

Introduction

In February 1975, images flickered across West German television screens of farmers and middle-aged villagers being assaulted with police water cannons and truncheons as they sought to block the construction of an atomic power plant in their village, Wyhl, located in what was then West Germany. Soon, the television station that had dared to transmit these images was decried by politicians and television executives as a communist stronghold.

Thirty-six years later, on 6 June 2011, German chancellor Angela Merkel—a physicist by profession—announced that Germany would abandon nuclear power by 2022. Dissent to this unprecedented decision was muted, coming mainly from the ranks of the leftist, environmentalist Greens, who felt Merkel's timetable unnecessarily delayed the shutdown of nuclear plants.

The slogan, *Atomkraft—Nein, Danke!* (Atomic Power—No Thanks!), once the rallying cry of a marginalized, radical movement, had come to be embraced by an entire society, it would seem. The Chernobyl and Fukushima reactor disasters of 1986 and 2011, respectively, had a far more muted long-term impact in most industrialized nations. In Germany, by contrast, opposition to nuclear power won the upper hand, and environmentalism became central to most Germans' sense of national identity. This was not always the case. In the wake of World War II and the Holocaust, East and West German leaders charted a course that involved a break with the Nazi past and an embrace of technological progress. Nuclear energy¹ was central to this vision. East and West Germans shared futuristic, utopian visions of the Atomic Age as an era of peace and progress for all humankind. With the help of science and technology, they hoped, East and West Germany could leave the Nazi past behind and become modern, forward-looking nations. Within a few years, however, thinking changed dramatically in the Federal

Republic of Germany (West Germany). The younger generation viewed the alliance between the political authorities, nuclear industry, and technical-scientific experts as rooted in the power structures and authoritarian thinking that had made National Socialism possible. West German activists strove to surmount Germany's pariah status by becoming part of the vanguard of transnational, progressive movements. Even in the GDR (the German Democratic Republic, or East Germany), the atomic consensus came to be questioned by a brave few.

Activists across West Germany rose up in what was nothing less than a popular rebellion against the rule of experts. The anti-nuclear power movement was rooted in a breakdown of popular trust in the state, elites, and the scientific establishment.² Faced with an almost monolithic nuclear power consensus, very diverse segments of West German society, ranging from Marxist radicals to conservative farmers, banded together to resist government policies. They vehemently rejected plans to turn idyllic regions of southwest and northern Germany into nuclear-powered industrial centers. Public intellectuals provided the foundations for a systemic critique of the West German nuclear power program and the elites that had produced it. In his 1977 book, *Der Atomstaat* (The Atomic State), Austrian journalist Robert Jungk put forth the thesis that reliance on nuclear weapons and nuclear power necessitated security measures that would lead to the reemergence of dictatorship. His biography as a Jew who escaped Austria in the wake of the *Anschluss* (the German takeover of Austria in 1938) lent him particular authority.³

Also very influential was sociologist Ulrich Beck's 1986 study, *Risk Society: Towards a New Modernity*. He argued that nuclear power represented a new kind of risk because the occurrence of catastrophic failure was so hard to predict and because its consequences were potentially so great. The government and scientific institutions could not protect the public, he insisted, and in fact resisted public scrutiny. Beck called for a democratization of the decision-making process regarding risky technologies and the application of ethical, philosophical, cultural, and political ways of reasoning to science and technology.⁴ Criticism of elites was much more circumscribed in the GDR, yet one East German scientist wrote, "Scientists, doctors, engineers, politicians and military men are, in spite of their expertise, not immune to error, deceit, corruption, carelessness, hunger for power, and vanity."⁵

Ultimately, though, it was not the intellectuals, but the citizenry that forced a fundamental rethinking of the relationship between citizens and the state. The anti-atomic power movement was an unqualified success. Steve Milder has shown in a recent study that anti-nuclear power activism

forged a powerful movement out of disparate groups and brought about a deepening of democracy in West Germany.⁶ Andrew Tompkins explores the synergy between the West German and French anti-nuclear power movements in another important work.⁷ Carol Hager establishes the importance of grassroots mobilization in German environmentalism.⁸ The present study places the movement in the larger context of the evolution of the nuclear power issue in Germany, East and West, asking why these activists ultimately triumphed. There is no doubt that the major nuclear power plant accidents in Three Mile Island in 1979, in Chernobyl in 1986, and in Fukushima in 2011 helped turn skepticism into outright opposition. However, Germany was and is a pioneer in attempts to completely phase out nuclear power.

Five factors help explain this German peculiarity: the association in Germans' minds of nuclear war and nuclear power; changes in the media landscape that helped to expand civil society in West Germany; the important role of scientific arguments and counterarguments in the debates concerning atomic energy; a learning process among West German activists that led to an evolution in thinking concerning violence; and the rise of the Green Party and the growing receptiveness of the major political parties to environmentalism. Of these five factors, the role of science in debates proved to be the most surprising, and in some ways the most compelling. In the words of historian Cathryn Carson, "Science is all over the history of the Federal Republic of Germany."⁹ However, this dimension of West German history has often been overlooked or underestimated.¹⁰

Can average citizens weigh in on scientific and technological policies in a meaningful way? This question has gained increasing importance with the tremendous upsurge in scientifically and technologically complex issues since World War II. The nuclear power debate in Germany represents a case in which citizens did, in fact, prove themselves able to grapple with such issues. This is not to say that their interventions were in every case well founded, yet the breadth and depth of popular attempts to understand the ins and outs of nuclear power are impressive. Eventually, public opinion was able to sway Chancellor Angela Merkel, a former physicist.

