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The Architecture of Evil

Roger Forsgren

For the commission to do a great building, I would have sold my soul like Faust. Now I had found my Mephistopheles. He seemed no less engaging than Goethe's.

–Albert Speer

Someone designed the furnaces of the Nazi death camps. Someone measured the size and weight of a human corpse to determine how many could be stacked and efficiently incinerated within a crematorium. Someone sketched out on a drafting table the decontamination showers, complete with the fake hot-water spigots used to lull and deceive doomed prisoners. Someone, very well educated, designed the rooftop openings and considered their optimum placement for the cyanide pellets to be dropped among the naked, helpless men, women, and children below. This person was an engineer, an architect, or a technician. This person went home at night, perhaps laughed and played with his children, went to church on Sunday, and kissed his wife goodbye each morning.

The technical professions occupy a unique place in modern society. Engineers and architects possess skills most others lack—skills that allow them to transform dreams of design into reality. Engineers can convert a dry, infertile valley into farmland by constructing a dam to provide irrigation; they have made man fly; and architects have constructed buildings that reach thousands of feet into the sky. But these same technical gifts alone, in the absence of a sense of morality and a capacity for critical thought and judgment, can also make reality of nightmares. Ferdinand Porsche, the engineer who designed the Volkswagen—an automobile that revolutionized personal travel for the common man—also designed a terrifying battle tank that helped kill millions of Russians on the Eastern Front. Wernher von Braun, who would later design the Saturn V rocket that brought American astronauts to the Moon, designed the V-2 rockets with which the Nazis terrorized Antwerp and London in the waning months of the Second World War.

Few men better exemplify this danger than Albert Speer, Adolf Hitler's chief architect. From bold, looming edifices, to giant swastika banners, to

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the intimidating searchlights of the "cathedral of light" piercing the night sky around one of the Nazi Party rallies at Nuremberg, Speer's designs became icons of Nazi megalomania. He shared with the dictator a vision of a redesigned Berlin that, when the Third Reich conquered the world, would be a lasting monument to its power for ages to come. "Your husband is going to erect buildings for me such as have not been created for four thousand years," Hitler told Speer's wife, reflecting both the scale of their shared ambition and the shared admiration and peculiar friendship that developed between the two men over the course of the war.

Hitler was so enthralled with Speer's creativity and ability to carry out orders with efficiency and speed that he appointed Speer Minister of Armaments and War Production for the Third Reich during the height of World War II. In this powerful office, Speer was for the final three years of the war in charge of supplying the German military. He oversaw the management of a substantial portion of the German economy; he kept the factories running, and the troops supplied with tanks, bombs, planes, and ammunition, continuing to increase production even during the height of Allied bombing. These accomplishments earned him recognition, from both within the Third Reich and outside it.

Among Speer's major responsibilities was procuring manpower to keep the factories in operation—and he thus played a major role in instituting the Nazi forced-labor programs. On trial at Nuremburg after the war, Speer claimed full moral responsibility for the whole of the actions of the Nazi Party, and yet professed that he had no knowledge of the extermination of the Jews or the atrocities taking place in concentration camps. Whether or not he was telling the truth about his ignorance of these atrocities has been hotly debated ever since. What is indisputable is that the court did not sentence him to death, as it did many of his peers. Instead he spent twenty years in prison, time he spent reflecting on his memories, coming to terms with his actions, and writing about his life and the inner workings of the Nazi Party—writings he later published as *Inside the Third Reich* (1970) and *Spandau: The Secret Diaries* (1976).

Albert Speer did not, as far as any historians know, personally design any death chambers, nor did he personally kill another human being. But Speer did use his brilliant technical expertise and talents to enable the war efforts of the most evil regime in history, allowing it to murder millions of human beings. But even as we condemn him, we must ask—especially we engineers and technicians—is Speer so different from us? How many of us would be willing to compartmentalize our emotions, suppress our consciences, almost to sell our souls, for the opportunity to work on the

grand projects that Speer was involved in? How many of us are so focused on solving a technical problem that we fail to contemplate where that solution might lead?

To many engineers, Speer and his experiences during the war may seem irrelevant today. But although there seems to be little chance (we hope) of a highly industrialized power again waging a war of world conquest, the essential questions that Speer faced still pertain to the work of many engineers today. You may be an engineer sitting in front of a computer-aided design screen, creating a seemingly benign component that will become part of some sophisticated weapons system that will be sold to unknown people in a far-off land. You may be a computer security researcher, or a virologist, and discover some new potential weapon or security vulnerability, and have to decide how to make the information public to shield against such attacks, but without helping those who would launch them. Or you may design automobile parts, and be faced with a compromise between saving your company production costs and protecting the lives of customers.

