. It started on the afternoon of July 19, 1950, when two FBI agents knocked on the door of Sarant's house in Ithaca, New York. By this time Julius Rosenberg had been arrested and the Army Security Agency had only a month earlier decrypted a critical portion of a Venona document indicating that Sarant had been a Soviet agent.

Sarant allowed the FBI to interrogate him, to remove items from his home, and take mug shots. He admitted to knowing Barr, Rosenberg, and the physicists Hans Bethe and Richard Feynman, as well as his next-door neighbor and friend, Bruce Dayton. Another physicist friend, Philip Morrison, lived across the street. Sarant told the FBI that

Rosenberg had felt him out about spying, but claimed he didn't bite. After a week of interviews, during which the FBI pressed him to confess to espionage and challenged inconsistencies in his stories, Sarant was desperate. He hatched an escape plan and recruited his next door neighbor, Carol Dayton, as an accomplice. Bruce and Carol, both married with two young children, were having an affair.

Sarant told the FBI that he was going to visit his father on Long Island. The FBI followed him to Long Island and kept a loose watch on him. A few days later Carol left Ithaca, telling friends that she was going to Boston to look for housing because her husband Bruce had been received a post doctoral appointment at MIT. She took a bus to New York, where Sarant met her. That evening they went to the race track, where Sarant's sister and brother-in-law kept horses. FBI agents were watching the exits, but they didn't notice that Al and Carol slipped out through the paddocks, got into his car and drove south. A series of FBI memos record a keystone cops scenario in which the Bureau didn't realize Sarant was missing for six days. By the time they figured out that he and Carol had driven to her uncle's house in Arizona and then crossed the border into Mexico, the couple had a head start of almost three weeks.

Originally Carol had planned to see Al to the border and then return to her husband and two kids, but she just kept going. She spoke Spanish fluently, which helped the couple keep a low profile as they kept on the move, never spending two nights in the same place, until after two months they landed in Mexico City, nearly broke. They set out one morning for the Soviet embassy, but were spooked at the last minute by a car circling the building that they thought was the FBI. Instead, Sarant got the idea to approach a Polish trade office. He and Dayton announced to the Poles that they were on the run from the FBI and said they "wanted to help build socialism." Sarant's intuition was correct; the mission was a cover for Polish intelligence.

Ironically, another member of the Rosenberg ring, Morton Sobell, had made his way to Mexico and visited the same Polish trade office a few months before. He only enquired about ships to Europe, however. The Mexican police and FBI tracked him down and escorted him to the U.S. border, where he was arrested and tried along with the Rosenbergs.

The Poles, acting on instructions from Moscow, kept the couple hidden while they worked out an escape plan. Early on, Carol announced that she'd had enough and that she was going to hop on a bus and go back to her two kids and husband. The Poles persuaded her, however, that she would be headed for a jail cell, not the embraces of her family, so she stayed. After six months, the Poles smuggled them to Guatemala – they forded a river on moonless night – and then put them on a cargo ship bound for Casa Blanca. In Morocco they transferred to a ship that took them to Spain, where they boarded a flight to Warsaw. After six months in Warsaw, they were sent to Moscow a day or two ahead of Barr.

The KGB created less elaborate legends for Sarant and Dayton than Barr's. He became Philip Staros, the son of Greek emigrants to Canada, and a radar engineer who had worked in the U.S. for Western Electric and Bell Labs – a career path that closely mirrored reality. Carol became Anna Staros.

The transformation in his character was far more striking than Sarant's change in name. While Sarant had been the junior partner in their clandestine activities in the U.S., from the start Staros made it clear to Berg and to the Russians that from this point on he was very much the senior figure. Something had snapped on the path from Ithaca to Moscow. Sarant presented himself to the Russians as a brilliant engineer who had been thwarted because of his communist beliefs, and it seems that the KGB believed him, or at any rate was willing to let him prove himself.

From now on, I'll refer to Barr and Sarant by their Soviet names, Berg and Staros.

Someone in the Lubyanka decided to send the trio to Prague, a decision that undoubtedly saved their lives. It is difficult to believe that three Americans, one a Jew, could have survived the poisonous final years of Stalinism.