Recent spectacular examples of popular rejection of science—such as global warming denial and the antivaccination movement—seem to suggest that the public is too irrational, misinformed, or poorly educated to weigh in on scientific issues. However, scholarly research presents a far more complex understanding of the popularization of science than these examples seem to suggest and has pointed to the importance of lay knowledge in the scientific process.¹¹ Furthermore, the emotional, ideological, and religious commitments of average citizens are not necessarily incompatible with science. Historians have shown that scientific inspiration and competence

can be found in what has long been thought to be unlikely places—in medieval Christianity, the Islamic world, astrology, and orthodox Marxist thought.¹²

Marxist and Christian anti-nuclear power activists in West Germany discovered that arguments about nuclear power based on their respective belief systems left them open to criticism. Historian Michael Schüring rightly views Protestant activists' use of a biblical frame of reference as unscientific in nature. However, as he points out, they went on to embrace scientific arguments, drawing on the expertise of pastors with a scientific background, as well as scientific and technical experts who became involved in Church activism.¹³ Leftist activists also made serious attempts to understand the technical and scientific fundamentals of nuclear power, as publications from the 1970s and 1980s reveal. This turn to science was crucial to the movement's quest for legitimacy in the eyes of the public, government officials, the courts, and the international community.

While accepting science as a cognitive system, activists were highly critical of scientific institutions, science as a profession, and what they saw as an alliance between science, the state, and the nuclear industry. Activists in West Germany asserted that the supposedly "scientific" consensus behind the atomic power program was in fact highly ideological, politicized, and corrupted by ties to industry. In Communist East Germany, a small group of dissident scientists and their friends agreed in private that "science is a good deal more subjective, corrupt, subservient, and intentionally false than the average citizen might imagine. And in scientific fields related to ecology and nuclear technologies, there is far more science for sale than science that is honest and accurate."¹⁴

This critical stance emerges out of much older debates and discussions concerning the interpenetration of science, politics, society, the economy, and culture. In the nineteenth and early twentieth centuries, proponents of technocracy claimed that only experts were capable of scientific reasoning or participating in decision making connected with the running of modern societies.¹⁵ The technocracy movement of the 1930s even sought to replace democracy with rule by engineers and scientists.¹⁶ A soft technocratic approach emerged after World War II across the industrialized capitalist world, as many political leaders sought to rationalize and legitimize policymaking through a mutually beneficial alliance with experts. US president Dwight D. Eisenhower warned both of the influence of politics and big money on science and "the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite."¹⁷ Public intellectuals ranging from C.P. Snow to Jürgen Habermas were concerned that such collaboration could undermine democracy.

Scholars disagreed over whether this was likely in the technocracy debate of the 1960s and 1970s. West German antinuclear activists were influenced by these exchanges. According to sociologist Peter Weingart, the nuclear power controversy made the West German public aware for the first time that experts could disagree among themselves concerning major scientific and technological issues and that the political leadership specifically recruited and promoted those experts who supported their political agenda. Weingart asserts that the authority of science was eroded, not only by the “scientification of politics” and the “politicization of science” but also by the “mediatization of science,” meaning scientists’ efforts to reach and influence the public through the media. In his view, these developments reduced science to the status of one actor among many.¹⁸

My research confirms that anti-nuclear power activists contested the authority of scientists who entered the fray as experts supporting government nuclear power policies, and in fact they entered into very public and very loud debates with them. However, one of the most important findings of my study is that the anti-nuclear movement was not at all averse to science as a cognitive system and in fact made extensive use of scientific arguments and promoted the popularization of scientific and technical knowledge about nuclear power. They struggled to educate themselves and others, studying the workings of the atom, the health consequences of exposure to radioactivity, technical vulnerabilities of conventional atomic reactors, problems with newer technologies, and the inability of authorities and industry to find safe and acceptable ways of disposing with nuclear waste. They learned a great deal from *Gegenexperten* (counterexperts), the term used in Germany for experts critical of the scientific establishment and its coalition with the state.

What effect did environmentalism have on Germans’ approach to public policy and nuclear power in particular? German romanticism and back-to-nature movements of the late nineteenth and early twentieth centuries would seem to suggest that Germans were greater lovers of nature than other peoples. However, David Blackbourn’s work on waterways shows that in fact Germans’ relationship with the environment was characterized by tremendous tensions between attempts to preserve nature on the one hand and to subjugate nature in the pursuit of progress on the other.¹⁹ The state played a major role in both endeavors. Even the Nazis promoted certain environmentalist policies.²⁰ During the “Economic Miracle” after World War II, neither policymakers nor the public viewed environmentalist policies such as antipollution measures as undermining the pursuit of prosperity, but rather as a part of the rising standard of living.²¹ What changed after 1970 was that environmentalists no longer saw the state and the elites as defenders of the environment. Only then did environmentalism become a protest movement.

New attitudes toward emotions helped legitimize the West German public's participation in debates on nuclear power and other ecological issues. Here, the history of emotions is helpful, providing ways of understanding emotions as a constituent part of human existence and history, rather than merely a disruptive factor in political life and decision making in modern societies.²² In 1975, supporters of nuclear power asserted that they were representatives of rationality, while tarring opponents of nuclear power as emotional and therefore not competent to weigh in on this issue. Referring to emotional anti-nuclear power demonstrators, television journalist Hans-Gerd Wiegand replied, "It is completely legitimate to show emotions."²³

Historian Frank Biess argues that the outward-directed emotional regime of the late 1940s and 1950s was supplanted in the 1960s by a greater acceptance of interior emotional life.²⁴ The rise of environmentalism and the anti-atomic power movement provide good examples of how emotions forced elites to confront scientific and technological problems in new ways and to allow the public to participate in debates and negotiations. In the 1970s and 1980s, many West Germans felt they were living in a world filled with threats. The New Cold War of the 1980s only partially explains the sense of dread so pervasive among the younger generations in that period. Environmentalism grew in tandem with fears of toxic contamination, resource depletion, and forest die-offs. New attitudes toward emotions valorized fears and made it possible to articulate them in public and to turn them into political demands. At the same time, the West German public debate on atomic power in this period gives lie to the notion that science and emotion are intrinsically incompatible.²⁵

The West German nuclear power controversy was fueled by the clash of two starkly differing visions of West Germany's future. The major political parties, the state bureaucracies, and the business community advocated joining the capitalist-democratic West through economic modernization, full employment, prosperity, and technological achievement. These priorities became all the more important in their eyes during the energy crises and recession of the 1970s. In addition, West German provinces, called *Länder* (states), provided considerable subsidies and participated in the running of nuclear power plants owned by public utility companies. Thus, the West German political leadership was deeply committed to atomic energy on both ideological and material levels, making retreat almost unthinkable.