Almost every engineer in the course of his career faces moral decisions that are similar to, if less weighty than, the ones that Albert Speer faced. In examining Speer's life, we must ask to what extent his character is representative of the technical personality in general. The challenge today's engineer must confront—as, by extension, must each of us who is wrapped up in the modern scientific-technical project—is to wear Speer's shoes and to ask honestly, without the benefit of historical hindsight, "What would I have done?"

A Technical Mind

Albert Speer was born in 1905 in Mannheim to an upper-middle-class family that had benefited from Germany's meteoric economic growth. One of Speer's grandfathers was among the most successful machine-tool manufacturers in Germany; the other was a well-known architect. Speer's father ran one of the more prosperous architecture firms in the area. In the years before the First World War, young Albert was provided a very comfortable childhood in a Germany that was expanding economically at a rate that made it the envy of the world. He tended to be more serious and studious than his playmates, and showed an early interest in and love for mathematics.

The Speer family was not spared the terror experienced by much of Europe during the First World War, as the early years brought occasional

aerial bombings to Mannheim due to its proximity to the French border. The Speers also endured the food shortages faced by much of Germany, including the famous "turnip winter" of 1916-17, until the last summer of the war when the family was able to move out of the city and live in relative comfort.

The Treaty of Versailles that followed the savage war only aggravated the strong feelings of nationalism bordering on paranoia that had permeated Germany since its unification in 1871. Situated in the middle of Europe, between Russia and France, Germany continually feared being encircled and denied its rightful place on the world stage. Drawing on its Prussian roots, the new German state relied heavily on the influence of the military in its culture and public life. In all other Western countries of the time the military was subservient to the state, but in Germany it became the state's foundation. These factors nurtured a German disposition toward order and unquestioning state loyalty.

Speer recalled his school years during the postwar Weimar Republic where, despite the installation of a democratic government, German society still had difficulty adjusting to Western-style personal freedom and liberty. Students were told what to do and what to think. Politics was not to be discussed at school, he said, and "the traditional authorities were part of the God-given order of things." Speer's father was a liberal who supported Germany's republican experiment, but Albert maintained a total uninterest in politics. As he stated later in *Inside the Third Reich*:

> Father would have surely been glad to talk about politics with me, but I tended to dodge such discussions and he did not insist. The political indifference was characteristic of the youth of the period, tired and disillusioned as they were by a lost war, revolution, and inflation; but it prevented me from forming political standards, from setting up categories on which political judgments could be based.

Speer makes little mention in his autobiography of any religious or spiritual influences other than the fact that as a young man, he formed a sort of pantheistic "closeness with nature" that allowed him a sense of solitude while "escaping from the demands of a world growing increasingly complicated." Speer's family was Protestant but did not attend church. In a letter written years later to his daughter while serving his sentence at Spandau Prison, Speer suggested that he and his wife attended church mainly to please his wife's family, and that "when your mother and I did leave the church, it was in reaction to the political opposition of the churches to Hitler—I suppose it was a sort of statement of loyalty."

Young Albert did not grow up in a warm household. Biographer Joachim Fest, in *Speer: The Final Verdict* (2001), portrays his relationship with his mother as strained; she was "aloof" and focused on class pretensions, including disapproving of the woman he later chose to marry, deeming her lower-class. Speer admired his father but found him distant and reserved. He eventually viewed his parents as "virtually strangers."

Fest describes Speer as having a "lack of emotion" and a "shyness that was apparent at an early age." Later, after completing his twenty-year sentence for war crimes, Speer made friends with a Benedictine monk named Father Athanasius, who told biographer Gitta Sereny, in her 1995 book *Albert Speer: His Battle with Truth*, that "everything about Speer was discipline. I often wondered what happened to him as a child to make him into what he was, a brilliant man incapable of abstract thinking and, I think, incapable of sensual love and thus, finally, an incomplete man." Speer, the architect, designed a chair for his friend once and told him it was a design he "loved." Father Athanasius recalled, "It was the only time in the ten years I knew him that he pronounced the word 'love.'"

Speer graduated from high school in Weimar Germany hoping to become a university professor of mathematics. His father rejected the idea, saying, "Can you imagine yourself spending your life teaching in some backwater university?…You'd never make any money. You'd probably end up cramming snotty-nosed little morons. Is that the life you want?" Speer bowed to his father's wishes and took up the study of architecture. In 1924 he went to the Technical University of Munich. After graduating, he became an assistant professor at the unusually young age of twenty-three.