In Prague, Staros and Berg were put in charge of a 30-member team at a high security Army R&D unit. Their task was to create a computerized anti-aircraft weapon. Staros quickly learned to speak

Czech and he and Berg started the project from scratch because Czechoslovakia lacked many of the basic components needed to build analog computers. They succeeded, building a prototype of the first computerized anti-aircraft weapon built in the Soviet bloc, one which was still in use with minor modifications at least into the late 1980s.

While they overcame formidable technical hurdles, the cultural and political obstacles were at least as daunting. Staros took firm control over his employees, imposing American style management principles like personal accountability that were both a major reason for his success and a source of great tension. This tension boiled over into so-called anonymous reports to the StB secret police. I said so-called because the StB knew who its informants were and put the term anonymous in quote marks in its own memos.

The StB launched a series of investigations of Staros and Berg. It quickly discovered that the paperwork requesting that they be given clearance to work on top secret defense projects was signed by the then head of the Czech Communist Party, Rudolph Slansky. There can be little doubt that Slansky did so at the instruction of the Soviets. In any case, the signature that once opened any door in Czechoslovakia became, after Slansky's arrest in November 1951, a tremendous liability. In addition to Slansky's endorsement, and their foreign backgrounds, Staros and Berg were tainted by reports from their employees that they were critical of Czech economic policies, and that they publicly discussed forbidden topics such as anti-communist riots in Czechoslovakia and East Germany.

The StB investigation, as described in memos released to me by the Czech Interior Ministry Archives, was heading down a path that usually ended in imprisonment. The StB, Interior Ministry and Communist Party internal memos indicate that three investigations were launched into Staros and Berg, but each time they were derailed. The hand of the Russian liaison officials can be detected in the termination of the investigations. In 1954, the files indicate, Slansky's successor Antonin Novotny personally signed an order giving Staros and Berg authority to work on secret defense research. One of the last memos in the file mentions Berg's ties to "friends," a euphemism for Soviet intelligence.

Feklisov was posted to Prague for part of the time that Berg and Staros were there, and he says he met with them once to discuss their future.

In mid-1955 the anti-aircraft computer was tested and Staros and Berg were awarded honors by the Czech government for their achievements. They tried to convince the authorities to dramatically expand their laboratory and to back a program to develop digital computers, but got nowhere.

Their success came to the attention of Soviet military industry. A senior defense official visited Staros and Berg in Prague and offered them positions in Leningrad.

I should mention that by this time Carol had given birth to three children and Berg had married a Czech girl. I'll be getting back to this.

Staros and Berg moved to Leningrad, quickly picked up rudimentary Russian, and set up a much better funded and equipped laboratory than they'd had in Prague. Their operation was part of the vast galaxy of classified operations that for security reasons were publicly identified only by post box addresses, but also had slightly more descriptive secret names. It started as Special Laboratory 11 and went through several name changes, ending up as the Leningrad Design Bureau.

They were introduced to Admiral Axel Berg, who used to tell Berg's colleagues cryptically that he was the "real Berg." Admiral Berg was in charge of Soviet radar and military computing. The meeting was extraordinary because he held a similar position during World War II and therefore he was among the recipients of the Rosenberg ring's technical intelligence.

Admiral Berg became a strong ally and backer of Staros and Berg's work in the Soviet Union. Both Berg and the general who had recruited them to come to Leningrad were members of a tight knit, informal network operated by Dmitri Ustinov, who ran what amounted to a government within the Soviet government and eventually

became Defense Minister. This patronage was key to the Americans' ascent.

Their first project was to design a component for the equipment that tracked the Sputnik. In February 1958, Staros and Berg were awarded Order of the Red Banner, one of the Soviet Union's highest accolades. Like others engaged in secret work, the order didn't include a commendation specifying the achievements that led Presidium of the Supreme Soviet to award it, and the archives that hold files with this information are closed. It is possible that the award was for their work on the Sputnik, but this seems unlikely because individuals who made far more substantial contributions to the project were not similarly awarded. It seems more likely that the order was recognition for their work during World War II.

Their first project in Russia was the last work Berg and Staros did that was directly derived from their experience in the U.S. Before discussing their achievements in Russia, I'll switch gears for a few moments and outline the contributions that the Rosenberg ring made, which I don't think have previously been adequately described. Controversy over the value of the atomic secrets that David Greenglass turned over has obscured their other contributions.