Scientists and engineers were among the first advocates of nuclear power, and there were few dissenting voices among them in either Germany. They had long subscribed to an apolitical ethos that made them loyal servants of a state conceived as above politics. This orientation grew out of the

struggles of the nineteenth and early twentieth centuries to professionalize, to bolster their status, and in many cases simply to secure employment in their professions.²⁶ German scientists and engineers displayed little inclination to criticize the state, and they embraced the professional opportunities as well as the ideological benefits of a strategy of economic and technological modernization. Werner Heisenberg, who had played a major role in the Nazi atomic bomb project, became a major spokesman for science as a foundation of modern identity, as Cathryn Carson has shown.²⁷ West Germans, casting around for a usable past and new foundations for a sense of national identity, were very receptive to Heisenberg's message in the 1950s and 1960s.

Activists of various stripes challenged these values. In the 1960s, young people across the globe led the charge against authority, conformity, and the belief that technological and economic progress should be society's main goal. Intellectuals such as Herbert Marcuse and Antonio Negri spread Marxist thought and inspired a generation of radical students to take up the revolutionary cause. The latter were highly critical of what they saw as Western imperialism in the Third World, and they organized the movement against the Vietnam War. Young West Germans confronted their country's Nazi past. They sought to break down authoritarian structures still in existence in Germany.²⁸ The state reacted with harsh countermeasures, supported by a large swath of the electorate.

Political and cultural polarization tore at the social fabric. In the long run, however, "1968" contributed to the democratization of West German society. In the short run, West German society was roiled by conflicts regarding the meaning of democracy and citizenship. Conservative professors accused students of behaving like the Hitler Youth. Students responded that the real Nazis were professors who did not want to allow protests. Activists profoundly challenged political authority and law enforcement, disputing the idea that democracy was merely a matter of voting in elections and obeying elected officials.

The anti-atomic power movement emerged as one of the most important "new social movements" of the 1970s. New social movements are generally considered to be popular movements that focus, not on issues revolving around class or socioeconomic status but on quality of life, sometimes described as "postmaterialist values." Competing schools have variously viewed new social movements as irrational reactions to social breakdown; rational attempts to attain concrete goals or political objectives; creators of countercultural milieus that defy social norms and authority, such as Marxist or anarchist groups; or subcultural movements, which have a strong in-group orientation, as in the case of the women's movement and the "alternative" scene. In fact, the anti-nuclear power movement encompassed

all these different strands, but sociologists have been reluctant to accept an all-inclusive explanation for the success of new social movements.²⁹ As Steve Milder has pointed out, new social movement theory fails to recognize the unifying force of the anti-atomic power movement, as well as its profound contribution to the democratization of West Germany.³⁰

Diversity gave the movement broad appeal. Not all participants in the anti-nuclear power movement had ties to sixties radicalism. The rural population in particular tended to be wary of outsiders, particularly those leftists whom they perceived as ideologically rigid.³¹ Nonetheless, these more conservative elements participated in a mobilization of society from below that challenged the institutions, ethos, and practices of the West Germany system. Local activist and vintner Annemarie Sacherer protested before television cameras against the police handling of demonstrations in Wyhl in 1975, shouting, “This is no longer a democracy!”³² A viewer who saw a television program about this demonstration wrote in to the TV station, arguing, “The pictures show more clearly than any commentary could, how people trying to exercise their constitutional rights were denounced and treated like heretics and criminals.”³³

The archival records from that period make clear that many who went to demonstrations were not part of any organization. They were motivated by local concerns or felt that as good citizens they should speak up—out of concern for the environment or out of anger against what they saw as an out-of-touch government and elite. To shoehorn all who participated in the movement or who were swayed by it into one category or the other is to miss the great diversity of this mobilization and the deep and broad impact it had on the general population. Gradually, it won over people who simply read a leaflet or watched a television program about opposition to nuclear power. Over time, opinions shifted, creating a fundamental distrust of atomic power that became activated by the Three Mile Island, Chernobyl, and Fukushima disasters.

More enlightening than new social movement theory in trying to explain the successes of the West German anti-nuclear power movement are a body of sociological writings on four dynamics that help make social movements effective: cultural power, organization, negotiation, and disruption. First, movements need to be able to sway public opinion through the dissemination of convincing new ideas. Second, organizational infrastructure is key to mobilizing supporters, providing leadership, and securing resources. The third factor, negotiation, involves politics, engagement with the state, legal action, and bargaining within and outside the activist community.³⁴ The “strongest weapon of social movements” is the power to physically disrupt through demonstrations, blockades, and occupations.³⁵ Generally,

these involve protesters placing their bodies in harm's way for the purpose of physically impeding the maintenance of the status quo.³⁶ The West German anti-nuclear power movement was strong in all four areas. But did it have an actual impact on society and the political system?

Activists struggled to win over public support. Initially, nuclear power polarized society. The first major wave of antinuclear activism, in 1975–1977, coincided with a wave of terrorism, spearheaded by the Red Army Faction (RAF, popularly known in the English-speaking world as the “Baader-Meinhof Gang”). Caught up in this fight, state governments countered anti-atomic power protests by building up and deploying massive police and security forces. A significant portion of the West German population thought of opponents of nuclear power as dangerous radicals. This negative image was reinforced by the clashes between demonstrators and police near the planned nuclear power plant construction site in Brokdorf, a small town in the north of West Germany, in 1976–1977.

