
Technological Unions

To what extent did social groups other than technologists, engineers, and scientists incorporate technological prowess into their visions of French national identity? How did they do so, and to what ends? All too often, historical accounts of technological change in the twentieth century confine themselves to the designers of artifacts and systems. We know a tremendous amount about the creation and spread of technological systems, but relatively little about how the people who work in those systems think about technological change and its role in their lives. Yet their point of view is crucial, not only for its own sake but also for the sake of understanding the multiple dimensions of technological change.

Labor union discourse provides a good entry point into these questions. Unions have a powerful voice in French society. From an American perspective, they function almost like political parties: each of the three major unions has a distinct ideological platform, which they rehearse in their public statements and wield in their strikes. The unions have a complex structure: they are organized into national confederations, each including numerous trade federations, which in turn are divided into local sections. For example, the Confédération Général du Travail groups together trade federations for many sectors: electricity and gas, aircraft, chemical, metallurgy, banking, etc. The other two unions also have their own trade federations for each sector. Unions express general ideological positions through their confederations, leaving specific sectoral demands to the federations.¹ It is at the confederation level, therefore, that unions contribute to national political discourse. And it was at the confederation level that unions participated in the national conversation about technology, politics, and national identity in the 1950s and the 1960s.

In chapter 1, I examined how technologists as a group presented a vision of French national identity that revolved around technological prowess. In the present chapter I look at the visions offered by France's

three major labor unions. Just as technologists sought to conflate technology and politics in order to legitimate themselves as creators of the nation's future, so too labor militants conceptualized relationships between technology and politics that would give workers and their unions agency in shaping the nation's future. At times, these conceptualizations criticized (implicitly or explicitly) the visions and actions of technologists. But unions also saw political opportunity within technological development. For them, artifacts and systems had the potential to become vehicles for social change. Their official discourse spelled out how this might occur.

In chapters 2 and 3 I showed that different technologists had different visions of how to conflate technology and politics, which they enacted by shaping distinct technopolitical regimes. In this chapter, I will show that militants in each union also had different ideas about how technology and politics should interact, which in some cases arose from efforts to distinguish their confederation from the other two. In order to understand the positions they articulated, and hence how the range of ideological options available in French society shaped the meanings of technological change, we must grapple with these differences. But while unions were more directly involved in industrial development than other critics of state technologists (such as the social scientists we encountered in chapter 1), they were not in a position to *create* technopolitical regimes. Nor were they on a mission to do so. Instead, militants and other workers had to function within technopolitical regimes. As will be discussed in chapter 5, this necessity tended to erase the differences among the unions as workers struggled to find their place within the nuclear program of the 1960s. Not until the 1970s would the distinctions in how each union conceptualized the relationship between technology and politics reassert themselves.

In the meantime, though, the first step toward understanding labor visions of a technological France lies in examining the ideology of each union and the links that each imagined among technology, politics, national identity. In general, the three unions shared a faith in the promise of technological progress and a belief that the future of France depended on such progress. They did not always agree, however, on what that future should be, or on how technological development might enter into it. For example, all three unions supported the basic concept of national planning. But planning by whom, and under what conditions? For the communist Confédération Générale du Travail, proper planning could not occur in a capitalist society; only a socialist revolution could produce structures that would ensure that planned industrial develop-

ment would benefit the working class. The other two unions adopted a more reformist approach, arguing that participation in existing planning structures, however imperfect, was still better than exclusion. For the CFTC (later renamed CFDT), planning industrial development could provide the means toward a more egalitarian political system. For Force Ouvrière, which claimed to be apolitical, planning could provide an objective means of shaping the future. The three unions also enunciated distinct conceptions of national technological prowess, military nuclear development, and European atomic collaboration. In each case, the ideas expressed by unions both emerged from and further articulated their broader ideological agendas.

The bulk of this chapter explores the articulation of these ideas. Union discourse does not make sense, however, without an understanding of the political layout of postwar French labor. First, therefore, let me sketch out a political map.

The Politics of Unionism

The Vichy government outlawed two bastions of working-class politics: the Communist Party and the Confédération Générale du Travail labor union. Militants were forced underground, and many joined the Resistance. After the liberation, these militants—like other Resistance fighters—became national heroes. In 1944 the reinstated CGT and the Communist Party launched the so-called battle of production, intended as the working class' patriotic contribution to ending the war and beginning national reconstruction. Its goal was to raise production levels in order to defeat Nazism, then ensure postwar national independence through industrial self-sufficiency. Militants asserted that class and national interests had converged during this difficult period, and that, for the sake of both, workers should avoid strikes and stoically pour all their energies into rebuilding the nation.² The CGT thus emerged from the war with impeccable nationalist credentials.

The dominance of left-wing parties in the postwar government initially gave worker organizations high hopes for the future of French social relations. Nationalization seemed to bear out these hopes. In most cases, nationalization entailed a tripartite directorial structure, in which management, workers, and consumers were all represented on the board of directors. Of course, the meaning of nationalization varied significantly for different groups and changed over time, as we have seen in the case of EDF.³ But in the immediate postwar period, nationalized industries

appeared to be concrete manifestations of a new social contract between the working class and the state, and evidence that workers' roles in (re)building the nation would be suitably recognized and compensated.

By 1947 this initial optimism had begun to fade, all the more so as Cold War politics permeated France. Frustration grew over poor living conditions and the lack of basic supplies. Defying the slogans of the battle of production, severe strikes—initially championed by non-communist unions—erupted all over the nation. Communist ministers were dismissed from the coalition government. The Communist Party and the CGT, now firmly in the opposition, denounced the Marshall Plan as an illusion that deceived the French into an unequal alliance with the imperialist United States. Evoking their wartime heroism, communist organizations declared themselves the true and unique defenders of the French national interest.

Although its leadership was dominated by communists, a substantial non-communist minority existed in the CGT before 1947. These two factions had often disagreed. The onset of the Cold War prompted the communist majority to adopt a range of pro-Soviet, anti-American positions, which deeply disturbed the minority. Despite their own sympathies with the Socialist Party, minority leaders strongly advocated the separation of labor unions from party politics. They rejected communist assertions that the only true path to better conditions for the working class passed through socialist revolution and the overthrow of capitalism. Minority leaders maintained that unions had to defend the working class's interests—such as salaries, job security, and benefits—regardless of the political system in place. Their role was not to overthrow that system. Minority leaders had hesitated over supporting the battle of production precisely because it sacrificed traditional union practices (such as strikes) in favor of national political goals.⁴ By the end of 1947, the two groups clashed too profoundly to continue functioning within the same organization. The minority faction split off to form the CGT-Force Ouvrière, an independent confederation.⁵

From then on, Communist Party members dominated the CGT's leadership, and most of the union's positions echoed those articulated by the party. The nation provided an enduring theme for both the party and the union as they strove to articulate a nationalism distinct from de Gaulle's.⁶ Throughout the 1950s and the 1960s, the CGT fiercely and consistently defended the notion of French national independence, by which it meant autonomy from other capitalist nations (especially the United States) and industrial strength relative to Germany. This stance prompted

the denunciation of emerging plans for European cooperation on the grounds that cooperation would threaten French autonomy. CGT militants argued that the Common Market was an instrument of capitalist hegemony that would continue to exploit workers. They insisted that the nation's current industrial structures pauperized the working class. This too they linked to national independence: an autonomous France required a strong working class.

Force Ouvrière leaders defined their union in opposition to the CGT. Rather than link union doctrine to party ideology, Force Ouvrière would be an "independent" union. Force Ouvrière should aim to defend the working class, militants insisted, not to overthrow capitalism. Leaders strongly emphasized their political autonomy. They gave this autonomy roots in the prewar history of French unionism and claimed that it made Force Ouvrière a more legitimate labor union than the CGT. Did autonomous really mean apolitical, though? The answer depends on the meaning of "political." In the narrow sense of party and revolutionary politics, militants repeatedly professed that union actions were fundamentally apolitical.⁷ They could not deny their sympathies with the Socialist Party, but they contended that these stemmed from nothing more than "converging opinions."⁸ Politics in the broad sense (especially anti-communist rhetoric) seemed acceptable, however, and many militants did articulate positions on several national and international issues, most notably European cooperation. Force Ouvrière viewed a united Europe as the only realistic alternative to the spread of Soviet communism (a point on which the union and the Socialist Party "converged"). It supported proposals to institutionalize European cooperation and called for the participation of European labor unions in managing these institutions.

