Education and Utopia: Technology Museums in Cold War Germany

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Abstract

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In the aftermath of a violent war waged in the name of fascist utopian visions, German museum educators nonetheless explained the political benefits of technology. They did so in view of the new demands for democracy, but as divided Cold War adversaries as well. Educators in four museums uniquely tailored their national and geopolitical lessons to the publics of Munich, Schwerin, Dresden, and West Berlin. However, the democratic technological societies depicted by the museums all contained similar tensions that did not overcome the problems of fascist politics. By wedding democracy, technology, and education unambiguously together, the aims and exhibitions of technology museums ultimately epitomized the persistent allure of utopia in politics well beyond 1945.

To begin with, portraying a straightforward connection between technology and democracy was problematic. When museum exhibitions illustrated the tremendous promise of science and technology for creating the “good life,” they focused on the powerful and vast extension of human tool-making capacity. However, modern technological systems were also profoundly destabilizing and de-centering for individual subjects, because they created the possibility of 1984-like political repression, environmental degradation, class division, and, most frighteningly, human annihilation. Also, issues in education posed difficulties for a democracy, since the authority of
educators themselves was particularly contested in the aftermath of Nazism and the protests of 1968.

Yet technology museums minimized social tensions and maintained the advantages of technology for peaceful, equal relations among liberated peoples, thus deferring the resolution of contradictions to the utopias they depicted. In the end, education in Cold War German technology museums continued to resonate with the utopian impulses of National Socialist politics. However, ideology was not the only thing that made the museums utopian, since technology and education themselves had powerful implications for the relationship among individuals, society, and the world.
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Abbreviations

AL The Alternative List Party
CDU Christian Democratic Union Party
CSU Christian Social Party (Bavaria)
COMECON Council for Mutual Economic Assistance
ESER Unified System of Electronic Computing Technologies
ESS Economic System of Socialism
FDJ Freie Deutsche Jugend (Free German Youth Brigade)
FDP Free Democratic Party of Germany
FRG Federal Republic of Germany (West Germany)
GDR German Democratic Republic (East Germany)
ICOM International Council of Museums
LPG Agricultural collective (Landwirtschaftliche Produktionsgenossenschaft)
MAD Mutual Assured Destruction
MiK Ministry for Culture (Ministerium für Kultur)
MiV Ministry for People’s Education (Ministerium für Volksbildung)
MVT Museum für Verkehr und Technik, West-Berlin (Museum of Transportation and Technology)
NATO North Atlantic Treaty Organization
NDSD National Socialist Worker’s Party of Germany
NES New Economic System
PTMS Polytechnisches Museum Schwerin
RGW (= COMECON in German)
SALT Strategic Arms Limitation Talks
SDI Strategic Defense Initiative (“Star Wars”)
SED Socialist Unity Party (Sozialistische Einheitspartei)
SPD Socialist Party of Germany
TMD Technisches Museum Dresden (Technical Museum of Dresden)
UN United Nations
UNESCO United Nations Educational, Scientific, and Cultural Organization
VEB Volkseigener Betrieb (Nationally-owned enterprise)
WTK Scientific-technical revolution (Wissenschaftlich-technische Revolution)
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Introduction

In 1945 Germany, the goal of democracy was not an easy prospect. When Germans began to rebuild, they not only had to deal with physical reconstruction but moral rehabilitation. In a war that claimed some 50 million lives across the globe, the German public in particular seemed to have been either too submissive or willing subjects of a murderous regime. The Holocaust epitomized inhumane German fascism, and also represented the great extent to which German citizens were apparently incapable of or disinclined towards the democratic values that they were supposed to embrace after defeat in 1945. On top of this, the notion of democracy itself had dubious connotations following Adolf Hitler, whose success came from broad public support.

The other major problem for democratic reconstruction in Germany was that technology, as a result of World War II, had itself acquired connotations of diabolical ingenuity and violence. Besides a growing array of weaponry with which to stock the average arsenal, the conflict brought forth the innovation of systemized mass murder and the feat of the atomic bomb. Though the atomic bomb was ultimately "American," Germany offered an equally, if not more, disturbing and lethal case. The once gleaming

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Introduction

standards of “German science” or “German engineering” were also mingled with scientific racism and technological genocide. 4 The deployment of the bomb, and the misery of the millions who suffered in war that produced it, not only insured that the age to come would be characterized by advanced technology, but was also a reminder of the ambivalence of technology.