Speer later recounted that he "took no notice" of Adolf Hitler during his college years, even though Hitler was attracting growing numbers of disillusioned and angry youths to his speeches and rallies. Instead, Speer "was studying far into the night." But in late 1930, he was persuaded by his students to attend a speech that Hitler was giving in a nearby beer hall. Like many of his countrymen, Speer was swept away by Hitler's oratorical style after his first encounter with the man: "His irony was softened by a somewhat self-conscious humor; his South German charm reminded me agreeably of my native region.…He spoke urgently and with hypnotic persuasiveness." As for the substance of Hitler's ideas, Speer said, "The peril of communism, which seemed inexorably on its way, could be checked, Hitler persuaded us, and instead of hopeless unemployment, Germany could move toward economic recovery." But "the mood he cast was much deeper than the speech itself, most of which I did not remember for long." After the speech he felt he had to be alone to contemplate what

he had heard, and that evening he went for a long, solitary walk. The next morning he joined the Nazi Party.

From Architecture to Armaments

Speer soon found himself on the road to fame. By luck, he gained small architectural commissions from the party, and he was soon earning notice from party leaders for his efficiency and ability to meet tight schedules. These commissions grew in size, and soon Speer was working with Joseph Goebbels to renovate the party's headquarters in Berlin prior to the 1932 elections. After the Nazis won the election and Hitler became chancellor, Speer was invited to submit designs for the annual Nazi Party rally in Nuremberg. Hitler personally approved the plans during his first meeting with Speer, in Hitler's own apartment in Munich. In the weeks that followed, the two met and dined together on a near-daily basis, and formed a professional and personal friendship.

In 1934, Hitler made Speer the chief architect of the Nazi Party. Not long later, Hitler was declared Führer, absolute ruler of Germany. During the years leading up to the war, Speer was given increasing responsibility for designing buildings on a scale nearly unsurpassed in history, undertaking and quickly completing a series of ambitious projects, including, among many others, the stadium for the 1936 Summer Olympics (not Speer's original design, but he finished it), the German Pavilion for the 1937 International Exposition in Paris, and the construction in 1939 of the new Reich Chancellery. It was the latter that seems to have made the strongest impression on Hitler of Speer's vision and incredible organizational skills, as Speer managed to design and construct this formidable building within a year.

Perhaps his most iconic work was the "cathedral of light," created for one of the annual Nuremberg rallies. Speer commandeered over a hundred anti-aircraft searchlights from around Germany and arranged them in a series to create a sort of pillared border around the nighttime rally at the enormous outdoor parade grounds. The effect was solemn, almost spiritual, as the searchlights shone miles upward toward the overhanging clouds. The lights also magnified the apparent grandeur and scale of the rally, broadcasting to the world an exaggerated sense of German rearmament. Luftwaffe commander Hermann Göring objected to publicly revealing most of Germany's stock of searchlights, but Hitler overruled, saying, "If we use them in such large numbers for a thing like this, other countries will think we're swimming in searchlights."

Speer quickly moved into the Führer's inner circle, where Hitler shared his vision with the young architect. Hitler wanted to make Berlin into the most impressive city in the world, conveying the beauty and overwhelming strength of the triumphal Reich that would dominate the world—and Speer was to be the master planner. Speer conceived of the city's buildings to have what he called "ruin value"—meaning that they were meant to be built to last for thousands of years, like the ancient ruins of Greece. Hitler embraced this concept, which accorded with his vision of a Thousand Year Reich.

The dream of Hitler's new city, which was to be renamed World Capital Germania, was without parallel in the modern world. Speer planned as the centerpiece a gargantuan domed Great Hall that would hold 180,000 occupants as they listened to the Führer's speeches. Had it ever been built, Speer's dome would have dwarfed any structure nearby, and could have contained several domes the size of the U.S. Capitol. Along the sprawling grand avenue leading to the Great Hall would be a German version of Paris's Arc de Triomphe, intended to dwarf Napoleon's. Elsewhere, at the Nuremberg rally grounds, construction began (but was never completed) on a German Stadium that would have held 400,000 spectators.

It is not certain that these plans could have been realized. Among other issues, Berlin was built on converted swampland, and there are serious doubts that the ground would have been able to support the huge weight of such structures; test structures built by the Nazis suggested that the buildings would sink well beyond tolerable limits. Regardless of the feasibility, this was art and architecture based on ostentation and megalomania. The plans, of course, spoke of the intoxication with power not just of the state, but of the men who ran it. Speer found himself elevated with breathtaking rapidity to the highest echelons of power, and developed a close personal relationship with the most powerful man in Germany, who was idolized and worshiped by millions of Germans and feared by millions more around the world. Speer looked up to Hitler and seemed to crave his approval. Hitler, for his part, spoke of having "the warmest human feelings" for Speer, and regarding him as a "kindred spirit." Gitta Sereny writes that "in looks and language, the tall, handsome young Speer probably came close to being a German ideal for the Austrian Hitler." Speer admitted at the Nuremberg trials that "if Hitler had had any friends, I would certainly have been one of his close friends." Hitler formed a deep admiration for Speer's architectural style and ambition. He had always considered himself an artist first, who only became a politician to realize his dream of a powerful Germany, and he saw in the young Speer his own

unfulfilled self—someone who was technically capable of achieving his artistic dreams for a Germany that would rule the world.