The other major non-communist union, the Confédération Française des Travailleurs Chrétiens (CFTC), had roots in late-nineteenth-century Christian trade unionism. Many of its leaders sympathized with the left-wing Christian Democratic party. Again, there were no official ties between the two organizations; in fact, the union's rank-and-file tended to vote more to the right. In the 1940s, the CFTC contained two major subgroups: a majority who wanted to retain the union's Christian orientation and a strong minority, led by the Reconstruction group, who wanted to abandon references to Christianity.⁹

Despite its minority status, Reconstruction was extremely active in shaping the union's policies—for example, by successfully promoting the notion of *planification démocratique*, an approach to national planning that would give the working class a greater role. The issue of whether to

remain explicitly Christian dominated internal union debates in the early 1960s, as increasing numbers of militants expressed interest in secularizing. In 1964, after extensive debates, reports, and questionnaires, members voted to change the union to the Confédération Française Démocratique du Travail (CFDT). Around 60,000 members refused to endorse the change; they split off and retained the union's original name. Most members stayed, though, and after 1964 the union faced the difficult problem of defining its identity and establishing its legitimacy. (I will not discuss the post-1964 CFTC. In order to make my argument easier to follow, therefore, I will henceforth refer to this union as the CFTC/CFDT.)

Like Force Ouvrière, the CFTC/CFDT rejected the pro-Soviet communism of the CGT. But unlike Force Ouvrière, it did seek an explicitly political, ideological anchor. CFTC/CFDT militants did not find Force Ouvrière's pragmatism congenial. Many retained a strong sense that moral, humanist values had to underlie any CFTC/CFDT position. Thus, for example, their fascination with modernity was often accompanied by denunciations of crass consumerism. At first, the notion of democratic planning provided an ideological anchor. In the late 1960s, particularly during and after the 1968 strikes, the notion of *autogestion*—self-management—began to supplant democratic planning. The fundamental goals of both were the same: the leveling of social class and the participation of workers in managing not only businesses but also the nation. The degree to which individual militants believed that such a shift should entail a fully socialist system varied considerably.

The politics of French labor unionism were thus fractious and complex. Each of the three major unions identified with a different flavor of left-wing politics. For historical as well as ideological reasons, the unions had difficulty cooperating. Both Force Ouvrière and the CFTC/CFDT perceived the CGT as a mammoth organization whose dominance had to be actively resisted. Force Ouvrière not only opposed the CGT's ideological stance but also suspected that the communist union's offers of cooperation were imperialistic attempts to recapture Force Ouvrière members. After secularization, the CFTC/CFDT became more amenable to cooperating with the CGT. In the mid 1960s these two unions—while retaining fundamental ideological and strategic differences—developed a common platform. In the late 1950s, meanwhile, some members of Force Ouvrière had begun to consider a rapprochement with the CFTC's Reconstruction group. After 1964, however, Force Ouvrière pulled back, viewing the newly secularized CFTC/CFDT as a direct competitor for the

attention of non-communist workers. Such inter-union politics often helped to shape the positions adopted by militants.

Quantifying the constituency of these unions in the 1950s and the 1960s is notoriously difficult. Many social scientists do not trust the figures provided by the unions, but there appear to be no reliable surveys for this period. Furthermore, membership figures do not tell the whole story. Most workplaces had at least one committee devoted to personnel issues and composed of elected representatives. Most representatives were union militants, but those who voted for them were often simply union sympathizers.¹⁰ Despite these problems, we can still offer a rough distribution. The CGT remained the largest labor union in France, with a membership of around 2 million workers in the 1960s. The CFTC/CFDT was the second largest union in France, with a membership of roughly 600,000. (Its numbers dropped in 1964, but climbed again during the rest of the decade.) Force Ouvrière did not lag far behind; its membership stayed around half a million throughout the 1960s.

The two institutions of the nuclear program had somewhat different numbers. EDF proportions roughly followed national figures. The CGT dominated EDF, garnering about 60 percent of the vote in personnel elections throughout the 1960s. After the war the CFTC/CFDT attracted only 10 percent of the vote in EDF, but by the mid 1960s this number had risen to around 20 percent. Force Ouvrière's popularity remained around 15 percent throughout this time period. CEA proportions differed significantly from the national figures. Despite the communist purges, the CGT won 30 percent or more of the vote there throughout the 1950s (though the CEA's military sites, including Marcoule, did not allow the CGT to establish local sections until the 1960s). By the mid 1960s, however, the CGT vote had dropped to 18 percent. The CFTC/CFDT benefited from this change: its popularity grew from 20 percent in the late 1950s to nearly 40 percent by the mid 1960s. Force Ouvrière hovered around 15 percent throughout both decades. About 30 percent of CEA employees voted for an independent union of nuclear workers that had no nationwide confederation.¹¹

Conceptualizing National Technological Progress

None of the three unions fundamentally challenged the concept of a technologically radiant France. In some cases, they even used the same rhetorical archetypes as state technologists, such as France's backwardness, or the Malthusianism of private industrialists. But sharing a fundamental

Table 4.1

Unions' political affiliations and positions on selected issues.

	Political sympathies/ nationalist outlook	Position on French nuclear strike force	Position on Euratom	Conception of relationship between technology and politics
CGT	Communist/ nationalist	Strongly against	Strongly against	Straightforward: Technology is a political tool. Its development must be directed by nationalized companies in order to prevent capitalist exploitation and engender socialist revolution.
Force Ouvrière	Socialist/ internationalist	Mostly silent	Strongly in favor	Tension: Technology is inherently neutral and apolitical. At the same time, it can lead to an internationalist future.
CTFC/ CFDT	Christian Democrat/ blend of nationalist and internationalist	Against	In favor	Complex and ambivalent: For some, technology is uncontrollable and oppressive. Others argue that its development can and must be shaped by humane values.

belief in the political, economic, and cultural importance of technological progress did not mean sharing state technologists' visions of France's future. Instead, each union conceptualized national technological progress in terms of its political framework.

In the 1950s and the 1960s, most union discourse about technology did not address the relationship between technological change and workplace experience directly. Except for a few scattered discussions of automation,¹² most discussions of technology centered on national industrial development and its relationship to the sociopolitical order. In this regard, the CGT and the CTFC/CFDT envisioned a nation different from what most state technologists had in mind. For the CGT, technological development

could pave the road to a socialist society. For the CFTC/CFDT, it opened the way to greater worker participation in running the nation. (To some this meant a socialist system; to others it did not.) True to form, Force Ouvrière did not link technological change to France's internal socio-political order. But its militants did argue that technological development could help situate France within an international cooperative framework that would strengthen the nation. These three visions of technology were entwined with different pictures of how technological development occurred, the extent to which it could be controlled, where its potential lay, and how it mediated or represented the place of workers in the French nation. In these pictures, technology appeared sometimes as a thoroughly (and desirably) political entity, at other times as an unstoppable deterministic force, and sometimes even as both.

For the most part, I have limited my discussion to discourse published in official union newspapers, magazines, and journals. This discourse represents the unions' official platforms, and thus their formal contributions to national debates. It suffices for my purpose here, which is simply to outline the alternative visions of technological France offered by labor. A word of caution, however, to those interested in internal union affairs: these sources tend to mask differences within each union. This is particularly true for the CGT and Force Ouvrière, whose confederation publications created the illusion of internal unanimity; it is less true for the CFTC/CFDT. For those not familiar with French labor politics, table 4.1 offers a rough guide to each union's position on the questions examined here.

The CGT: National Independence through Technology

The CGT's representation of technological progress—like its politics more generally—was the least ambiguous. Technology, for CGT militants, was crucial for the future and independence of the nation. But not just any form of technology would do. The right people had to control technological development. In the hands of capitalists, it served as merely another tool of exploitation. In the hands of workers or of nationalized companies, it could lead to the economic growth and political prestige that France craved.