From Venona, Feklisov's memoirs, and based on the FBI's investigation of the technology they had access to, and presumably gave the KGB, there was a substantial technology transfer. According to Feklisov, Barr and Sarant provided about 9,000 pages of secret documents relating to over 100 weapons programs. They had access to the most advanced radar in the American arsenal, to analog computers used to aim artillery and anti-aircraft weapons, to technology that makes it possible for radar operators to distinguish between friendly and enemy aircraft, and to innumerable bits of invaluable practical how-to knowledge. Bill Perl, another member of the ring, gave the Soviets the complete 12,000 page blueprint of the Lockheed P-80 Shooting Star, the first American jet airplane to be manufactured in large quantities. Perl also gave wind tunnel data from experiments with jet airplane fuselage and tail designs. Rosenberg gave the blueprints and a working model of the proximity fuse, which along with radar was a decisive element in the allied victory.

All of this was information that the Americans and British were deliberately withholding from their Russian ally. The U.S. and U.K. decided early on in the war that they would not share detailed information about any advanced weapons system with the Soviets. Security was a serious concern, especially when the Germans were on the advance in Russia. If the radar information Barr gave to Russia had fallen into Nazi hands, the impact would have been disastrous. I don't think it is an exaggeration to say that the outcome of some battles, if not the war, would have been altered. To cite one example, if the Germans had known the microwave frequencies used by American and British airborne radar they could easily have jammed it. When I suggested this to Barr he was astounded; he'd never considered that supplying information to the USSR posed this kind of risk. Apparently, neither he nor Rosenberg considered the possibility that the men they were dealing with might not really be Russians, that they might have been Nazis pretending to be Communists.

Another reason for denying Russia high technology was the practical reality that it wouldn't be able to make use of it in time to put it on the battlefield against Germans or Japanese. In fact, much of the Rosenberg ring's technology didn't go into production in Russia until after the war. But Russian clones of American radar – particularly models the Barr and Sarant worked on – were ready in time for the Korean war, and knowledge about American jet fighter capabilities was put to use in the skies about Korea and in subsequent conflicts. The proximity fuse, allied with an improved version of American radar, knocked Francis Gary Powers' U2 out of the sky.

Some of the technology in the TU-4, the Russian clone of the B-29 that dropped the atom bombs on Hiroshima and Nagasaki, almost certainly came from the Rosenberg group.

Returning to Berg and Staros, once they completed their Sputnik work, everything else they accomplished in the USSR was original; it went far, far beyond anything they were exposed to in the U.S.

In July 1959, Staros and Berg created a prototype of a new computer, which they dubbed the UM-1. The UM-1 achieved a number of Soviet

firsts. It was the first Soviet computer to use transistors. In contrast to the room-sized monsters produced by other Soviet computer designers, the UM-1 was small enough to fit on a kitchen table, light enough for one person to lift, and it required about the same power as a light bulb. It attracted a lot of attention. Ustinov and the head of the Soviet Air Force came to Staros and Berg's lab to inspect it.

This success led to an expansion of their team, to about 2,000 people over the next two years. They designed another computer, a civilian version of the UM-1 called the UM-1NKh, which was eventually put into production and was widely used in applications such as steel plants and nuclear power stations. They then went to work on a much more advanced computer, an all-purpose computer for use in airplanes, in space, and for missile control. The team also worked on more fundamental microelectronics technologies – in fact Staros introduced the term microelectronics into the Russian language – and developed a novel type of computer memory that was more advanced than anything in the U.S. at the time.

In 1962 Staros and Berg received a visit from a young engineer who was looking for help with some components of a cruise missile guidance system. He was quite impressed by their achievements and he reported on them to his father. The engineer's name was Sergei Khrushchev and his father was Nikita Khrushchev. Sergei's comments, and strong support from Ustinov and Admiral Gorshkov, who also knew the two foreigners, prompted Nikita Khrushchev to arrange a visit to see Staros and Berg's operation.

An official Kremlin photographer recorded scenes of Staros showing Khrushchev an UM-2 prototype. Barr is standing behind them in the photo and Gorshkov, Ustinov, and a group of very senior party officials are clustered around.