The hope following the war was that education, correctly formulated and implemented, would prevent future abuses of the political system by instilling antifascist values into citizens. However, education was by no means uncomplicated. For one thing, the efforts under Hitler to bring all of society “into line” (Gleichschaltung) had included educational instruction, or a complete “pedagogization” of all aspects of life in order to eliminate the room for individual thought. 5 The recognition that education had been part and parcel of the fascist “devastation of sociability,” thus presented a worrisome problem; fascism’s success created “doubt in the liberal model of society, a model which, following the Enlightenment tradition, assumes the existence of citizens who are actively competent, intervene into social situations, and understand socio-political problems as their own.” 6 If, as philosopher Theodor Adorno maintained, “the demand that Auschwitz should never reappear” was the very first one for education, how was this then to occur?

At the same time, technology increasingly informed education after 1945, and indeed all institutions of the public sphere, in a way that provided its own challenges.

4 As Dower’s work argues, racial depictions were crucial to the escalation of violence in the Pacific theater on both sides of the conflict, and factored into the deployment of the atomic bomb upon the “yellow” Japanese.
6 Ibid.
Advances in media and information technology facilitated the burgeoning complexity of public exchange, and multiplied the number of participants and the arenas in which information exchange occurred as well. Developments in technology also continued to alter the very experience of communication and social operations. Thus, the technological transformation in education was not merely a matter of an increasing array of instructional instruments. Rather, the sprawling, and even systemic, nature of advanced technology affected large social institutions like education deeply. And by touching upon education, the ambiguities of technology reached into the very thing that was supposed to ensure democratic reform.

Investigations into the educational dilemma were more than academic especially given the extreme stakes of the Cold War, a world conflict that Germans in particular experienced dramatically within their borders. Quartered and occupied among the allied forces of the US, Great Britain, France, and the USSR, Germany served as the setting for wary wartime allegiances that quickly disassembled under the weight of opposing geopolitical goals, miscommunication, and mistrust. Open hostility between the USSR and the North Atlantic powers was embodied by the formation of the Federal Republic of Germany (West Germany, FRG) and the German Democratic Republic (East Germany, GDR) in 1949, a separation made concrete with the building of the Berlin Wall on 13 August 1961. In this atmosphere, antifascism may have been the order of the day, but the parameters of democratic education were by no means clear. The “four Ds” of antifascism – demilitarization, denazification, decartelization, democratization – formed a road map bereft of any markers. However, the battle between “East” and “West” soon

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provided militant guidelines for antifascist politics, as socialist and capitalist systems struggled to lay sole claim to the title of true democracy.

Thus, in postwar Germany, the ambivalence and power of technology presented workers for democracy with a complex problem. In the aftermath of a technologically violent war waged in the name of fascist utopian visions, the education of a critically thinking public was necessary for democracy. Everyone involved in reconstruction had to believe that an antifascist German public was capable of acquiring the ability for autonomous action in the face of immoral state policies. Yet reconstruction would simultaneously require technological ingenuity, and therefore complicated technological issues, which could potentially undermine the very efforts for moral and political reformation. Furthermore, the volatile conflict of Cold War would continually inform the standards of democratic reconstruction.

Few other institutions exemplified the depth of the Cold War contest more than museums of technology in Germany. On first blush, technological museums might seem unlikely candidates for passionate politics since benign images of school trips, family outings, or exhibits on “The Electron and You!” are more likely to come to mind than the tension of geopolitics. Moreover, visitors to technology museums do not typically intend to engage politics, but to learn technological lessons or to be entertained; traversing a room of highly polished and gracefully restored antique automobiles, for example, could hardly be less polemical.

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Yet technological exhibitions are deeply political, and not merely when the subject, like genetic cloning, is particularly charged. Technology museums are political because they offer interpretations of how the world works, or how humans are to relate in light of the scarcity of resources and the mutual obligations of society, and thereby trade in the most fundamental questions of society and life. Thus, when it came to the explicit reworking of fundamental issues in Germany, technology museums after 1945 were particularly vivid examples of the politics of technological education. Following the violence that divided Germany into Cold War adversaries, German museum educators made a case for the political benefits of technology in accordance to the new demands for democracy. In four museums, technological educators on both sides of the Wall argued that technological development was a harbinger of democracy while they laid unique claim to the designation “democratic.” Correspondingly, they tailored their national and geopolitical lessons to the publics of Munich, Schwerin, Dresden, and West Berlin.