Like state technologists, CGT militants appropriated the postwar trope of "Malthusianism" to make this point. Militants did not give this notion a very specific meaning. "Malthusianism" functioned as a shorthand for evil French capitalists who shunned modernization in order to preserve their economic power. In a speech to technologists and political scientists at the 1958 "Politique et Technique" conference, CGT Secretary Pierre

Le Brun denounced the continued existence of an industrial class that was “fundamentally anti-progressive and Malthusian and for whom technology is essentially a way to push the exploitation and domination of others even further.”¹³ Eight years later, the CGT militant Henri Beaumont accused “Malthusian” electronics firms of curtailing research that would enable France to remain independent of the American electronics industry.¹⁴ In the first case, “Malthusian” behavior consisted of using technology to exploit workers. In the second, it consisted of impeding the realization of national independence through technological development. In both cases, “Malthusianism” gestured toward inappropriate forms of technological development. Good technology, for these CGT militants, could only come from good politics. “Labor syndicalism,” Le Brun wrote, “can only wish for a fruitful interpenetration of politics and technology, [and] for political deliberations and decisions to be enlightened and enriched by all that technology can bring to them.”¹⁵ The right blend of technology and politics would lead to improved working conditions, higher pay, and better scientific and technical education. Beaumont focused on national politics. Private firms, he argued, could not be entrusted to do research in the French national interest. A nationalized electronics industry was “an imperious necessity for a nation that wants to be independent and not depend on foreign [nations], in this case the USA.”¹⁶

The CGT’s analysis of technological change proceeded on this dual front of social and national politics, often conflating the two. Articles in *Le Peuple* and *La Vie Ouvrière* showered praise on French technological achievements.¹⁷ The only major difference between the CGT’s praise and that of state technologists was that the union usually included some mention of workers. Witness this 1957 ode to a new suspension bridge: “Magnificent work of art in a grandiose natural setting, the bridge of Tancarville bears witness to the worth of French technology. It will bring honor to the engineers, technicians, and all the workers who will have worked on it.”¹⁸ Most worthy of praise were the achievements of the nationalized companies. SNCF and EDF workers received frequent acknowledgment in the pages of the CGT’s publications, as did the technological systems that they created. Such articles also provided an occasion to indict the capitalist system. In 1967, EDF’s Rance power plant was described as “a prowess that owes nothing to men of money: the tidal power station of the Rance [is] the first in the world to have domesticated tidal energy.”¹⁹ Similarly, the success of the Caravelle commercial airplane—which even an American airline pilot, capitalist though he was,

admitted was “the best [he’d] seen in 27 years of flying”—was due to the nationalized status of its manufacturer, Sud-Aviation.²⁰ Renault, meanwhile, had pushed “the avant-garde of technology” since its nationalization in 1945.²¹ Its postwar achievements demonstrated the “vitality and ingenuity of French technology and science, despite the terrible handicap of four years of occupation.”²²

CGT militants thus privileged national independence every bit as much as Gaullists, albeit from the other end of the political spectrum. Both representations of the nation shared referents (the Occupation), and both groups derived legitimacy from similar credentials (the Resistance). But CGT militants constructed a somewhat different association between technological prowess and national identity. They juxtaposed praise for French technology with indictments of capitalism, support for nationalized companies, and commendations for workers. Technological radiance thus derived from the political superiority of nationalized industry and the labor of French workers. Even when they accused state technologists of perverting the original social mission of nationalization, CGT militants continued to fantasize about the revolutionary possibilities of nationalized structures. The technologies produced therein were inherently better, and more national, than those produced by private companies. When the confederation’s press did evoke the technological achievements of private companies, it did so as a way of indicting capitalism and praising worker contributions to French grandeur. For example, when the “the atomic millipede” (the convoy that brought heat exchangers to the Marcoule reactors) caught the imagination of mainstream journalists, one CGT militant wrote caustically: “Fine. Let us also applaud this beautiful achievement of French science and technology.” But, he continued, who applauded the men who had built these huge machines with their hands? “It’s an old habit of the ‘free, objective,’ etc., etc., mainstream press to ignore systematically those . . . whose work is at the base of national wealth.”²³ For the CGT, French grandeur thus rested on nationalized companies and the labor of workers.

The CGT thus did not challenge either the concept of grandeur or its link to technological prowess. But it did challenge the manifestation of this link in de Gaulle’s *force de frappe*. Following the lead of the Communist Party, CGT militants vociferously opposed the construction and testing of atomic weapons and supported the “peaceful use” of atomic energy. Militants rested their arguments on the same concept that nuclear leaders and de Gaulle used to promote both the military and the civilian nuclear program: the radiance of France. For the CGT, however, only

peaceful uses of atomic energy would enhance French grandeur: “The prestige of France would be considerable among peoples the world over if it took a solemn decision to devote itself uniquely to peaceful applications of atomic energy.”²⁴ Furthermore, military uses bolstered the capitalist system: “It is obviously impossible to place useful industrial applications, like the production of electricity from a new source of energy, on a par with the manufacture of the most murderous war machines ever. The development of modern technology opens remarkable possibilities for man, but the use to which the capitalist world puts [this technology] has nothing to do with improving the living conditions of the people.”²⁵

In making such arguments, CGT militants frequently invoked Frédéric Joliot-Curie, a communist and a member of their union. Recall that American pressure had led to Joliot-Curie’s dismissal from the CEA in 1951, after he publicly refused to build a French atomic bomb. For the CGT, this dismissal elevated the scientist from a Resistance hero to a martyr.

Joliot-Curie’s name legitimated CGT writers by enabling them to appropriate French nuclear history. The confederation press portrayed Joliot-Curie, his wife Irène, and his in-laws Marie and Pierre Curie as heroes of French science. A series of articles in 1956 told the story of this great scientific dynasty, emphasizing the hardships imposed on the family by the French state.²⁶ “On three black canvas notebooks, Pierre and Marie Curie recorded the phases of a discovery that would completely change humanity. They had the right to the gratitude of the Nation. But the State did not give them the decent working conditions for which they had hoped. In order to obtain them, they had to struggle.”²⁷ In the next generation, the struggle became overtly political: Irène was part of Léon Blum’s leftist government before the war, and “Fred” (the nickname indicated camaraderie) joined the clandestine Communist Party during the war. The whole French nuclear power program was a “great idea advocated as of 1945 by Frédéric Joliot-Curie.”²⁸ Rehearsing this triumphant history of French nuclear efforts made that history into a communist morality play and asserted the CGT’s right to pronounce on the future of the program. History averred CGT workers as the moral and material guardians of the French nation.

This history also legitimated the CGT’s accounts of the devastating effects of nuclear explosions. Militants gave horrifying descriptions of victims of Hiroshima and Nagasaki and accounts of US testing in the Pacific. Bringing the matter closer to home, one writer exclaimed: “AN EXPLOSION LIKE THE ONE IN THE PACIFIC WOULD DESTROY ALL OF

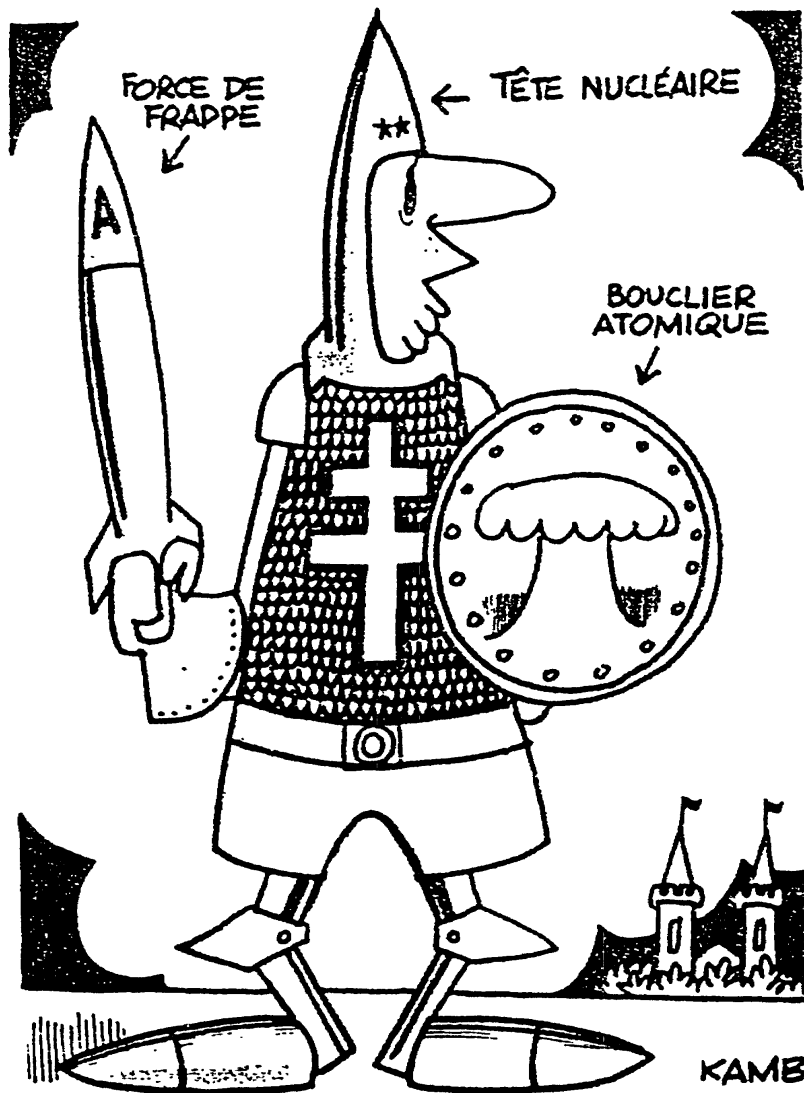


Figure 4.1

Charles de Gaulle and his nuclear armor. This cartoon appeared in the 8 January 1964 issue of CGT's weekly, *La Vie Ouvrière*. Courtesy of Henri Sinnot, Institut d'Histoire Sociale, CGT.