Interestingly, by this time Staros spoke better, or at least more proper, Russian than Khrushchev. After the tour, he showed Khrushchev a series of posters depicting advances that could be achieved if the USSR invested in microelectronics R&D – missile defense, guidance systems for nuclear missiles, and other mostly military applications. All of this could be accomplished, Staros said, by funding a massive project, which he and Berg would head, to build

R&D labs, production facilities and educational institutions. The endeavor should, in Soviet style, be based in its own town dedicated to the purpose.

To the astonishment of Staros, Berg and officials in his entourage, Khrushchev agreed to the proposition on the spot. He warned the two Americans – Khrushchev knew they were Americans, but very few others did, not even Berg's wife – to expect opposition from the bureaucrats, and told them to contact him personally through an aide if they ran into any problems.

And it started out very quickly. First, Staros was made a party member – the papers inducting him into the party were signed by Khrushchev himself – and a Soviet citizen. That August, Staros drove the first stake into the ground marking the beginning of construction of Zelenograd, the city outside Moscow that I showed you at the beginning of this talk. He and Berg kept control of their enterprise in Leningrad.

It wasn't completely smooth sailing, though. Staros generated quite a few enemies. One of his and Berg's most contentious practices was a strong policy of hiring based on merit; they preferred young guys just out of college who hadn't been ruined by exposure to the normal Soviet workplace. They refused to hire unqualified people who referred by local party officials. Even worse, from the Leningrad party's point of view, they hired lots of Jews. Throughout the Soviet Union there was a great deal of semi-official anti-Semitism, many universities were virtually off limits to Jews, as were entire professions, including military high technology. The Leningrad party organization was led by men who were infamous for being even more rabidly anti-Semitic than most Soviet officials.

There was also more than a little opposition to foreigners getting the top positions at a high prestige operation like Zelenograd. In the end, Staros was denied the top job and very, very reluctantly had to settle for number two, the scientific director. Still, he had over 20,000 people with advanced degrees reporting to him and probably more authority than any other foreigner ever wielded in Soviet military industry.

Staros, however, was obsessed with the idea of attaining the status of the aircraft designer Tupolev, or the head of the manned space program Korolyov, both of whom he knew, and was convinced that he needed to get the top job at Zelenograd. He and Berg pushed and pushed and finally, remembering Khrushchev's promise, wrote to the head of the Soviet government in the summer of 1964 outlining their grievances. They demanded a meeting with Khrushchev, and learning that he was on an extended vacation at his dacha, pushed for a meeting with a Politburo member. Incredibly, they got one. But Leonid Brezhnev was completely unsympathetic, wagging his finger at the foreigners and telling them that they had a lot to learn about the way things worked in the Soviet Union. What most impressed Berg about the meeting was the fact that Brezhnev wore diamond cuff links and a diamond stickpin in his tie. Although Berg remained a loyal communist to the day he died, he detested Brezhnev; those diamonds represented for Berg the way Brezhnev corrupted and drove the country into the ground.

Staros and Berg decided to wait until Khrushchev returned to the Kremlin, but he never did. When Brezhnev and colleagues put Khrushchev out to pasture, the letter Staros had sent him was discovered and it was sent to the very officials who he had complained about. A kind of trial was staged in which Staros and Berg were raked over the coals. They were genuinely afraid that it would end up with them in the Gulag, but Ustinov intervened on their behalf. They were thrown out of Zelenograd, but kept control over their Leningrad Design Bureau.

The Leningrad Design Bureau worked for the Red Airforce, for the space program, and civilian industry. But their most lasting physical legacy is a project for the Soviet Navy. They were commissioned to build the first digital control computer for a Russian submarine, called the Uzel.

In 1966, Berg was granted membership in the Communist Party and Soviet citizenship, which made it far easier for him to gain access to the Naval base in Latvia where Uzel development was being conducted.