The anti-nuclear power movement was divided over the advisability of violent confrontations with police during demonstrations. During the campaign to prevent the construction of a nuclear power plant in Brokdorf, demonstrators attempting to enter the construction site engaged in pitched battles with police, while other activists peacefully demonstrated elsewhere. However, as Andrew Tompkins has argued, such distinctions were often not so clear-cut. Some forms of passive resistance and civil disobedience involved physical contact. And many demonstrators who would never have gone on the offensive felt they, along with other protesters, had the right to defend themselves against police.³⁷ Nonetheless, a turn toward more peaceful methods took place between the mid-1970s and the mid-1980s, accompanied by the rise of the environmentalist Green Party and the increased participation of feminists in the movement. Activists became more tolerant of violence in the wake of Chernobyl but soon turned to blockades and other forms of passive resistance in the fight to stop the delivery of radioactive waste to Gorleben from the 1980s to the early twenty-first century.

The rise of the West German nuclear power movement would not have been possible without the tremendous expansion and transformation of civil society and mass media that took place from the 1960s to the 1980s. The Green Party began as an “anti-party,” avoiding the norms of conventional politics and resisting commitment to parliamentary democracy. By the 1990s, it evolved into a conventional party, increasing its electoral support and joining coalition governments, most notably the “red-green” coalition with the Social Democratic Party, which governed Germany from 1998 to 2005.

Profound shifts in the West German media world enabled the anti-nuclear power movement to bring its case before the court of public opinion. In the decades after World War II, the media's ability to mobilize popular opinion against the government was severely constrained. The Federal Republic's first chancellor, Christian Democrat Konrad Adenauer (in office 1949–1963) saw state domination of the media as a means to democratize West Germany, but also to tamp down opposition. He gave access to friendly journalists, fed the media official versions of events, bullied editors and heads of broadcasting networks, and even considered censorship laws. State governments exercised considerable control over public television and radio networks, which monopolized the airwaves until the introduction of commercial television stations in 1981. During the 1950s, politicians largely succeeded in silencing critical radio commentary.³⁸

Fundamental changes and explosive growth in the 1960s transformed the media landscape, opening it up to points of view not sanctioned by the federal or state governments. Journalists participated in the seismic cultural and political shifts of that period. They sought to promote democratization, help overcome authoritarian cultural patterns, and decisively break with the Nazi past, as historian Christina von Hodenberg has shown. An ideal of “engaged journalism” emerged that proposed that journalists could take sides politically, engage in investigative journalism and social critique, and defend the downtrodden but that it was not their job to help create and preserve some sort of cultural or political consensus.

The defenders of this model took on the hierarchies and centers of authority in the media. Journalists working for *Stern*, a very popular weekly magazine, were assured that they did not have to write anything that violated their convictions. On the other hand, Rudolf Augstein, editor in chief of *Der Spiegel*, a major news magazine, fired “engaged journalists.”³⁹ As the example of the Nazi rise to power illustrates, expanded media presence in the political realm does not always bring about liberalization and democratization.⁴⁰ In this particular case, however, it did. Television journalists were no longer content to allow government and industry spokesmen to drown out other viewpoints. Over state objections, they gave common citizens the opportunity to speak on TV about why they opposed the building of nuclear power plants. These journalists were trying to expand both media presence and the realm of free speech.

Less idealistic forces were at work as well, as historian Bernd Weisbrod has argued. The tremendous growth of journalism as a profession in the 1960s created fierce competition among journalists. The rise of television added to the competitive atmosphere, as magazines struggled to maintain their readership. The struggle for market shares and professional advancement spurred

an expansion of investigative reporting.⁴¹ The *Spiegel* scandal of 1962 made the media into political participants. Defense Minister Franz Josef Strauß accused the news magazine *Der Spiegel* of having published state secrets in compiling investigative reports on the West German military and caused journalists to be arrested. Strauß lost his job as a result. This run-in with the government gave journalists a deeper sense of autonomy and valorized their work as never before. At the same time, the public began to expect the media to take on a more confrontational role vis-à-vis the state.

In the GDR, the SED (the Socialist Unity Party, as the ruling Communist Party was called) put the full force of its power and influence behind the defense of nuclear power. Criticism of atomic energy was long kept in check through state censorship. Suppression of non-Communist organizations precluded the emergence of a mass nuclear power movement. The SED did, however, treat society as an important actor in the quest for “technical–scientific progress.” A central aspect of citizenship was mobilization—in factories, schools, and universities—for the technology-driven advancement of socialist society.⁴² Moreover, key aspects of professionalism were left intact. Even in an era in which the Soviet Union was supposedly in charge of ensuring the safety of nuclear power plants, East German engineers were at work on obscure but important projects to improve nuclear safety.

In the 1980s, as East Germany’s economic and technological problems mounted, so too did political dissent. Emerging peace, human rights, and ecology activism began to create tentative and vulnerable beginnings of a civil society. This enabled a few activists to disseminate criticism of uranium mining and nuclear power.

Although East German media operated under dictatorial conditions, they were not the lifeless tool of the SED. Certainly, the SED did everything in its power to prevent the emergence of a public realm separate from the state and the SED. The SED viewed the unity of state and society as central to the success of socialism and did not like to be contradicted or undermined. However, the GDR was much more than just the SED. Earlier German traditions, institutions, and ways of thinking lived on until at least the late 1960s. By that time, Western youth culture began intruding on what was called “really existing socialism,” meaning the imperfect form of socialism then actually in existence. Something like a public sphere was beginning to emerge by the late 1980s, mostly under the stewardship of the Protestant Church. However, I avoid the term “public opinion” because some might object that it implies the existence of a public realm independent of the state. The term “*popular* opinion” is more open-ended in this regard and is more appropriate for nondemocratic societies.⁴³

The SED tried to mold popular opinion, but nonapproved views sometimes made their way into popular culture.⁴⁴ As cultural theorist John Fiske has pointed out, the producers of popular culture must respond to viewer preferences or lose their audience.⁴⁵ Popular tastes helped mold East German television programming,⁴⁶ as well as the content of illustrated magazines and other down-market publications. Visual culture was not monitored as closely by censors as texts. Under some circumstances, popular opinion came bursting through the usual reserve and conformity, for example after the Chernobyl nuclear power plant explosion in 1986, when citizens inundated the authorities with their concerns.