PARIS [and its] GREATER SUBURBS ALL THE WAY TO MANTES, MELUN, FONTAINEBLEAU: SIX MILLION DEAD."²⁹ None mentioned the Soviet weapons program. To those who wondered whether the union should expend so much effort on a political (rather than a specifically working-class) question, one militant responded that the defense of peace concerned union members on all possible fronts: as humans refusing to condone suffering, as proletarians refusing fratricidal struggles with workers in other nations, as producers who did not want the fruits of their labor hijacked for nefarious purposes, as consumers who would find the

money better spent on higher salaries and improved housing, and as citizens for whom war was a basic violation of democracy. In short: "There are no longer any questions that are purely 'syndical' or 'economic.' Everything is imbricated."³⁰

Indeed, militants argued, de Gaulle's aspirations to a *force de frappe* were immoral not just because of the inherent immorality of atomic weapons but also because money spent on them came from housing, food, schools, hospitals, or more beneficent industrial development. France's world technological standing had suffered: "A century ago, one out of every two engineers in the world was French. Today, only one out of fifty is French."³¹ De Gaulle's military aspirations were anti-modern: "To be part of our times, we must disarm, not arm."³² A cartoon showing de Gaulle in medieval armor (figure 4.1) illustrated this message. Gaullist military ambitions hurt even the civilian nuclear power program. Making the same argument as many EDF engineers, one CGT writer noted that using Chinon's reactors to make weapons-grade plutonium prevented those reactors from producing the power, and engineers from gaining the technical experience, that France needed so badly. "The grandeur of a country," he asserted, "is measured by its economic power and its intellectual radiance; Gaullist chit-chat on the grandeur of France through the *force de frappe* is terribly weak."³³

The independent pursuit of technological prowess also meant that France should not join forces with other European nations in industrial matters. Specifically, it should not sign the Euratom treaty for cooperative nuclear development: "Euratom is merely the fashionable word to camouflage the small Europe of six, the Europe of the Atlantic pact and German hegemony."³⁴ Euratom would only help German rearmament by assisting German industry. Ultimately, Euratom represented a kind of treason, both because it would lead to German dominance and because it would upstage France's own nuclear program³⁵:

[Euratom's] family council is dominated by Aunt Germania. . . . France, the largest producer of uranium in Europe, would thus deliver raw and refined minerals, information and technologists, and its overall technical experience to the other nations, but essentially to Germany. This would be a new Kollaboration, still in one direction only. . . .

It is the partisans of Euratom who have hindered the spread of large hydro-electric dams, who have closed the mines, who have delayed oil prospecting in France, who removed Joliot-Curie from Atomic Research and who denied substantial funding for the peaceful production of atomic energy.³⁶

Thus, for the CGT, technology was thoroughly political. It was not a neutral feature of the social order. Capitalists used technology as an instru-

ment of exploitation. Military technological development would drain resources from social programs (and threaten the USSR, though union militants tactfully left this point to their colleagues in the Communist Party). But, properly developed by truly nationalized companies (i.e., companies that did not secretly serve capitalist interests), technology could provide the route to national independence. And, championed by peace-loving scientists, it could contribute to the radiance of France.

In the end, the abstract dimension of the CGT's conceptualization of the relationship between technology and politics strongly resembled that of many state technologists. For both, conflating technology with politics provided a means to extend their political purview and legitimacy. But the difference in their political program mattered. For CGT militants, conflating the two provided a way to stake out a place for the union and for the working class in the modernizing nation. From this place, true credit for French technological prowess went to workers, especially those who worked for nationalized companies. And from this place, the representatives of the working class could lay out their program for national technological development.

Force Ouvrière: International Cooperation through Apolitical Technology

For the CGT, good politics produced good technology, and vice-versa. In contrast, at the foundation of Force Ouvrière's supposed lack of ideology lay the claim that it did not pursue politics. Under these circumstances, the union could hardly propose technology as a political instrument. Instead, Force Ouvrière followed the pattern it had established for so many of its positions and did the opposite of the CGT: it attempted to portray technological development as fundamentally neutral. Technological progress itself was "collective, universal, and irreversible."³⁷ Only its social effects were subject to control. "If we know how to handle it, technological progress can be the cause of a happier life, of a new stage of social progress, of human progress."³⁸ Technological change was the "fundamental fact of our era. As the result of intelligence and know-how, in this century it has attained an unparalleled . . . rhythm of development. We often hear that it contains the potential for the best and the worst. . . . Social progress will march to the same beat as technological evolution, or there will be no social progress."³⁹ For Force Ouvrière, "social progress" was an apolitical concept, in the sense that its achievement was not tied to a specific political system or party: capitalism could lead to social progress as easily as socialism. In this scheme, technology, disembodied and neutral, set the beat. Militants had to concentrate on ensuring that workers

benefited from technological change; they should not waste time fighting the system which produced that change.

Force Ouvrière's representations of technological prowess often deemphasized national origins in favor of an internationalist vision—again, in reaction against the CGT. Militants did portray technology as central to France's future, but they situated both technological change and the nation's future in an international context. The union's press managed this by focusing on the technical and scientific details of industrial systems. Concentrating on these supposedly neutral details made technology appear apolitical, universal, and international. Through artifacts and systems, France could become a player in new types of international collaborations. So while national achievements mattered in Force Ouvrière's discourse, their significance derived primarily from their ability to make France part of a trans-national, post-political, non-communist system.⁴⁰ Force Ouvrière's representations thus contained a fundamental tension: on the one hand, militants claimed technology was apolitical; on the other, they saw it as the conduit to an internationalist future. This tension came from a parallel tension in their ideology: while Force Ouvrière supposedly did not engage in politics, its anti-communism and its internationalism constituted an undeniably political stance.

Force Ouvrière's internationalism shaped its rendition of nuclear history. Its version of this history contrasted sharply with the CGT's. Articles that discussed specifically French nuclear research ignored Frédéric Joliot-Curie—even when describing the experimental reactor that he masterminded.⁴¹ But the union's enthusiasm for nuclear development certainly matched that of its communist nemesis. Exuberant predictions about the social, economic, and medical benefits of nuclear technology filled the pages of FO's weekly newspaper, especially in the mid to late 1950s.⁴² What mattered for Force Ouvrière was the effect of technology, not its sociopolitical origins.