In February 1942, Fritz Todt, Hitler's Minister of Armaments, charged with supplying the German armies with the weapons and munitions needed to establish an empire stretching from North Africa to the Arctic and from France to Soviet Russia, perished in a plane crash. In an astonishing move, Hitler promptly appointed his young architect, who had no military experience, as Todt's replacement. Speer recounts that he was stunned, but some historians claim he was a young, ambitious technocrat who saw Germany on the brink of conquering the world and maneuvered himself into Hitler's inner circle for just such an opportunity. Whatever the case, Hitler recognized Speer's genuine capacities for organization and efficiency.

In his new role, Speer commanded a massive sector of the German economy. He focused on the highest material priorities for the German war machine, and understood how to use Hitler's backing to bulldoze through the elaborate and inefficient Nazi bureaucracy in order to meet those needs. Speer also had to guide an economy that was not yet fully devoted to the war effort, as the Allied economies largely were. Hitler had at first refused to allow the war effort to interfere with the production of everyday consumer goods; he understood the fragility of power well enough to know he could be toppled should widespread discontent develop. But this all changed after the Battle of Stalingrad concluded in February 1943. After this disastrous and pivotal loss, propaganda shifted to drumming up public support for total war, and the German economy became fully devoted to the war effort.

Despite American and British bombers obliterating the huge factories feeding the Wehrmacht, Speer was actually able to increase German war production. Incredibly, amidst the widespread destruction on the home front, German production peaked as late as 1944. From a technical standpoint, this was an astonishing achievement. The American and British bombers devastated whole cities and entire industrial complexes, yet Speer was able to increase production by moving critical munitions work underground, rapidly repairing damaged factories, decentralizing massive complexes, and scattering the production over a vast area, making it more difficult for Allied bombers to locate and destroy.

But Speer's success was not solely a matter of his intelligence and organizational skill; it came also from the utilitarian advantages of the Nazis' perverse moral standards. With millions of young German men serving on two fronts, there was a huge labor shortage in German

industry, and Nazi ideology prevented women from filling these roles, as they largely did in Britain and America. Speer was desperate to meet the munitions and armament requirements of the German armed forces in their titanic struggle to stop the Red Army's advance on the Eastern Front, to end the incessant bombings of German cities and industrial complexes by the British and American air forces, and to stem the Allied invasions of Italy and France. He knowingly employed men who had been forcibly brought to Germany from conquered countries, and when that didn't fulfill his needs, he turned to slave labor—both captured prisoners of war and concentration-camp labor. Gitta Sereny, in *The Healing Wound* (2001), reports that Speer directed an enormous workforce of 28 million, of whom 6 million were forcibly imported from conquered countries and 60,000 were concentration-camp prisoners. Through his technical genius and the labor of millions of impressed workers, Speer was able to give Hitler and his armies the weapons needed to prolong the most murderous and devastating of all wars.

Accepting and Excepting Guilt

In March 1945, with the Red Army on the outskirts of the capital, Speer learned of the military's plan to call up all remaining reserves for the final Battle of Berlin. Speer was certainly intelligent enough to understand that the war was lost. And not only had Hitler brought Germany into a war of annihilation in which it was completely devastated, but he was now proposing an even more radical phase that would in effect wipe out the German nation.

The reserves to be called included young children, old men, and even the members of the Berlin Philharmonic Orchestra. Speer foiled this plan and had the musicians' papers shredded. He arranged a concert to be held in April at the Berlin Philharmonic Hall; during the dying days of the Thousand Year Reich, in an unheated, unlit hall, the audience huddled in their overcoats and listened to Wagner's *Twilight of the Gods*. At the exits, knowing the end was very near, Hitler Youth handed out potassium cyanide capsules to those Berliners who preferred to die rather than face the vengeful soldiers of the Red Army who were now at the gates, and were indeed soon to perpetrate atrocities upon the German civilians.

Speer grew apart from Hitler as the war began to be waged on German soil. His moral epiphany seems to have come when Hitler drew up the Nero Decree on March 19, 1945. Hitler was determined that if the German people could not achieve world domination, then the conquering

armies should be left with nothing but a desolate and ruined country. He tasked Speer with destroying the country's industrial infrastructure before the Allied armies could attain control. To do so, Speer understood, would have meant deepening the suffering of the population after the war's end; by destroying the electrical grid, the water systems, the bridges, and the means of production, life would become nearly impossible for the defeated German people.