Additional factors make a comparison between East and West Germany fruitful, starting with their common history and language. During the Cold War, the two countries saw each other as rivals in many realms, including technology, scientific research, culture, and social development. Emulating and reviling each other, both pursued social, economic, and technological modernization. *Détente* very much promoted East–West contacts.⁴⁷

At the same time, the GDR's ties to the Soviet Union and the Federal Republic's to the United States made them part of different, although not entirely separate, transnational networks. After World War II, the United States tried to induce West German politicians and citizens to follow the American lead in developing nuclear power but not nuclear weapons.⁴⁸ Criticism of nuclear power safety came out of the US science community. Disquieting research on radiation and human health was conducted in many countries, but US scientists were the most likely to take the issue to the popular press. West German and US antinuclear activists learned from each other. The occupation of the nuclear power plant construction site in Wyhl, West Germany set an example for the Clamshell Alliance, an activist organization that was fighting the building of an atomic plant in Seabrook, Massachusetts.

The East German leadership relied on the Soviet Union for most of its nuclear energy hardware, but also for expert advice and safety monitoring. Soviet reluctance to fulfill this role, as well as accidents in GDR nuclear power plants, caused the GDR to seek greater technological self-reliance by the 1970s. East German nuclear authorities increasingly adopted Western standards and imitated Western technologies. The GDR also embraced the Soviet glorification of nuclear power as a powerful motor of socialist progress. This dream of socialist technological superiority faded by the 1980s. Mikhail Gorbachev's reformism encouraged expression of discontent over the country's nuclear power regime. The harsh suppression of such dissent—modeled on older Soviet practices—prevented East Germans from mounting a serious challenge to technocratic patterns of decision making.

My first chapter looks at the popular culture of nuclear power from the end of World War II until the early 1970s, focusing on the rallying of public support for nuclear power. The Soviet Union tried to match the American Atoms for Peace program with its own claims to be the biggest proponent of “peaceful uses of the atom” and staunchest opponent of atomic war. Consensus regarding the desirability of nuclear power existed among political, economic, and scientific elites in both Germanys. However, despite bursts of euphoria concerning the cornucopia that nuclear energy ostensibly offered, there were some signs of popular unease regarding radiation and atomic power, particularly in the wake of the Bikini nuclear bomb test of 1954. Nuclear power could not shake its association with “the bomb” in the popular mind. This chapter asks whether West German culture was atypical in this regard, comparing analyses of popular depictions of nuclear power in illustrated magazines across cultures. Television programs relating to nuclear energy and accounts of an “Atoms for Peace” exhibition also provide interesting insights into the place of nuclear power in the popular imagination.

Chapters 2 and 3 turn to science and technology. Chapter 2 compares approaches to safety, risk, human error, and nuclear power accidents in East and West Germany from the 1960s to the 1980s. The engineering community, in tandem with industrial leaders and state regulators, developed “engineering philosophies” that guided fundamental approaches to safety. Initially, there were striking East–West differences. As a result of conflicts within and between institutions involved in nuclear power production and oversight, the GDR eventually adapted itself to Western standards, particularly in the wake of the Chernobyl disaster. This chapter also asks how much the public knew about safety problems. Security concerns kept accidents in the GDR secret, while West German nuclear power plant owners attempted to avoid bad publicity by covering up safety problems. However, the West German public demanded and received better information as time went on.

Chapter 3 looks at the origins and diffusion of the scientific and technological arguments that became central to opposition to atomic power in West Germany and, later, the GDR. US scientists made key contributions to research on the health consequences of radiation exposure as well as to criticism of nuclear reactor safety. Maverick scientists and other “counter-experts” in West Germany took up these arguments against nuclear energy, just as the anti–nuclear power movement was moving onto a national and international stage, giving it a crucial boost. This turn toward science was embraced by West German popularizers, who disseminated and modified these arguments.

The spectacular emergence of the West German anti–atomic power movement is the topic of Chapter 4. The government of Baden-Württemberg,

headed by Christian Democrat Hans Filbinger, made the planned nuclear power plant in Wyhl a cornerstone of a technocratic policy of development of Baden, a rural region of West Germany, as well as a step toward overcoming the 1970s oil crisis. Protests ensued, culminating in the occupation of the nuclear power plant construction site in 1975. What began as a regional protest of wine growers and villagers concerned about the impact of the proposed plant on the local economy and on the microclimate grew into a national movement. This movement questioned the equating of nuclear power and progress; the close alliance of the state and nuclear industry; the objectivity of technical and scientific “experts” friendly to the government; and the top-down model of decision making that had prevailed up until that time in West Germany.

Television and the press helped shift power relations between opponents of nuclear power and the state. The Filbinger government engaged in a heated media campaign against the Wyhl protesters and against WDR, a major public broadcasting network. The immediate result was a deeply divided, polarized public realm. Scientific findings played a significant role in these debates. The debates problematized the role of emotion, which was variously interpreted as an impediment to rational, scientific discourse or, conversely, as a gateway to greater public participation.

Conflicts over nuclear power grew into what was nearly a civil war in Brokdorf, the topic of Chapter 5. The government of Gerhard Stoltenberg wanted to construct a nuclear power plant there that would serve both Schleswig-Holstein and Hamburg, in the north of the Federal Republic. Many of the same phenomena observable in the Wyhl case were also present in the Brokdorf conflict: determination on the part of the government to defend this project both as an important component of a modernization program and as a profit-making public utility; government attempts to intimidate the media (in this case, the NDR—Norddeutscher Rundfunk, or Northern German Broadcasting, a public broadcasting network) and discredit the protesters as dangerous radicals; involvement of political activists, some quite radical, in the protests; and polarization of the public. Each side tried to deploy science to defend its case.