Despite the geopolitical opposition, however, museums across the Cold War divide depicted technological societies in ways that similarly did not overcome past political problems. When technology museums in East and West Germany represented a harmonious or, more to the point, democratic society, their formulations were never limited to the prospects of advanced technologies alone. On either side of the conflict, they dealt ultimately with the promise of individual and social transformation that lay at the core of education. Thus, education and utopia are the focus of this study on postwar German politics, technology, and society. In spite of their ideological differences, the utopian depictions of society in East and West technology museums all tried to resolve
tensions inherent to the themes of democracy, technology, and education in ways that resonated with the fascist past they thought they had left behind.

Intellectual inheritances of technological museum education in Germany

Postwar German technology museums perfectly exemplified the issues of democracy, technology, and education because they manifested significant historical developments in all three fields. The public education about technology, and the politics associated with it, first assumed the form of a pedagogically-oriented technology museum in Munich in 1903. Precursors to the technology museum had existed long before in the technological curiosities of early modern Wunderkammern (chambers of wonder), the emergence of handicraft museums, and the grand industrial exhibitions in England and Paris.\textsuperscript{9} Impressive collections on display also existed at the Conservatoire des Arts et Métiers in Paris and the South Kensington Museum in Great Britain.\textsuperscript{10} However, with the founding of the Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik (the German Museum of the Masterpieces of Natural Science and Technology) in Munich at the turn of the twentieth century, technological exhibits departed from a focus upon the mere collection and display of interesting technologies. Thereafter, the development of technology alone became worthy of depiction and discussion.

Comprehensive in scope and educational in purpose, the Deutsches Museum also


\textsuperscript{10} Walter Hochreiter, \textit{Vom Musentempel zum Lernort: zur Sozialgeschichte deutscher Museen, 1800-1914} (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994); Klemm, \textit{Geschichte der naturwissenschaftlichen und technischen Museen}; Rainer Kupfer, "Technische Museen - Probleme ihrer historischen Entwicklung," \textit{Schriftenreihe des Instituts für Museumwesen} 23, no. 3 in the \textit{Studien zur Geschichte des Museumswesens und der Museologie} series (1986). The Conservatoire opened in 1792; the South Kensington Museum, which absorbed many of the technological exhibits from London's World Exhibition of 1851, was first and foremost a \textit{Kunst/Gewerbemuseum} that opened in 1852.
included national interpretations of technology’s significance while extolling the virtues of the engineering class as well.  

Yet the political aspect of technology museums was intrinsic to the museum institution itself, whose formation accompanied the emergence of a public sphere.  The modern shift in sovereignty from privileged nobles to the masses created new obligations to the public and resulted in the creation and expansion of political institutions. One case in point was the public museum, the founding of which followed the French Revolution. Using the Louvre for public exhibitions of art (that incorporated confiscations of the French Army from conquered European countries and territories), “Emperor of the French” Napoleon Bonaparte adeptly demonstrated the national and political dimensions of a public institution. Opening the Louvre not only unlocked the treasures of princes to commoners, it also created a space in which the public – in the democratic spirit of liberté, égalité, fraternité – could enjoy the rewards of Napoleon’s victories and actively support his rule. From the nineteenth century onwards, museums

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11 See Chapter 1.
would become a significant part of European national public spheres, especially in Germany.

Another revolution that was responsible for technology museums also had great significance for national politics. The onset of the Industrial Revolution further contributed to the transition of power from highborn elites to the educated and rising middle classes. With the shift away from agriculture towards industry, landed elites began to lose their fiscal and political dominance. In addition, the expansion of railways into a national network during the mid-nineteenth century forged literal connections between the independent principalities while it created the industrial and economic bases of the future nation. Moreover, the technology of rail launched a transformation in people's very consciousness that shrunk perceptions of time and space and eroded regional isolation.\(^{14}\) However, if the industrialization of Germany was an antecedent of its economic and territorial unity, it also brought the attendant social problems of the Industrial Revolution evidenced elsewhere, such as poor labor conditions, class conflict, and migrant populations. Thus, technology was both a factor in the legal unification of Germany and implicated in the nation's social disharmony.