In early 1973, Staros overcame his claustrophobia and joined a small group of admirals and senior officers in the control of a Soviet Tango-class submarine as it plunged under the Baltic Sea for a test of the Uzel. The Soviet military liked to reuse hardware whenever possible to keep development costs down and to enhance reliability. So when another generation of diesel subs was designed, which Nato calls Kilo class, it retained the Uzel; there is still a team of programmers in Leningrad working on Uzel software upgrades. Today Kilo subs, among the quietest submarines in the world, equipped with Uzels are operating in the fleets of China, Iran and India. So if the Chinese launch an attack on Taiwan, the Iranians decide to scuttle tankers in the Persian Gulf, or India attacks Pakistan's sea lanes, the torpedoes will be aimed and the craft will be navigated with the assistance of a computer designed by two American Soviet engineers.

About the time the Uzel was completed, Berg and Staros's fortunes took a turn for the worse. One of their most antagonistic foes, the head of the Leningrad Party, was promoted to a candidate member of the Politburo. Through a series of maneuvers, their autonomy was reduced and finally eliminated. Staros found himself a position as the director of a new artificial intelligence institute in Vladivostok, which is as far away from Leningrad as a person could get and remain in the Soviet Union. Berg stayed behind, retained his super-sized salary, but had little or no official responsibilities.

Staros died from a heart attack in 1979 and was eulogized in Izvestia as "a tireless scientist, a talented organizer who for many years gave all his strength and bright talent to the development of Soviet science and technology." There wasn't a clue about his foreign origins. Not long after this time the FBI and CIA finally gave up looking for Sarant and Barr; up to this time the bureau had monitored mail received by their relatives, conducted interviews of their relatives at least once a year, and maintained look-out notices at U.S. ports of entry.

From this point on the story is mostly of human interest, so I'll go back and fill in some of the interesting personal details. Berg married a Czech woman named Vera when he was in Prague. She was an only child, and there were two things her father Anton really hated: Communists and Jews. Berg was both, and he didn't endear himself to the old man when, before the marriage, he argued that Anton

should voluntarily sign over the land the Communist regime had confiscated from him. The night before the wedding, Anton grew so angry that he tried strangle Vera, and her mother had help pry the old man's hands from her throat. He refused to get out of bed to attend the wedding. A few months later, when Anton's wife died, he stood over her grave and told the assembled village – and Berg and Vera – that the death was God's retribution for allowing a Jew in the family.

After they moved to Leningrad, Vera had four children, two boys and two girls. She returned every summer to Prague, spending three or four months away from home. About the time that work started on Zelenograd, Berg met a young Russian woman named Elvira. They had an affair that lasted for the rest of Berg's life. Elvira, who was married to an Aeroflot engineer, had two of Berg's kids. He put the attitudes developed as an agent to use, and for almost twenty years kept his wife in the dark and essentially maintained two families who lived only a few kilometers apart. When Berg was about 70, a neighbor told Vera about the situation, she divorced him and moved back to Czechoslovakia, where she lives today. Because of her father's stubborn refusal to sign over his land to the Communists, and her refusal to adopt Soviet citizenship, all of the confiscated land has been returned to the family.

Carol Dayton's story is perhaps even more unusual. She never forgot about the two children she'd left behind, celebrated their birthdays every year and told her Russian-born kids that they had a sister and brother in America. After Sarant died, Carol's kids persuaded her to try to get in touch with Bruce, the husband she had abandoned. She remembered that he was a friend of Philip Morrison, and that Morrison wrote book reviews for Scientific American. She wrote to Bruce Dayton care of Morrison – it isn't clear whether the KGB was aware of the letter. He forwarded the letter to her mother. Carol was amazed in 1980 when she received a letter from her 95 year-old mother, saying that she was ecstatic to find her daughter.

Carol begged her contact at the KGB for permission to travel abroad to see her mother, but it was denied. She learned of her mother's death a year later in a letter from her daughter Derry, who was living in Canada.

Remarkably, in 1981 Carol's KGB contacts, who treated her with the affection and respect they felt for Staros, allowed a reunion between Carol and her American family. It was the height of the Cold War, just a year after the U.S. boycotted the Moscow Olympics. The Soviet government surreptitiously contacted Eric and Derry in Canada, arranged for them to be granted visas, and paid to fly them to Prague. A third relative, Jeremy Sarant, Alfred Sarant's son from his first marriage, joined Eric and Derry Dayton.

As far as I've been able to determine, the FBI and CIA were completely unaware of the visit.