In view of this consciously trans-national approach to technological development, it will come as no surprise that Force Ouvrière ardently supported the Euratom treaty. Euratom was "a vital and urgent necessity for France and for Europe. Our syndicalist movement has committed itself to this without reticence."⁴³ In the rhetoric of Force Ouvrière militants, Euratom transcended politics because it transcended the nation. Atomic energy spurred industrial development: nuclear plants provided the energy required for development in other sectors and offered a new market for existing sectors (such as the chemical or metallurgical industries). A single nation the size of France did not have the resources to build a truly

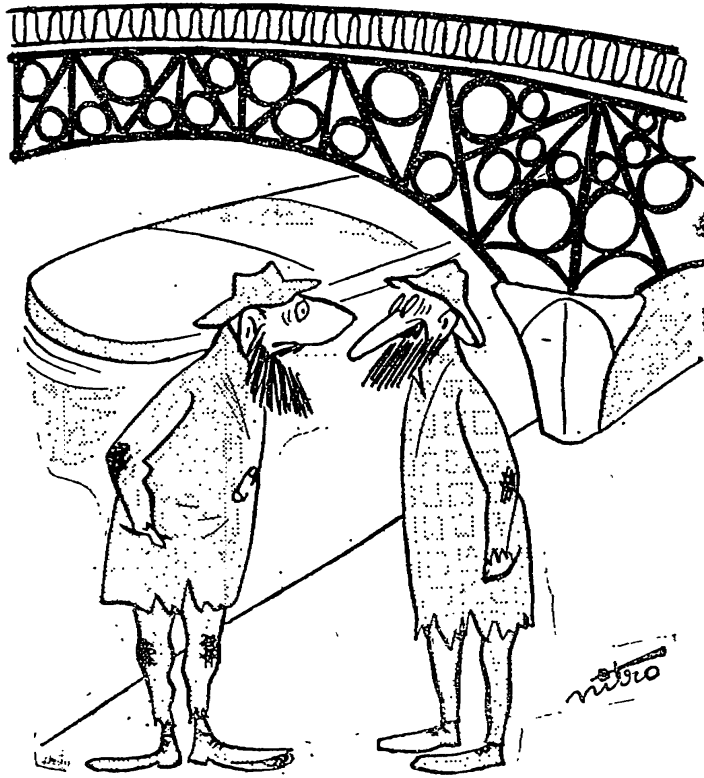


Figure 4.2

A cartoon from the weekly *Force Ouvrière*. One man says to the other: “Do you think that with the atomic bomb we will no longer be a ‘diminished great power’?” Courtesy of Jean-Pierre Alliot, *Force Ouvrière*.

competitive nuclear program; it could never compete with the superpowers. To succeed in this domain, European countries had to work together. Euratom would leave petty nationalisms behind and would result in improved economic development for all. By getting involved, *Force Ouvrière* and other European labor unions could ensure that workers’ health and safety concerns were incorporated into the fabric of Euratom’s institutions. They could also join the inevitable discussions of labor markets that accompanied all efforts to institutionalize European cooperation.⁴⁴ Euratom thus represented an ideal example of neutral technological development that promoted international collaboration, not just among industries, but also among labor unions.

With so much attention to Euratom, *Force Ouvrière* had little energy left for France’s national nuclear program. Occasional articles mentioned French power reactor sites, but usually tangentially. *Force Ouvrière* had quietly supported de Gaulle’s return to power in 1958, largely because it viewed Gaullism as the only viable alternative to fascism and communism.

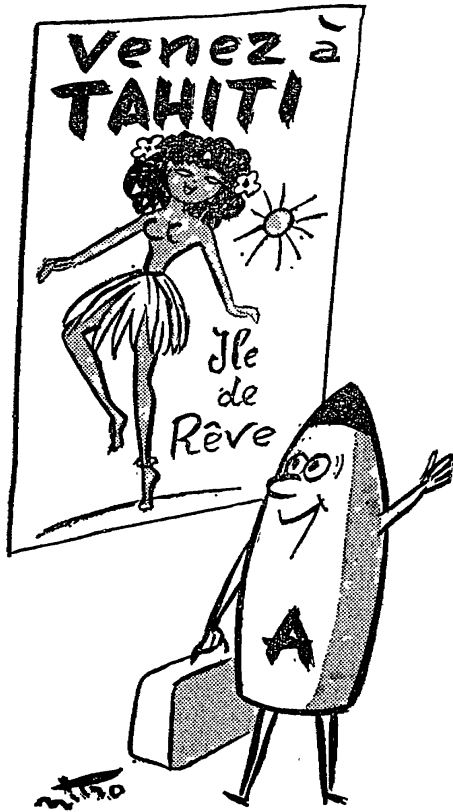


Figure 4.3

Another cartoon from *Force Ouvrière*. The poster proclaims: “Come to Tahiti, Dream Island.” The atom bomb responds cheerfully: “Here I come!” Courtesy of Jean-Pierre Alliot, *Force Ouvrière*.

When de Gaulle announced the *force de frappe*, *Force Ouvrière* remained silent—perhaps because of its tacit support for de Gaulle, or perhaps to differentiate itself even further from the CGT. The only acknowledgment of the atomic arsenal appeared in a couple of gently mocking cartoons in the weekly *Force Ouvrière* (figures 4.2, 4.3). According to one editor, such oblique references provided the only manner in which editorial policy could differ from confederation policy.⁴⁵ These images aside, the weekly presented a benign view of the military atom. Fallout from nuclear testing had not been too noxious. Good protection against radioactive exposure existed. “This new industry, in constant evolution, does not neglect to elaborate its own safety regulations.”⁴⁶

Force Ouvrière’s cultivated abstinence from French politics supposedly freed militants to focus on workers’ issues. Indeed, in the mid to late 1950s *Force Ouvrière* writers paid considerably more attention to workplace conditions in the nuclear industry that did the CGT. Again, though, *Force*

Ouvrière did not focus on French nuclear workers per se. Instead, the union presented reports on studies conducted by the international labor organizations to which it belonged.⁴⁷ It expressed optimism about the atomic industry's working conditions. Though the industry could certainly benefit from "a good syndicalist education," it was, writers claimed, also one of the least dangerous, because of a heightened awareness of its potential risks.⁴⁸

Force Ouvrière's press did sometimes praise specifically French technological prowess. But on these relatively rare occasions, it usually either dissociated technology from politics or situated the value of France's achievements in an international framework. (Sometimes it did both.) One article in the weekly *Force Ouvrière* praised the dams, bridges, and airports built by French engineers in Africa and South America. It explained that "sympathy for underdeveloped countries seeking to establish their economic progress on solid, independent foundations" constituted a "salient trait of the export of our engineering knowledge." France could help other nations precisely because its technology was apolitical. "France can guarantee independence to the countries which appeal to its engineers [for aid], *because our technologists do not double as politicians or propagandists.*"⁴⁹ Force Ouvrière even located the success of France's *nationalized* industries in an international context. One article praised EDF for the high-voltage transmission lines it had built to Germany, Switzerland, Italy, and Spain. What was good for Europe was good for France. "National egoism would be ridiculous and disastrous. Whether we like it or not, the people of Western Europe are linked by these interconnections. The flag of Europe flies above the high-tension networks. And Electricité de France steadfastly pursues its work in the service of our economy, the French economy of tomorrow."⁵⁰ Even these mild patriotic outbursts thus situated French national identity firmly within a united Europe. Technology would literally bind France to the rest of the continent.

This did not mean that the sole virtue of nationalized industries stemmed from their role in European cooperation. Nationalized industries mattered for France too. Their significance, however, derived not from their revolutionary potential but from pragmatic considerations. The public sector furnished the most economically rational means of developing industry, which meant that it provided the best means of promoting the material interests of the working class. EDF and the SNCF garnered the most praise in these domains, and Force Ouvrière argued that the oil industry and other sectors should follow their example. In one respect, of course, such arguments in favor of spreading nationalization

resembled those of the CGT. But there was a crucial, if subtle, difference. The CGT located the importance of nationalized industry in the domain of political ideology. Its interpretation of nationalized achievements portrayed technology and politics in a mutually constitutive relationship. Force Ouvrière located the importance of nationalizations in the domain of economic and social rationality, a notion that essentially referred to the standard of living. Its depiction of nationalized achievements located the motor of economic and social progress in technological development.

In a sense, maintaining a careful separation between technology and politics provided the only doctrinally justifiable means for Force Ouvrière militants to pronounce on technological matters. The confederation's identity rested on the official rejection of national party politics. Conceiving of technological development as political in any deep sense would therefore remove technology from the union's self-defined purview. Witness Force Ouvrière's official silence on the *force de frappe*, a technological system no one could legitimately label apolitical. European industrial cooperation—which for the CGT carried a heavy political charge—appeared neutral in Force Ouvrière's press because it was trans-national. Only by portraying technological development as neutral could Force Ouvrière militants justify discussing it.

Force Ouvrière's discourse implicitly rejected the notion of French grandeur. For Force Ouvrière, however, French national identity was still bound up with technological development. France's future rested with its ability to develop industrially in an international context. Technology would bind the nation to the rest of Europe, and the working class would help that process. Once again, the portrayal of the relationship between technology and politics served to delineate a place for the union in shaping the nation's future.