To his credit, Speer made it his responsibility to counter Hitler's orders and sabotage his scorched-earth plan. Speer knew he was putting his life at risk by working against Hitler. By the end of the war, Hitler was in a satanic rage against his generals and his staff, placing blame on all of them for the war's failure. Hitler trusted no one and had no remorse at having anyone he considered a traitor killed—including thousands of his own officers and soldiers over the course of the war. Despite the personal risk involved, Speer used the privileged powers of his office to travel around the country that was now being inundated by enemy troops, convincing military leaders not to carry out the Nero Decree.

After the war's end, Speer and the remaining Nazi elite were tried at Nuremberg, the city once famous for Hitler's rallies and Speer's cathedral of light. Despite his lawyer's advice, Speer admitted guilt—the only of the defendants at Nuremberg to do so. Speer devised a complicated defense stating that as a high official in the Reich government he must be held accountable for its actions—but that he was not personally involved in the atrocities committed by Hitler and his henchmen. He claimed that he was simply a technical person, an architect, and was unaware of the worst crimes being committed by the Nazi regime until it was almost too late.

As with all the Nazi defendants, Speer was continually interviewed and analyzed by a variety of Allied doctors, lawyers, and intellectuals. He struck them as different from all the rest. An article in *Life* magazine during the trials noted, "Whereas most of his fellow prisoners are unmitigated thugs, Speer, by contrast, is a charming, cultivated and intelligent man. It was these qualities, combined with a conscience that subordinated everything to ambition, that made him one of the most dangerous of all the Nazis."

Speer indeed asserted that his real crime was ambition—that he did what almost any other architect would have done in his place. He also admitted some responsibility, noting, for example, that he had opposed the use of forced labor only when it seemed tactically unsound, and that "it added to my culpability that I had raised no humane and ethical considerations in these cases." His contrition helped to distance himself

from the crude and unrepentant Nazis standing trial with him, and this along with his contrasting personal charm permitted him to be known as the "good Nazi" in the Western press. While many other Nazi officials were hanged for their crimes, the court favorably viewed Speer's initiative to prevent Hitler's scorched-earth policy and sentenced him to twenty years' imprisonment.

Responsibility and Denial

Albert Speer spent the two decades of his captivity trying to come to terms with himself and his actions—trying to understand how he allowed himself to become subservient to the most wicked regime in history. "I was not just entangled in a thicket of deceptions, intrigues, baseness, and killing," he wrote. "I myself had become part of this perverted world. For twelve years…I had lived thoughtlessly among murderers."

During cross-examination by Robert H. Jackson, the U.S. Supreme Court justice who was serving as the lead American prosecutor at Nuremberg, Speer defended himself from accusations regarding his use of slave labor by claiming a simply pragmatic opposition to the practice: "It is clear that a worker who has not enough food cannot achieve a good work output. I already said yesterday that every head of a plant, and I too at the top, was naturally interested in having well-fed and satisfied workers, because badly fed, dissatisfied workers make more mistakes and produce poor results." With the distance of time, and his life not at stake, Speer recounts in his autobiography a more credible anecdote of a visit he made to one of his steel plants, where Russian prisoners of war were working as slave labor. Speer noticed the fear and terror in their eyes when he tried to inquire about their conditions, but

> I asked no further questions. Why should I have done so; their expressions told me everything. If I were to try today to probe the feelings that stirred me then, if across the span of a lifetime I attempt to analyze what I really felt—pity, irritation, embarrassment, or indignation—it seems to me that the desperate race with time, my obsessional fixation on production and output statistics, blurred all considerations and feelings of humanity. An American historian has said of me that I loved machines more than people. He is not wrong. I realize that the sight of suffering people influenced only my emotions, but not my conduct.…I continued to be ruled by the principles of utility.

But perhaps even more central to understanding Speer's actions during the war than his complicity in the use of forced labor is the question

of his awareness of the Holocaust. The story of Speer is more deeply confounded by the fact that even this basic and central issue remains highly debated among historians. The most current thinking is that Speer was lying at the Nuremberg trials when he claimed he knew nothing of the mass murders. Many scholars now believe he may have presented a clever and cunning defense by stating that he wished to accept responsibility for the crimes of the Nazis on the basis that, as a technocrat, he helped the regime survive and prosper yet he still knew nothing of the death camps. Speer claims he personally was never an anti-Semite, that "I had Jewish friends from my school days and university days," and even that he could hardly recall any anti-Semitic remarks being made by Hitler. In his autobiography, he says that "Hitler's hatred for the Jews seemed to me so much a matter of course that I gave it no serious thought."