While the Wyhl plant was never built, Stoltenberg carried out his plans for Brokdorf with iron determination. More police were deployed than ever before in the history of the Federal Republic. The activists engaged in an intense debate regarding politically motivated violence, leading to a slow but steady decline in violence among anti-nuclear power protesters, lasting until 1986.

The 1986 Chernobyl disaster unleashed a wave of violence among anti-atomic power protesters, the subject of Chapter 6. However, state

mishandling of the upsurge of unrest discredited state actions. In Hamburg, hundreds of anti-Brokdorf demonstrators were held for eighteen hours, tightly packed and largely without access to food, water, or bathrooms. This incident was treated as a national scandal. Many people who had never before participated in a demonstration joined in protests after Chernobyl. Ulrich Beck's *Risk Society* spoke to the national mood. The Greens served to consolidate opposition to atomic power, although infighting slowed the rise of the more conciliatory and pacifistic wing of the party.

I return to the GDR in Chapter 7, which traces the rise of anti-nuclear power activism there. It originated with scientists, unlike in the Federal Republic. Sebastian Pflugbeil (a physicist and biomedical researcher at the Academy of Sciences) was one of perhaps five scientists who became interested in nuclear power, its risks, and its possible impact on human health. They quietly conducted their studies for years, reading and analyzing scientific publications. Through these scientists, atomic power became one of the topics of interest to the ecological movement that enjoyed the Protestant Church's protection.

In the 1980s, particularly after the Chernobyl disaster, they began to write samizdat publications (photocopied "publications" not sanctioned for general circulation by the state) and give talks within the framework of the Protestant Church. Chernobyl unleashed an unprecedented wave of appeals to the state for information, assistance, and advice. In Church circles, Chernobyl became the touchstone of a wave of environmentalist activism. This chapter examines the outlooks, politics, and habits of GDR activists. State oppression of the fledgling movement fostered a sense of solidarity among its members. Some of these activists later became involved in the New Forum, which negotiated the transition to a multi-party system.

The book's final chapter discusses debates about atomic power since reunification and asks why Angela Merkel's government decided in 2011 to phase it out. Two quite contradictory tendencies contributed to this "energy turn." The first is professionalization of the Green Party and of environmentalist research as well as the emergence of a vibrant alternative energy sector and its incorporation into the capitalist economy. The second is the continued militancy of the anti-atomic power movement, which was focused on the disposal of nuclear waste in Gorleben. The Fukushima disaster sounded the death knell of atomic energy in Germany. Or did it? In light of climate change, the parameters of the debate concerning nuclear power have shifted considerably, and the future remains uncertain. I agree with historian Frank Uekötter's view that the rise of environmentalism has been historically contingent and is reversible.⁴⁹

Notes

1. In German, the term *Atomkraft* (atomic power) came to be used by its opponents, while *Kernkraft* (nuclear power) or *Kernenergie* (nuclear energy) were used by its proponents. This distinction dwindled by the mid-1980s. Matthias Jung, *Öffentlichkeit und Sprachwandel: Zur Geschichte des Diskurses um die Atomenergie* (Wiesbaden: Springer Fachmedien, 1994), 43–46, 60–62, 82–89, 134–36, 194–95. The difference between atomic power, atomic energy, nuclear power, and nuclear energy is not as pronounced in English. To avoid tedium, I use them interchangeably throughout this study.
2. Albrecht Weisker, “Expertenvertrauen gegen Zukunftsangst: Zur Risikowahrnehmung der Kernenergie,” in *Vertrauen: Historische Annäherungen*, ed. Ute Frevert (Göttingen: Vandenhoeck & Ruprecht, 2003), 394–421.
3. Robert Jungk, *Der Atom-Staat: Vom Fortschritt in die Unmenschlichkeit* (Munich: Kindler, 1977). English translation: Robert Jungk, *The New Tyranny: How Nuclear Power Enslaves Us*, trans. Christopher Trump (New York: F. Jordan Books/Grosset & Dunlap, 1979).
4. Ulrich Beck, *Risikogesellschaft: Auf dem Weg in eine andere Moderne* (Frankfurt am Main: Suhrkamp Verlag, 1986), 37 (on the last point). First English edition: Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London and Newbury Park, CA: Sage, 1992). The democratization theme comes out more clearly in Ulrich Beck, *Gegengifte: Die organisierte Unverantwortlichkeit* (Frankfurt am Main: Suhrkamp Verlag, 1988), 277, 288.
5. Sebastian Pflugbeil, preface to Michael Beleites, “Pechblende: Der Uranbergbau in der DDR und seine Folgen,” Samizdat publication, unnumbered pages, BStU, HA XVIII, Nr. 18237, 84.
6. Stephen Milder, *Greening Democracy: The Anti-Nuclear Movement and Political Environmentalism in West Germany and Beyond, 1968–1983* (Cambridge, UK and New York: Cambridge University Press, 2017).
7. Andrew Tompkins, *Better Active Than Radioactive! Anti-Nuclear Protest in 1970s France and West Germany* (Oxford: Oxford University Press, 2016).
8. Carol Hager, *Technological Democracy: Bureaucracy and Citizenry in the German Energy Debate* (Ann Arbor, MI: University of Michigan Press, 1995).
9. Cathryn Carson, *Heisenberg in the Atomic Age: Science and the Public Sphere* (Cambridge, UK and New York: Cambridge University Press, 2010), 3.
10. The main problem is the divide between historians of technology and science on the one hand and those who study society, culture, and politics on the other.
11. Brian Wynne argues that while lay knowledge is socially constructed, so too is science in “May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide,” in *Risk, Environment and Modernity: Towards a New Ecology*, ed. Scott Lash, Bronislaw Szerszynski, and Brian Wynne (London: Sage, 1996), 44–83. By contrast, Steven Shapin takes a realist stance, positing in *Never Pure: Historical Studies of Science* (Baltimore, MD: Johns Hopkins Press, 2010) that science is an imperfect, human enterprise, influenced by social and historical context, yet universalistic and fundamental to the technological foundations of the modern world. Roger Cooter