The CFTC/CFDT: Complex Relationships between Technology and Politics

Both Force Ouvrière and the CGT offered fairly unambiguous portrayals of technological change in their publications. Analytic differences aside, militants for both confederations expressed little uncertainty or ambivalence about technology's value and its place in French society. In contrast, CFTC/CFDT representations of technological change appear more fragmented. The main reason is that this union made more space for conflicting voices within its ranks; indeed, it consciously differentiated itself from the other two unions by proudly incorporating dissent and dialogue in its official discourse. One manifestation of this breadth was the larger

number of union-sponsored publications, in which militants could express a wide range of opinion.⁵¹

The pages of CFTC/CFDT publications offered a correspondingly broad range of representations of technological change. Some writers portrayed technology as ineluctable and uncontrollable. “Self-nourishing,” said one militant, technological progress “contributes to its own acceleration and expansion.”⁵² For this author, the outcome of technological change remained uncertain. A similar uncertainty transpired in a special issue of the weekly *Syndicalisme* entitled “Industrial modernization: menace or hope for the world of work?” Would technological progress lead to unemployment or reskilling? Oppression or liberation? The answer was often mixed. Ambivalence also accompanied descriptions of technological prowess. *Syndicalisme* covered the same prowesses as did the CGT press: electronic calculators, the Tancarville Bridge, and the SNCF’s rail system all received attention. And even more than the CGT, CFTC/CFDT militants argued that success in these domains rested on the workers.⁵³ But focusing on the “human dimension” of technological change, they raised anxious questions about the benefits of modernization. Even the most sanguine writers—such as Pierre Papon, who believed that science and technology were “factors of the *national independence* of a country”⁵⁴—evoked the dangers of pursuing progress unreflectively, and spoke of the need to elaborate socially responsible development policies.

The CFTC/CFDT’s approach to the atom exemplified the ambivalence of its militants toward technological change. Atomic achievements appeared as the paragon of modernity in CFTC/CFDT publications, much as they did in the other confederation periodicals. Nuclear matter carried the potential of tremendous social and economic change. “A kilo of Uranium—smaller than a pack of Gauloises—would suffice to drive an atomic train around the world five times,” affirmed one article. Nuclear technology could improve food preservation and thereby offer creative solutions to world hunger. “So let us hope that the face of the world will be changed and that every man, every woman, and every child will know new living conditions.”⁵⁵ The CFTC/CFDT also expressed pride in specifically French atomic achievements: “With G1, France has attained industrial atomic achievement, the essential mark of the modern era.”⁵⁶

But unsavory incidents within the nuclear program tempered such hope. In early 1956 *Syndicalisme* reported on a labor relations incident on the Marcoule construction site involving a private contractor. It was well known by this time that workers who applied for jobs at Marcoule had to

undergo a security check designed to keep communist sympathizers off the site. The contractor had apparently tried to recruit local farmers, hoping that such men would have little interest in party politics of any kind. Once workers had signed on, the contractor went further and tried to prevent them from unionizing. Complaints to the Ministry of Labor did little to improve labor relations on the site. Management countered a 25-day strike by hiring scabs and bringing in the police. Despite the marvelous technologies under construction (in 1956 the CFTC/CFDT still labored under the illusion that these reactors had civilian destinies), Marcoule had become “the site of fear.”⁵⁷

Nearly twenty years would pass before the union would make nuclear safety a national cause célèbre. But militants began discussing workplace issues in the late 1950s. Some called attention to the same international studies that Force Ouvrière cited.⁵⁸ Others focused on French efforts to understand the nuclear workplace. In 1958, the CFTC/CFDT militant Alfred Willame presented a report to the state’s Conseil Economique on technical, financial, and regulatory aspects of radiation protection. Formulated in general terms, the report described the risks of radiation exposure and outlined the measures required to deal with these risks. These included training nuclear personnel in safety practices; defining hours, leave times, shift rotations, and a retirement age appropriate for atomic workers; and measuring radiation levels in the workplace and around nuclear sites.⁵⁹ The report won the unanimous approval of the Conseil Economique et Social, which forwarded its recommendations to the government. In 1960, another militant recalled Willame’s report and described the operation of health and safety commissions on EDF’s first nuclear site at Chinon. I shall examine the CFTC/CFDT’s involvement with specific nuclear workplace issues in greater depth in chapter 5. For now, the point is that the CFTC/CFDT, however sporadically, paid greater attention to these matters than did the other two confederations—perhaps because it deliberately encouraged militants to exhibit greater creativity and independence of thought. In any case, the French nuclear program appeared neither as a disembodied symbol of glory or perdition nor as a weak precursor to more ambitious international efforts. Instead, it was represented as a complex industry, rich in positive symbolic value yet facing real difficulties.

The CFTC/CFDT also straddled the other two unions on matters of nuclear policy, coming out both in favor of Euratom and against the *force de frappe*. Though somewhat less enthusiastic than Force Ouvrière, it made similar arguments in favor of Euratom. Supporting the interna-

tional endeavor did not, however, lead its writers to dismiss the national program.⁶⁰ Initially, the CFTC/CFDT situated its opposition to the weapons program in the context of Christian peace doctrines.⁶¹ As the union moved toward secularization, writers increasingly associated this opposition with that of the moral scientist. Despite their clear desire to maintain a safe distance from the CGT, CFTC/CFDT writers made many of the same arguments as their communist counterparts—albeit in a more detailed and technically sophisticated manner.⁶² Rather than merely claiming that money spent on the *force de frappe* robbed worthier causes, for example, unionized scientists and technicians from the CEA's Saclay research center presented careful calculations to demonstrate the precise economic effects of pursuing the military atom.⁶³ CFTC/CFDT militants also argued that French prestige was better served by peaceful economic development within a European context. They thereby conflated arguments for European cooperation with those against the *force de frappe*:

... these days independence is in fact more tied to healthy economic structures, high scientific and technical potential, and a certain cultural radiance. In other words, the independence of France and of Europe rest much more on their ability to oppose American economic penetration than on the installation of an autonomous defense system that is ineffective and ruinous.⁶⁴

While the CGT wanted a France autonomous from all other Western nations, the CFTC/CFDT situated the nation in a third political space that would resist both superpowers. France would derive radiance from an alliance with the rest of Europe that focused on peaceful technological development.

Technology thus appeared as a double-edged sword. It was certainly not apolitical, even though the CFTC/CFDT (like Force Ouvrière) claimed to be above party politics. For the CFTC/CFDT, rising above party politics did not mean eschewing politics altogether. Its militants did not shrink from viewing Euratom, national sovereignty, or nuclear policy as broadly political matters that legitimately demanded their involvement.⁶⁵ At the same time, though, the politics of technological change was more nebulous for the CFTC/CFDT than for the CGT. CFTC/CFDT militants did not label technologies as good or bad based on institutional or political provenance. Rather, technological change appeared as a messy process over which unions and workers had uncertain and uneven control.

Nonetheless, the CFTC/CFDT clearly considered technological development to be central to modern society, and to require deep examination. This attitude became particularly apparent in the internal debate

preceding the union's secularization. A commission established in 1960 to discuss the union's ideological future polled leading militants on four basic questions. Here is the first of these:

In order to better accomplish its syndicalist mission, what are the essential problems that the CFTC needs to confront in the areas of:

- a) French realities
- b) the intersection of the social, the economic, and the political
- c) the increasingly international aspect of all issues
- d) technology
- e) consumer culture⁶⁶

A report based on the answers went out to every CFTC/CFDT local along with another, similar questionnaire. Every union member thus had the opportunity to express an opinion on these matters.

The responses to these questionnaires are preserved in the CFDT's archives. At first, they appear to provide a unique source, an expression of what these unionized workers "really thought" about technological problems in the abstract. Yet, while local militants did provide their own opinions, many of their answers echoed—and sometimes copied exactly—the ideas articulated in the report. As the historian Frank Georgi argues,⁶⁷ the questionnaire answers are better read as the means by which union members participated in the building of a collective identity rather than as a pure reflection of their raw opinions. The responses, therefore, cannot be understood separately from the report.

The report painted a bleak picture. Technology presented a tremendous threat of alienation. It could crush workers and rob them of their individuality. Radically new technologies changed class structure by requiring more skilled workers and technicians and fewer manual operatives. Such changes could lead to layoffs, the "depersonalization" of work, and adaptation problems for older workers. Thankfully, remedies did exist in better and more democratic education and in continued fights for the universal right to unionize.⁶⁸

Some militants cited in the report worried about the encroaching dangers of a depoliticized, technocratic society. Their language here resembled that of the social scientists I examined in chapter 1. "In a 'technological' society," one of them said, "politics tend to be devalued and relegated to the realm of technology. Technological evolution is necessary for economic expansion, but it should not be the sole determinant [of such expansion]." He affirmed the primacy of politics, "which includes

a conception of man and of social life.”⁶⁹ Technocracy might lead to the loss of democracy and the concentration of power in a few expert hands. The report’s authors commented in another section: “Citizens and workers are at a loss in front of the complexity of the problems faced by the State and by business; to a certain extent, leaders themselves are obliged to have confidence in their technologists. These all-powerful technocrats present serious dangers, and the question arises of how to balance their power.”⁷⁰ In order to confront such problems, the authors suggested, the union might need to enlist engineers and managers.