As for the concentration camps, Speer stated that a colleague had visited Auschwitz and had warned Speer never to go there. But, still, "I did not query him, I did not query Himmler, I did not query Hitler, I did not speak with personal friends. I did not investigate—for I did not want to know what was happening there.... From that moment on, I was inescapably contaminated morally; from fear of discovering something which might have made me turn from my course, I had closed my eyes." Speer did once visit the Mauthausen concentration camp in Austria, but was given the VIP tour, devised by the SS to limit exposure to anything disturbing. Much of the contention now is over whether Speer was present at Heinrich Himmler's terrifying 1943 speech at a conference in Posen, where Himmler made certain that all present understood that they were all just as responsible as he was for the extermination of the Jews. (In his disturbing logic, Himmler even stated his sympathy with those who had to endure the crude and heartless work of killing women and children, but assured them that future generations of Germans would be grateful.) Speer denied having been present at the speech, and two Nazi Party members later testified in support of this claim. But Speer in fact gave a speech at the conference earlier that day, and most historians now believe that he was present for the speech, or was at least made aware of it. In 2007, the *Guardian* reported the discovery of a 1971 letter by Speer that, if authentic, explicitly shows him admitting to being present and fully understanding the message of the speech.

Whatever the facts on this question, it seems certain that a willful denial of reality, and of his own complicity in events, was at work in the actions of Albert Speer from an early stage. Speer admits as much when he discusses in *Inside the Third Reich* his fateful decision to join the Nazi

Party. In retrospect, Speer realized how surprising it was that someone like him—a technical person, someone who relied solely on facts—could have made such a monumental decision without fully understanding what he was committing to:

> As an intellectual I might have been expected to collect documentation with the same thoroughness and to examine various points of view with the same lack of bias that I had learned to apply to my preliminary architectural studies. This failure was rooted in my inadequate political schooling. As a result, I remained uncritical, unable to deal with the arguments of my student friends, who were predominately indoctrinated with the National Socialist ideology. . . .
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> Not to have worked that out for myself; not, given my education, to have read books, magazines, and newspapers of various viewpoints; not to have tried to see through the whole apparatus of mystification—was already criminal.

Perhaps even more telling of Speer's personality were later events in which he was confronted directly, not just implicitly or rhetorically, with the violence of Hitler and the Nazis. In 1934, Hitler brutally consolidated power by rounding up, arresting, and in perhaps hundreds of cases murdering his political opponents, in an event known as the Night of the Long Knives. Hitler sent Speer to begin converting the office of Vice-Chancellor Franz von Papen into a security headquarters. Speer writes, "In one of the rooms I saw a large pool of dried blood on the floor. There, on June 30, Herbert von Bose, one of Papen's assistants, had been shot. I looked away and from then on avoided the room." Speer would later react similarly to seeing the shattered Jewish storefronts and the smoldering fires from synagogues after *Kristallnacht* in 1938. He confessed that "what really disturbed me at the time was the aspect of disorder that I saw on [the street]: charred beams, collapsed facades, burned-out walls."

It is clear also that Speer was subject to the cult of personality surrounding Hitler, and that this effect was greatly deepened by their personal relationship. "All I *wanted* was for this great man to dominate the globe," Speer told Gitta Sereny; "that was the whole point of my buildings." In 1975, the psychologist Alexander Mitscherlich described their relationship as "homo-erotic (not sexual)... the result of needs each could uniquely fulfill for the other." Hitler saw Speer as fulfilling his own thwarted fantasies, and Speer admired Hitler to the point of viewing him as a personal hero, yearning for his approval and protection. Speer told Sereny that he largely agreed with this analysis.

Speer's psychology, however, can hardly be seen as childlike; it was more than love and approval he sought. He writes that "feelings of exultation filled me" when he realized his "signature could mean the expenditure of billions of marks and direct hundreds of thousands of people to the construction sites." Only later, he claims, did he "become aware that as an architect at Hitler's side I was also seeking the pleasures of power."

His attempt to wall off his sense of moral responsibility from the ramifications of his actions were at work early on in sophisticated ways; long before he was busy convincing his accusers at Nuremberg that he was just a technocrat, he was busy convincing himself. In the first place, this was a matter of practices. Speer saw his work as primarily goal-oriented; as noted above, he writes that "the desperate race with time, my obsessional fixation on production and output statistics, blurred all considerations and feelings of humanity." He says of himself and his colleagues that "our burying ourselves in work was an unconscious effort to…anesthetize our conscience."

But the more telling means by which Speer insulated himself from responsibility was not habitual but rational. Speer writes, "I felt myself to be Hitler's architect. Political events did not concern me.…I felt that there was no need for me to take any political positions at all. Nazi education, furthermore, aimed at separatist thinking; I was expected to confine myself to the job of building." These statements chillingly bespeak the compartmentalizing capacities of the human psyche—and especially the technically oriented psyche—when one realizes that what Speer was referring to with a shrug as "political events" and "political positions" were the rise of a brutal dictatorship and the institution of a war of world domination and an extermination program that would each result in the deaths of tens of millions of people.