- and Stephen Pumfrey also emphasize this relationship between the scientific community and the public in the making of science in “Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture,” *History of Science* 32, no. 3 (1994): 237–67.
12. Edward Grant, *The Foundations of Modern Science in the Middle Ages: Their Religious, Institutional and Intellectual Contexts* (Cambridge, UK and New York: Cambridge University Press, 1996); George Saliba, *A History of Arabic Astronomy: Planetary Theories during the Golden Age of Islam* (New York: New York University Press, 1994); Lawrence Principe, “Alchemy Restored,” *Isis* 102, no. 2 (2011): 305–12; Loren Graham, *Science in Russia and the Soviet Union* (Cambridge, UK and New York: Cambridge University Press, 1993), 112–16.
 13. Michael Schüring, *‘Bekennen gegen den Atomstaat’: Die evangelischen Kirchen in der Bundesrepublik Deutschland und die Konflikte um die Atomenergie 1970–1990* (Göttingen: Wallstein Verlag, 2015), esp. 181–97.
 14. Email from Sebastian Pflugbeil to Dolores Augustine, 31 March 2015.
 15. These include the utopian socialist Henri de Saint-Simon, sociologist and economist Thorstein Veblen, and engineer Frederick W. Taylor, the founder of “scientific management,” or Taylorism.
 16. Edwin Layton, *The Revolt of the Engineers: Social Responsibility and the American Engineering Profession* (Cleveland, OH and London: Press of Case Western Reserve University, 1971).
 17. Dwight D. Eisenhower, “Farewell Radio and Television Address to the American People, January 17th, 1961,” Eisenhower Archives, retrieved 20 October 2017 from https://www.eisenhower.archives.gov/all_about_ike/speeches/farewell_address.pdf. See also Jeff Hughes, *The Manhattan Project: Big Science and the Atom Bomb* (Cambridge, UK: Icon Books, 2002), 128–29.
 18. Peter Weingart, *Die Stunde der Wahrheit? Zum Verhältnis der Wissenschaft zu Politik, Wirtschaft und Medien in der Wissensgesellschaft* (Weilerswist, Germany: Velbrück, 2001), 133–39, 143; Peter Weingart, “Verwissenschaftlichung der Gesellschaft—Politisierung der Wissenschaft,” *Zeitschrift für Soziologie* 12 no. 3 (1983): 225–41.
 19. David Blackburn, *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany* (New York: Norton, 2006).
 20. Joachim Radkau and Frank Uekötter, eds., *Naturschutz und Nationalsozialismus* (Frankfurt and New York: Campus Verlag, 2003).
 21. Frank Uekötter, *Deutschland in Grün: Eine zwiespältige Erfolgsgeschichte* (Göttingen: Vandenhoeck & Ruprecht, 2015), chs. 2–4.
 22. For a useful approach to emotions on the radical left, see Joachim Häberlen and Jake Smith, “Struggling for Feelings: The Politics of Emotions in the Radical New Left in West Germany, c.1968–84,” *Contemporary European History* 23, no. 4 (2014): 615–37. On “fear” and the quest for “security” in the German debates over nuclear disarmament, see Holger Nehring and Benjamin Ziemann, “Führen alle Wege nach Moskau? Der NATO-Doppelbeschluss und die Friedensbewegung—eine Kritik,” *Vierteljahrshefte für Zeitgeschichte* 59, no. 1 (2011): 81–100. For an overview of the history of emotions, see Jan Plamper, *The History of Emotions: An Introduction*, trans. Keith Tribe (New York: Oxford University Press, 2015).

23. WDR Historisches Archiv, Signatur 12523, transcript of “Glashaus—TV Intern,” dated 1 April 1975. My translations throughout.
24. Frank Biess, “Feelings in the Aftermath: Toward a History of Postwar Emotions,” in *Histories of the Aftermath: The Legacies of the Second World War in Europe*, ed. Frank Biess and Robert Moeller (New York: Berghahn Books, 2010), 30–48. Also Frank Biess, *German Angst? Fear and Democracy in Postwar West Germany* (New York: Oxford University Press, forthcoming).
25. For example Spencer Weart, *Nuclear Fear: A History of Images* (Cambridge, MA: Harvard University Press, 1989). He sees popular fears regarding nuclear power as emotional and therefore a rejection of science.
26. Dolores Augustine, *Red Prometheus: Engineering and Dictatorship in East Germany, 1945–1990* (Cambridge, MA: MIT Press, 2007), 22–27.
27. Carson, Heisenberg, chs. 5 and 6.
28. Timothy Brown, *West Germany and the Global Sixties: The Anti-Authoritarian Revolt, 1962–1978* (Cambridge, UK and New York: Cambridge University Press, 2013), esp. 4–12, 81–84.
29. Ruud Koopmans, *Democracy from Below: New Social Movements and the Political System in West Germany* (Boulder, CO: Westview Press, 1995), 7–37 and 229–36, and literature cited therein. On the “alternative scene,” see Sven Reichardt, *Authentizität und Gemeinschaft: Linksalternatives Leben in den siebziger und frühen achtziger Jahren* (Berlin: Suhrkamp Verlag, 2014).
30. Milder, *Greening Democracy*.
31. Tompkins, *Better Active*, 25, 41–50.
32. WDR Historisches Archiv, Archive number 0165239. Ulrich Eith, “Nai hämmer gsait! Stilbildender ziviler Widerstand in Wyhl am Kaiserstuhl,” in *Aufbruch, Protest und Provokation: Die bewegten 70er- und 80er-Jahre in Baden-Württemberg*, ed. Reinhold Weber (Darmstadt: Theiss Verlag, 2013), 52; article on 35–54.
33. WDR Historisches Archiv, 7210, letter dated 26 February 1975.
34. Kenneth Andrews, *Freedom Is a Constant Struggle: The Mississippi Civil Rights Movement and Its Legacy* (Chicago, IL: University of Chicago Press, 2004), 2–6, 198–200.
35. Sidney Tarrow, *Power in Movement: Social Movements and Contentious Politics*, 3rd rev. ed. (Cambridge, UK and New York: Cambridge University Press, 2011), 103–4; see 25, 124–29, 231.
36. Tiya Miles, “Fighting Racism Is Not Just a War of Words,” *New York Times* (21 October 2017). The roots of physical resistance are many, ranging from Mahatma Gandhi’s conception of passive resistance to long-standing practices of rebellion and revolution.
37. Tompkins, *Better Active*, ch. 5; Michael Sturm, “Polizei und Friedensbewegung,” in *“Entrüstet Euch!” Nuklearkrise, NATO-Doppelbeschluss und Friedensbewegung*, ed. Christoph Becker-Schaum, Philipp Gassert, Martin Klimke, Wilfried Mausbach, and Marianne Zepp (Paderborn: Ferdinand Schöningh, 2012), 277–93.
38. Matthias Weiss, “Öffentlichkeit als Therapie: Die Medien- und Informationspolitik der Regierung Adenauer zwischen Propaganda und kritischer Aufklärung,” in *Medialisierung und Demokratie im 20. Jahrhundert*, ed. Frank Bösch und Norbert Frei (Göttingen: Wallstein Verlag, 2006), 73–120; Christina von Hodenberg,