In the questionnaire that accompanied the report, union members were asked the following:

1. Based on your regional and professional experiences, can you try to explain the consequence of technological evolution on the mentality and on the very structure of the working class?
2. How can syndicalism adapt to this?⁷¹

The union local of one Paris bank answered: “We are seeing the replacement of ‘politics’ by the cult of technology.”⁷² Other responses expressed a similar frustration: “In the relationships between *technology* and *politics* it seems to us that ‘technologists’ complicate the parameters of problems at will, in such a manner as to make them unintelligible to the masses and thereby remove these from making political choices.”⁷³ Many respondents also supported the conclusion that technological development was changing class structure. Widening, skill-based differences in jobs and salaries created divisions within the working class, worried one respondent. Individualism might supplant working-class solidarity: “Though this situation abolishes Marxist theses about class struggle and the pauperization of the proletariat, it is also in danger of substituting . . . individual well-being at the expense of collective progress.”⁷⁴ This comment dug at both the CGT (which promoted the pauperization thesis) and Force Ouvrière (whose pragmatism seemed too materialistic to many CFTC/CFDT militants).

Still, not all members agreed with the report’s representations of technological change. Some answers—particularly those from sections with a large proportion of technicians and highly skilled workers—said the report presented “too negative an attitude” toward new technologies.⁷⁵ These respondents emphasized the need to recruit highly trained employees:

. . . syndicalism cannot be the enemy of technology. Progress marches on! Syndicalism must adapt and try to benefit as much as possible. Labor organization

must include all the personnel of a company: employees, technologists, skilled workers, managers, manual operatives. Together, they can develop solutions that will correct for technological dangers. . . . It is therefore up to us to train technologists as militants.⁷⁶

One group of telecommunications technicians went so far as to issue a warning: “We can already see a syndical fissure. Technologists do not like the old-fashioned methods of unions. The technologist is a man who is above all realistic. ‘Patter’ does not affect him much. . . . He wants actions, not promises. If working-class syndicalism does not adapt to modern methods, technologists will abandon it.”⁷⁷ Such threats were rare, though. Most responses which argued in favor of a more positive attitude toward technological change and a kinder view of technical experts also evoked the dangerous temptations facing technicians and others. The CEA’s Saclay local—unusual in that it included primarily technicians and scientists—did so with the most eloquence:

Technology is the motor of today’s civilization; it is a stranger to all moral ends. . . . The technologist is generally scrupulous and honest in his conclusions, but he often wears blinders. Yet irrational values should not inspire decisions after the technical examination of a problem is completed by infirming the conclusions of this examination. On the contrary, [they] should be present from the start, in as explicit a manner as possible, in order to give meaning to the effort of [developing] a technical solution. Then the so-called contradictions between the ‘ideal’ solution and the ‘technical’ solution would disappear by themselves.⁷⁸

Unions could thus help scientists and engineers build better, more responsible technologies. Saclay’s militants demanded that “irrational” social and political values shape development from the outset. This conception of politically malleable technology strongly resembled that of the engineers, and no wonder: some of the CFTC/CFDT militants from Saclay shared a professional background and culture with those engineers (including a few Polytechnique graduates), and most had probably worked with them on some aspect of gas-graphite research and development. As militants, they wanted to inspire their non-unionized colleagues to design technologies based on more “human,” non-capitalist values and to make them aware of the power and responsibility associated with their work. They also wanted to show their confederation that technological development was malleable and controllable, and to demonstrate the benefits to the working class of recruiting technical experts.

Meanwhile, the questionnaire responses make clear the tremendous range of views within the CFTC/CFDT. Whether or not they reflected on this subject independently, most union members agreed that techno-

logical change was pivotal to the future of French society and should therefore be of paramount concern to their confederation. Their responses depended in part on their level of involvement with creating technological change and in part on how they interpreted the report, how they positioned themselves within the union, and a host of other factors. Some saw technology as a dangerous and divisive force, others as a useful and controllable entity. The manner and extent to which militants thought technology could come under political control varied, as did their understanding of what political control might mean. But all agreed that technological development, both at the national level and at the workplace level, was a legitimate concern for labor union politics.

The three labor confederations thus concentrated primarily on general issues of national (or international) technology policy. They were mostly interested in large-scale systems: electric power, energy, railways, aviation, electronics. Their concern with these systems revolved around matters of sociopolitical power. Who would direct the design of these systems? How could unions shape their deployment? How should the social effects of technology be managed? In addressing these questions, each union offered a distinctive representation of the relationship between politics and technology. These representations reflected broader union platforms and became part of their efforts to establish a distinctive doctrine. In this fashion, union wove notions about technological change into their self-conceptions and into their ideas about how to shape the future of France.

The CFTC/CFDT report and the responses to the questionnaire raised one of the most important issues unions had to contend with, intermittently throughout the 1950s and the 1960s, and increasingly in the 1970s: how to recruit technicians, managers, and engineers to the labor movement. Taken up by all three unions, this issue went to the very heart of what it meant to be a labor union in an advanced technological society. It deserves a brief closer examination, not only for this reason but also because the rank-and-file engineers of the CEA and EDF were part of the elite which they sought to recruit.

Recruiting Technical Elites

As numerous scholars have observed, the figure of the *cadre*—the mid-level manager—became increasingly important in the decades after World War II.⁷⁹ In the words of one militant: “The *cadre* is he who defends both the interests of the factory and the interests of the work force. . . .

The *cadre* is thus boss, worker, and technician at once.”⁸⁰ For unions, the emergence of the *cadre*—an undeniably masculine archetype—signaled fundamental changes in the skill-based structure of the working class. At the same time, unions joined the national chorus proclaiming the need for even more technically trained personnel to ensure that France could participate fully in the modern world.⁸¹ How should they handle such changes? The three unions agreed on this issue more than most, even if pride and principle forbade them from acknowledging their commonalities. They focused their discussions on the need to make elite education more broadly accessible and to enlist experts in the cause of the labor movement.

All three confederations bemoaned the lack of French engineers, technicians, and scientists. *Force Ouvrière* writers estimated that France needed to produce between 10,000 and 17,000 new engineers every year in order to match the “Anglo-Saxon nations.”⁸² The CGT agreed, adding that everyone should have access to the appropriate training and demanding fellowships for students whose families could not afford to support them through extensive education.⁸³ All three unions called for better *promotion ouvrière* programs, which would give workers the opportunity to retrain for more technically sophisticated jobs within the same company.⁸⁴ *Force Ouvrière* militants even seemed willing to break their usual abstinence on attacking “the system” in order to critique the structure of French education: the problem, said one writer, was that “the prestige of the *Grandes Ecoles* exerts a real dictatorship which victimizes [individuals with] real intellectual abilities.”⁸⁵ Instead of emulating the examination system of the *grandes écoles*, other engineering schools should admit any student with an appropriate high school diploma. Furthermore, scientists and engineers did not receive sufficient compensation. According to one of the CFTC/CFDT’s science policy specialists, low salaries and unsatisfactory labor contracts discouraged young people from pursuing research careers.⁸⁶ These criticisms did not attack elite state technologists per se; rather, unions demanded more recognition for rank-and-file experts and better access to the institutions that produced them.

At the same time, unions debated how to approach the existing and growing population of technical experts. Clearly these men could not be left to the mercies of management, or of the CGC (Confédération Générale des Cadres, a union for mid-level management and staff). Engineers, technicians, and *cadres* had to be recruited to the cause of the working class.