Straight Lines and Crooked Timber

Albert Speer's life is a warning to all engineers that their creative powers to design and build are capable also of unleashing tremendous harm and destruction. In a sense, there were perhaps few more dangerous men in the twentieth century than Albert Speer—all the more so because he did not fully realize what he was doing. It was almost too late in his life, and certainly too late for the world and the lives lost, when Speer finally understood his horrific personal failures.

It might be said that Speer exemplifies what happens when a technical person becomes too absorbed in his work. Speer claimed at his trial that he was simply doing what nearly any other architect would have done; he was

too busy "studying far into the night" to even discuss the political world exploding all around him, too lacking in the ability to think discriminately and critically, and so he found himself "unable to deal with the arguments" of his cohorts, and instead just went along. Perhaps it is the inherent nature of the technical disciplines that brings their practitioners to view the world with a practical eye, to possess a preoccupation with efficiency and order—even to the point of ignoring the humane values of dignity and justice. These are characteristics that will surely sound familiar, to some extent, to those who have worked with engineers, even if in far less sinister contexts.

But to accept this interpretation is to accept Speer's own attempt at self-exoneration at his trial—as somehow genuinely incapable, whether due to isolation or naïveté, of intimating the true nature of his work. Though we might accept that Speer did not have malice or evil deep within him—that at least in his soul he was a far better man than most of the Nazi hierarchy—it seems clear that he knowingly let his remarkable talents be used in service of one of the most evil men in history, and to carry out the work of one of history's most brutal regimes.

Although extremely intelligent, Speer willfully closed his eyes and helped to implement atrocity. This he accomplished not only by focusing on his work, but most fundamentally by adhering to the notion that his work was independent from affairs that were ostensibly merely "political," and needn't concern him. Speer admits to having espoused this idea until shockingly late in the war, well beyond the point when he himself was in charge of supplying the forces of the (decidedly political) German war machine:

> The grotesque extent to which I clung to this illusion is indicated by a memorandum of mine to Hitler as late as 1944: "The task I have to fulfill is an unpolitical one. I have felt at ease in my work only so long as my person and my work were evaluated solely by the standard of practical accomplishments."

We can see, moreover, that Speer even at the time understood that this was but a useful fiction—and that this was not simply a late-found revelation of wrongdoing but a deliberate, rationalized squelching of his moral capacities. For Speer was not merely in thrall of the delusion that technical work is morally neutral, but seems to admit that he knowingly cultivated this idea in his own workers in order to induce in them the same effects that Hitler was inducing in Speer:

> Basically, I exploited the phenomenon of the technician's often blind devotion to his task. Because of what seems to be the moral neutrality

> of technology, these people were without any scruples about their activities. The more technical the world imposed on us by the war, the more dangerous was this indifference of the technician to the direct consequences of his anonymous activities.

To Engineer Is Human

Speer may seem too dramatic an example to be of much relevance to scientists and engineers today, who are seldom given such power, or such opportunities to determine the fates of so many. But his story still resonates, not only because engineers still inevitably face moral choices of some degree, but because of how unsettlingly familiar is the mantra he apparently repeated to permit himself to continue with his work. Speer, that is, convinced himself of what remains one of the shibboleths of the technical professions to this day: that science and technology, no matter what their implications or the ends toward which they are employed, are completely apolitical and amoral in character.

This is a fiction we must devote ourselves to breaking—in our culture at large, but starting with the education of the practitioners of the technological and scientific enterprise. Insofar as they are concerned with discovering truths about nature, scientists can argue that knowledge of the truth, regardless of its implications, is better than ignorance. But engineers, as they convert these scientific truths into technical capacities, must concern themselves with the moral consequences of where their engineering creativity may lead. Increasingly today, we focus our engineering education almost exclusively on the analytical core of science and mathematics. The authors of the textbook *Engineering and Society: Challenges of Professional Practice* point out that "as the technical content of engineering programs has increased, treatment of broader social issues has tended to be squeezed out. An underlying assumption has been that technology is value-free and that therefore any consideration of human emotions, needs, and aspirations is extraneous, if not irrational. Many engineering courses have been structured so that they avoid explicit value judgments."

Today's engineers need a more well-rounded education—one that stresses not only the analytical skills necessary to be a good engineer but also the liberal arts that are necessary to teach these good engineers the wisdom of history, to provide the foundation for young students to grow and mature as citizens with responsibilities beyond the immediate technical concerns of their work. And the liberal arts can train a young mind to think critically and discriminately about moral questions—aiding in

the ability to determine what is right and what is wrong. Most engineers are gifted in math and science; this alone is not sufficient to make them responsible or moral human beings.