After 31 years, Carol had to face the consequences of her impulsive decision to help Alfred Sarant escape. She had just ten days to explain to the grown-up children why they had been abandoned, and why she had never contacted them.

Unlike Berg, Carol Dayton never adjusted to Soviet life, nor did she ever get used to being separated from her kids. The meeting in Prague and a trickle of letters didn't come close to satisfying Anna's desire for contact with Eric and Derry. She pressed the KGB for permission to visit them in Canada. Rather than allow her to leave the Soviet Union, in 1987 the KGB permitted her American-born daughter Derry to travel to Leningrad with her 5-year-old daughter and 14-year-old son. She stayed with Kristina Staros, Carol's Russian-born daughter, and told her about the family Carol had left behind. After Carol disappeared, Bruce got his PhD and worked for a short time at MIT, but then the connection to the Rosenberg case made it impossible for him to find work as a researcher. He received an offer to join a former student of Oppenheimer's in India, Bernard Peters, but the State Department refused to give him a passport. He sued and the case ended up at the Supreme Court, which ruled in his favor. Dayton worked in India for a while, then worked in Europe, and eventually returned to the U.S.

Berg's family had only a murky idea of his real identity. Philip Staros told Vera in 1975 – twenty years after she married Berg -- that her husband was an American, not a South African of English descent as she had believed. He wasn't happy to have the secret revealed. He

rarely spoke with Vera about his American past and didn't say anything at the time to his children.

In 1985, a Russian émigré researcher at Harvard named Mark Kuchment who had heard from Soviets who had moved to the U.S. about two mysterious engineers, Staros and Berg, pieced together mystery. He published an article in *Physics Today* outing them as Sarant and Barr.

Barr eventually returned to the U.S., first in October 1990 as a Soviet scientist looking for funding for a novel technique for manufacturing integrated circuits. This was the project that first put me touch with him. To his astonishment, the FBI and law enforcement appeared to take absolutely no interest in him. On his second visit, about a year later, he applied for a passport, reporting that he'd lost his old one in Prague. The State Department sent a replacement and Joel Barr was back in business. He split the remaining years of his life roughly equally between Russia and the U.S., and much of the time he was here he stayed with me and my family. He died in a Moscow hospital, basically from poor medical care, on August 1, 1998.

Carol also regained her U.S. citizenship and returned in 1991. Incredibly, she eventually reconciled not only with the children she'd abandoned in 1950, but also with her former husband, Bruce Dayton. They live together today, quite happily.

As I said at the outset, I'd like to conclude with a few comments about the larger relevance of the case of Joel Barr and Alfred Sarant. First, because I knew him well, I can say a bit about what motivated Barr, and from his comments I think it is fair to say the motives of the other members of the Rosenberg ring were similar. Barr was a naïve, romantic communist. The harsh circumstances of his childhood played a major factor in his conversion to communism. So did the isolation from mainstream American society. Barr, Rosenberg and their comrades at City College grew up in an isolated, self-contained world, with only the vaguest notions of what life was like in the rest of the country, or of the values and ideals of most Americans. Of course, many people grew up in similar surroundings – my father, a few miles away from Berg in Brooklyn was among them – and they became neither communists nor spies.

But there is something eerily familiar about young, intelligent men who are part of a religious and ethnic minority allying themselves with a Utopian fantasy. And being willing to commit crimes against their country on behalf of this fantasy. This could serve as a fairly good description of Muhammad Atta and other leaders of recent terror attacks. The crimes committed by terrorists in the 21st century are on a different scale and of a different character from those committed by American communists in the 1940s, but I believe that an understanding of how fanaticism's roots lie in alienation from society, a desire to advance a romantic cause, and an understanding of how attractive it is people swept up in this kind of life to commit crimes, is relevant to understanding and fighting terrorism.

The FBI's failure to prevent Soviet espionage during World War II is also relevant today. Looking back, it is clear that the bureau's files were stuffed with clues, but no one thought to look. Today we would say – as people said about 9/11 -- no one connected the dots. Similarly, once Rosenberg, Barr, Sarant or others were fired from Army jobs, there was no procedure to follow up to see what they did next, and no requirement that defense contractors vet people with access to classified information with the FBI. This was probably because the FBI felt that the threat from domestic communists was subversion, not espionage.