This mission appeared to hold particular importance for the CGT,

which had sought—with very modest success—to attract *cadres* since early in the twentieth century. After the war it sponsored several *cadre* syndicates, loosely grouped into a Union Générale des Ingénieurs et Cadres. Not until the 1960s, however, did the UGIC gain the support required to have a strong voice within the CGT.⁸⁷

In rallying union-wide support, militants presented the UGIC as a necessary weapon in a class war over the loyalty of engineers and other *cadres*. In particular, it could help combat the influence of the CGC, which the CGT saw as a pawn with which upper-level management inculcated *cadres* with capitalist ideology. The UGIC could make engineers and technicians understand that they shared more interests with workers than with management:

The evolution of technology—leading to the employment of a steadily increasing number of technicians, *cadres*, and engineers under conditions that are often similar, from the perspective of work discipline and intensity, to those imposed on blue- and white-collar workers—makes the maneuvers of employers more and more difficult and helps [these employees] become conscious of the solidarity of their interests with those of workers as a whole.⁸⁸

A 1960 survey indicated that 14 percent of private-sector employees fell into the category of technicians, *cadres*, and engineers; this proportion reached 20 percent in the public sector.⁸⁹ The CGC duped *cadres* into thinking their interests lay with the ruling class. Only the CGT could demonstrate the importance of an alliance with the working class.

Belonging to the CGT would help engineers keep their priorities straight even when they rose to positions of power, thereby averting the ever looming danger of technocracy. Engineers, wrote one militant, had “a very healthy feeling of being creators, which can nevertheless stray towards technocracy if we don’t show them who really profits from the . . . technology that they develop.”⁹⁰ In particular, engineers needed to understand that blindly proposing methods to increase productivity did not serve anyone’s interest. An alliance between *cadres* and workers would strengthen the struggle against capitalism.⁹¹ Predictably, the most successful example of the benefits of such an alliance came from nationalized industry—especially EDF. One article in *La Vie Ouvrière* asserted: “Electricity and gas employees, whose right to strike . . . Pompidou contested recently, have for a very long time offered the example of a seamless solidarity between workers and *cadres*. From the manual operative to the engineer, they present a united front.”⁹²

Force Ouvrière militants made similar arguments in favor of recruiting

cadres. Force Ouvrière had had a large federation for *cadres* and white-collar employees since its creation.⁹³ The only way, it claimed, for “relations between labor and ‘technocracy’ to be more profitable [for labor] than those with ‘capitalism’” was to recruit the rank-and-file of “technocracy” to the cause of labor.⁹⁴ But recruiters had to keep in mind both the similarities and the differences between *cadres* and workers. On the one hand, an engineer, like a worker, would always be someone else’s subordinate. On the other hand, engineers underwent a longer apprenticeship, spent more time keeping up with technical developments, and generally had more people under their command than even the most highly trained foremen. Successfully integrating them into the union required taking all these factors into account.⁹⁵

The CFTC/CFDT did not form a separate organization for engineers and *cadres* until 1967, but engineers, scientists, and technicians had been an important part of its constituency throughout the postwar period. As we saw earlier, the subject made for lively discussion within the union. Indeed, despite the relatively strong presence of this constituency, CFTC/CFDT militants expressed more reservations about technical experts as a group than did their counterparts in other unions. For them, the danger of technocracy resided not only in the structure of the state but also in the mentality of engineers and *cadres*. “*Cadres*,” wrote one militant in 1967, “have a very developed sense of order. They put this order in place, and they benefit from it. Hence, they do not want to saw off the branch on which they are seated. Our problem as syndicalists is to react against this state of mind.”⁹⁶ Engineers often did not find strikes congenial modes of action, because strikes challenged order and efficiency. Militants therefore had to proceed gently. They needed to teach engineers how to actively incorporate the proper values in their work: “There are *cadres* who call themselves leftists yet who are rotten technocrats; for them, mathematics win out over human values.”⁹⁷ Such attitudes had also appeared in the questionnaire responses—for example: “The technologist is necessary, but [let’s] take the levers of command away from him, because the technologist is often blind. Leave the control to MAN.”⁹⁸ Though some technicians resented pejorative comments that represented them as inhuman and unmanly,⁹⁹ others readily agreed that technical specialists, while meaning well, often ignored the social consequences of their actions.¹⁰⁰ Joining the CFTC/CFDT would make engineers and technicians better men who would produce better technology.

For the three confederations, therefore, the changing sociotechnical world demanded transcending traditional class boundaries. They saw

technological knowledge as a locus of power, and they sought access to that power. For all three, this meant broadening their constituencies and their appeal, while at the same time blurring skill-based class distinctions.

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Labor unions offered distinctive visions of France's future technological identity. The CGT glorified French technology but argued that its true apotheosis could only come after a socialist revolution. Force Ouvrière lauded technological progress as a trans-national phenomenon that would situate a new France in a non-communist international community. The CFTC/CFDT expressed ambivalence about technological change, placing it at the center of French modernization and seeing its development as a complex process that required careful control.

Each scenario incorporated a distinct relationship between technology and politics, which in turn articulated how each union envisaged its role in shaping France's future. The CGT gave a fairly straightforward rendition of this relationship: The right political system yielded the right technological system. In order to truly shape France's future (technological and otherwise), militants should advocate revolution. The CFTC/CFDT took a more nuanced approach: Technological decisions were political because they were about power and social order. Values necessarily guided technological choices. Only by explicitly acknowledging this could unions and workers acquire a voice in shaping the nation's future. For both unions, tight links between technology and politics thus entailed ways to shape the nation. The obverse held true for Force Ouvrière: Only by separating technology and politics (conceived in the narrow sense) could the union pronounce on technological change.

Such distinctions aside, labor unions' scenarios for a French technological future rested on a different vision of the sociopolitical order than that imagined by state technologists—a more inclusive vision, one that gave workers a central role. In this sense, their scenarios worked as alternatives to those of state technologists. In another sense, however, the mere fact that unions imagined the scenarios they did strengthened the general proposition that France should have a *technological* future, a *technological* identity. In other words, the implicit agreement that France should define itself in technological terms was as significant as the disagreement over what those terms should be.

This significance transpires most clearly in the unions' discussions of how to recruit the technical elite, and in their basic agreement on this issue. Not even the CGT sought to wage class warfare with engineers;

instead, it, like the other unions, strove to include the technical elite in its struggles. Having embraced rapid technological development as part of France's future, militant leaders felt that the best way for their unions to participate in that future was by recruiting those in charge of designing that development. How to effect this recruitment posed a puzzle that unions could not fully resolve in the 1960s.

Their fundamental agreement on, and puzzlement about, the issue of technical elites may help to explain the relatively minor role played by the unions' ideological differences on nuclear sites during that decade. The daily operation of nuclear reactors did not require large numbers of manual workers. Most of the men who operated reactors were, on the contrary, skilled workers who underwent further training for their jobs. Those near the top of the workplace hierarchy received the designation of "technician." Most nuclear workers thus belonged to the elite of the working class; the engineers who supervised them, meanwhile, belonged to the technical elite which unions sought to recruit. Furthermore, the training and conditions of work in nuclear reactors raised new issues for workers, technicians, and their unions. Under such circumstances, the question of what problems unions should address (and how) apparently took precedence over articulating ideological differences. The youth of these early nuclear workers (most were in their twenties) probably contributed to the relative lack of union disagreement on reactors sites: even workers who had unionized before arriving at a site did not necessarily have the investment in rehearsing doctrinal differences that older militants might have had. Once unions had gained some experience with the nuclear workplace, their ideological differences resurfaced.

In first three chapters I discussed the development of two technopolitical regimes, one centered in the Commissariat à l’Energie Atomique and the other in Electricité de France. “Technopolitical regimes” are linked, inter-defined, mutually constitutive constellations of engineering practices, technological artifacts, political programs, and visions of the sociopolitical order. The artifacts of these regimes provide the basis, and sometimes even the mechanisms, for their political power. At the same time, political agendas both drive and are constituted during the process of designing technological systems. The narrative that CEA scientists, engineers, and administrators developed about their institution as the guardian of French scientific and military autonomy was not merely rhetoric; that narrative was cultivated and acted out in the reactors they designed, in the long-term development plans they advocated, and in their efforts to shape EDF’s reactors. The same was true for EDF technologists and their image of the nationalized utility as the nation’s foremost public service institution. Each institution’s cultural self-image was expressed, reshaped, and solidified by the material practices of its members. Similarly, the strength of each institution’s political program rested on its technological practices and artifacts. The notion of “technopolitical regime,” then, captures not only the fundamentally hybrid nature of the goals and activities of these institutions but also technologists’ efforts to use these hybrids as instruments of power, models for state politics, and expressions of French national identity.

To varying degrees, France’s three major labor unions all constructed scenarios in which workers could participate in this redefinition of French national identity centered on technological prowess. In theory, at least, workers could see themselves playing an active part in the construction of a new technological France. How did workers conjugate the scenarios offered by their unions with the technopolitical regimes in which they