Peter Drucker, the business consultant who was instrumental in pushing the management team running General Motors to train its managers in the liberal arts, once wrote that "first-rate engineers…tend to take pride in not knowing anything about people. Human beings, they believe, are much too disorderly for the good engineering mind." Perhaps it is time that the engineering profession acknowledged this attitude, and rejected it. We engineers are better and more than the machines we create; we are responsible, not only to ourselves and to our employers, but to our fellow human beings. The humanities offer engineering students the lessons of life and history that are not found in our technical world.

We should not expect to add an entire liberal arts curriculum to the already strained requirements of engineering schools. Nevertheless, there are stratagems we can adopt that will help our students to achieve a more humane education without undermining their analytical knowledge and skills.

First, as engineering educators, we can lead those we instruct by changing the prevailing attitude toward the humanities. We can admit that, although we can create wonders, we don't know everything and we don't have all the answers—that there is far more to wisdom than being able to design an aircraft or create a microprocessor. We can admit that the responsibilities of the engineering profession are far greater than we can easily apprehend when we are lost in a computer screen, enraptured with the expansive yet still critically limited view of the act of technical creation. And we can admit and openly discuss that, in the past, engineers have been responsible for creating many of the problems that we struggle with as a society every day.

Second, we can collaborate with our colleagues in the humanities to structure engineering ethics courses that will interest engineers. Perhaps we need to relate ethics in a way that focuses less on universals and abstractions, and that makes sense to the practical and pragmatic mind. Engineers needn't become great philosophers to appreciate the power, influence, and responsibility they possess as engineers. An engineering ethics course centered on case studies, such as Albert Speer's, could drive home this point. And of course there are many others, of countless kinds: the creation of napalm and the atomic bomb; the *Challenger* and *Columbia* space shuttle disasters; the I-35W Mississippi River bridge and Hyatt Regency walkway collapses; innumerable product-safety recalls; and on and on.

When engineers are presented with situations and stories they can personally relate to, their pragmatic approach to understanding can become much more focused than when presented with abstract philosophical debates that appear to be unending, divorced from reality, and eternally inconclusive to the technical mind. Teaching with real case studies can breathe life into ethical dilemmas faced by other engineers.

Teaching about the specific personalities involved in these disasters may also allow the student to see that there's much more involved in engineering than science and technical skill—that social ramifications, and personal responsibility for them, are integral to everything they design and create. There are many engineers who, like Speer, had extraordinary technical skills but lacked or neglected their capacity for critical judgment. Students could study Henry Ford or Howard Hughes to realize that their true technical genius wasn't enough to make either of them complete men, and that efficiency, pragmatism, and utility all have their limits outside of engineering where, after all, we spend most of our lives.

But while culture and education are surely important for making decent citizens of engineers, one of the essential lessons that we can learn from the story of Albert Speer is that it is the individual technician himself who bears the ultimate responsibility for his work. The need for this responsibility only deepens as society and technology become more complex, allowing the engineer to become progressively more insulated and isolated from the effects of his creations. Prewar Germany, after all, hardly lacked for education and culture; what was needed most direly was the conscience and decency of individual people. "The more technological the world becomes," Speer wrote, "the more essential will be the demand for individual freedom and the self-awareness of the individual human being as a counterpoise to technology."

Hitler and his henchmen inspired the evil that culminated in the Holocaust and the other atrocities of the Third Reich and deaths of World War II. But they were not alone; there were millions who also contributed, either directly by actively participating or indirectly by their silence and disregard. There were engineers, technicians, and architects whose ostensibly amoral technical abilities and organizational capacities supported a regime that nearly brought about the end of Western civilization.

A man who once controlled the productive output of a modern industrial empire later found himself alone in a bleak, cold, gray prison cell, thinking of his past and what went wrong. Albert Speer thought back to a day in the war—the day, in fact, before he was appointed Minister of Armaments—when he found himself lost while traveling through the

frozen Ukrainian countryside, and encountered Russian peasants who helped treat his near-frostbite. They had helped him as a human being who was suffering, not a despised conqueror who was destroying their country. At the time, Speer said, he felt "touched" by their kindness, but simply could not understand it.

Years later, while serving his sentence for crimes against humanity, Speer would begin to finally understand why these Russian peasants acted to help him. Speer was guarded by Soviet soldiers, who he knew must have suffered tremendously during the war. The German war machine—which Speer fed with bullets, tanks, and bombs—killed soldiers and civilians mercilessly and indiscriminately. The Soviets lost nearly 30 million people in the war; of those families that survived, nearly every one felt the pain of a lost family member. Yet among the Russian guards, Speer said, "not one of them bore a grudge toward me." Rather, he "encountered uncorrupted feelings of sympathy, helpfulness, human understanding, feelings that bypassed the prison rules." He then recalled his meeting, long ago, with the Ukrainian peasants who saved him from frostbite. He finally understood what he couldn't comprehend back then: the meaning of genuine human kindness. "I forgot," Speer later said, shortly before the end of his own life, "that humanity is the most important part of life."