- Konsens und Krise: Eine Geschichte der westdeutschen Medienöffentlichkeit, 1945–1973* (Göttingen: Wallstein Verlag, 2006), 152–215.
39. Von Hodenberg, *Konsens und Krise*, 245–439, esp. 420–33.
 40. Frank Bösch and Norbert Frei, “Die Ambivalenz der Medialisierung: Eine Einführung,” in *Medialisierung und Demokratie im 20. Jahrhundert*, ed. Frank Bösch and Norbert Frei (Göttingen: Wallstein Verlag, 2006), 7–23.
 41. Bernd Weisbrod, ed., *Die Politik der Öffentlichkeit—die Öffentlichkeit der Politik: Politische Medialisierung in der Geschichte der Bundesrepublik* (Göttingen: Wallstein Verlag, 2003), esp. the introduction and articles by Frank Bösch and Willibald Steinmetz.
 42. Andrew Port, *Conflict and Stability in the German Democratic Republic* (Cambridge, UK and New York: Cambridge University Press, 2007); Jörg Roesler, “Die Produktionsbrigaden in der Industrie der DDR. Zentrum der Arbeitswelt?” in *Sozialgeschichte der DDR*, ed. Hartmut Kaelble, Jürgen Kocka, and Hartmut Zwahr (Stuttgart: Klett-Cotta Verlag, 1994), 144–70. On state citizenship, see Jan Palmowski, “Citizenship, Identity and Community in the German Democratic Republic,” in *Citizenship and National Identity in Twentieth-Century Germany*, ed. Geoff Eley and Jan Palmowski (Stanford, CA: Stanford University Press, 2008), 73–93. He interprets the GDR conception of citizenship as encompassing economic, social, and cultural participation in the socialist community, although he does not focus on the workplace.
 43. Usage in Ian Kershaw, *Popular Opinion and Political Dissent in the Third Reich, Bavaria 1933–1945* (Oxford: Oxford University Press, 1983), 4.
 44. An example is the glorification of (East) German technology and the downplaying of Soviet technological achievements in a book handed out to eighth graders who completed their *Jugendweihe*. See Alfred Kosing, Diedrich Wattenberg, and Rolf Dörge, *Weltall Erde Mensch: Ein Sammelwerk zur Entwicklungsgeschichte von Natur und Gesellschaft*, 13th ed. (Berlin: Verlag Neues Leben, 1965), unnumbered pages 336–37, 352–53, 393, 400–401, 404, and 415–49. See also my analysis in Augustine, *Red Prometheus*, 223–24.
 45. John Fiske, “The Popular Economy,” in *Cultural Theory and Popular Culture: A Reader*, ed. John Storey, 3rd ed. (Harlow, UK: Pearson Education Ltd., 2006), 537–53. Also see comments and application of Fiske in Thomas Lindenberger, “Einleitung,” in *Massenmedien im Kalten Krieg: Akteure, Bilder, Resonanzen* (Cologne: Böhlau Verlag, 2006), 16–17 and introduction on 9–23.
 46. Heather Gumbert, *Envisioning Socialism: Television and the Cold War in the German Democratic Republic* (Ann Arbor, MI: University of Michigan Press, 2014), 13. For a broad and deep analysis of popular entertainment programs, see Rüdiger Steinmetz and Reinhold Viehoff, eds., *Deutsches Fernsehen Ost: Eine Programmgeschichte des DDR-Fernsehens* (Berlin: Verlag für Berlin-Brandenburg, 2008). For East–West German comparative studies on television, see Lindenberger, *Massenmedien im Kalten Krieg*, esp. Uta Schwarz, “Der blockübergreifende Charme dokumentarischer Filme,” 203–34 and Thomas Heimann, “Television in Zeiten des Kalten Krieges: Zum Programmaustausch des DDR-Fernsehens in den sechziger Jahren,” 235–61. Schwarz finds parallels in developments in East and West Germany.

47. Frank Bösch, “Geteilt und verbunden: Perspektiven auf die deutsche Geschichte seit den 1970er Jahren,” in *Geteilte Geschichte: Ost- und Westdeutschland 1970–2000* (Göttingen: Vandenhoeck & Ruprecht, 2015), 7–38.
48. On American attempts to mold science policies in postwar Europe, see John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge, MA: MIT Press, 2006).
49. Uekötter, *Deutschland in Grün*, 137.