Conflict over the significance of technology for political and social life therefore had particular importance for German lands in the late nineteenth and early twentieth centuries, and bore powerful intellectual fruit. Riding the rails, people felt – palpably and psychically – free.\(^{15}\) At the same time, however, the daily experiences of industrial


laborers were the complete opposite. In works such as The Communist Manifesto, Karl Marx and Friedrich Engels presented an argument that promised to resolve the tension. The intertwined processes of industrialization and capitalization – fueled by the spread of ever-innovative technology – would eventually result in the rule of society by factory workers, not owners. Even those who disagreed violently with this logic saw, nevertheless, the potential for social liberation through technology. As one contributor to a Munich newspaper proclaimed at the beginning of the twentieth century, “[o]nly technology gives the cultural world the means ... to reduce the time and the intensity of mechanical drudgery. Every technical victory is a piece of the social question solved.”16

The social issues of industrial society were critical for another kind of politics at work in technology museums: the late-nineteenth- and early-twentieth-century debates regarding education, human autonomy, and social organization that were also of special interest to German-speaking circles. First and foremost among these issues was the nineteenth-century ideal of education, or Bildung, formulated by the philosopher and Prussian Minister of Education Wilhelm von Humboldt, among others.17 Focused on cultivation and self-development, Bildung was a process that prized philosophy, but valued a romantic “wholeness” and unique individuality over ideas of rationality. Thus “an individual having undergone training in this Universitas litterarum would possess the

16 W.L. Fritzsche, "Die Lebenswerte der Technik," unidentified newsclip, probably from Münchener Neueste Nachrichten, as quoted in Hecht, "Technology, Representation and the German Nation, 1900-1929," 85.
17 Friedrich Wilhelm Christian Karl Ferdinand Freiherr von Humboldt (1767 - 1835) was also a renowned linguist and the founder of Humboldt University in Berlin. His brother, (Friedrich Heinrich) Alexander, Baron von Humboldt (1769-1859) was a significant natural scientist.
moral and aesthetic sensibility and wide ranging learning required for enlightened autonomy."^{18}

However, in the latter half of the nineteenth century, industrialization and the broadening of educational opportunities produced a class of newly educated citizens whose arrival did not sit well with the cultivated proponents of Bildung. Beleaguered professors, secondary teachers, and pastors sought to defend Bildung not merely to protect their social position, but also to advocate certain cultural values. They were hostile to the democratization and industrialization that accompanied the extension of education, such as technical or vocational sciences, since advocates of Bildung despised the turn towards instrumental and utilitarian ends. In fact, by extolling the achievements of engineers, the Deutsches Museum itself was a part of this battle between the rising fortunes of the technologically adept and the "old guard" of the philosophical elite, who enjoyed a hegemonic position in society.^{19}

In addition to the issue of ultimate educational goals were new matters of method and psychology, both of which the Deutsches Museum fleshed out as well. The institution in Munich was the first museum to model installations around the active engagement of visitors with push-button dioramas and other mechanical devices.^{20} Thus

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^{19} Hochreiter, Vom Musentempel zum Lernort.

^{20} Waidacher, Handbuch der allgemeinen Museologie. Though a number of articles and books have attributed the first push-button exhibit to the Deutsches Museum, Susan Hecht maintains otherwise, Susan K. Hecht, "Technology, Representation and the German Nation, 1900-1929" (Dissertation, University of California at Irvine, 2000). She notes that the South Kensington Museum in fact had one instance and that earlier technological exhibitions also had "engaging” offerings. Otto Lührs has also written on the Urania, a scientific "theater" founded in Berlin in 1889, which allowed visitors to engage with push-button physics experiments from its opening (Thomas Edison gave a demonstration of his phonograph that year as well),
from its beginnings, the Deutsches Museum, and indeed technological museums as a whole, addressed the issue of learning as a process through principles of pedagogy and educational psychology. Developments in psychology certainly affected the broader understanding of human behavior, and specific pedagogical notions of learning processes as well. The late-nineteenth- and twentieth-century struggles between Pavlovian theories, which argued that mental connections were created through repetition, and Gestalt psychologists, who looked to the overall importance of cognitive structure, fundamentally affected technology museum education. At issue were both the process and the goals of learning, or the ways to encourage – even force – visitors to learn. Which had priority, for example: personal growth or social utility? If a student’s autonomy was the ultimate aspiration, at what point should the authority of the educator give way to the prerogatives of the individual? Educators formulated the problems neither clearly nor consistently, for many questions existed. However, creating standards for education meant that museum educators traded in ideals of human individual and social life.

These queries touched upon an older quest of human organization: utopia. Utopias are the reservoirs of imaginative thinking concerning the hope that humans can live together happily. They can be set in the future, the past, and sometimes outside of time altogether. Geographically, utopias have populated islands in the far seas, other


planets, and occasionally, one's own backyard. Yet at the heart of utopia is desire, specifically "the desire for a better way of being." For philosopher Ruth Levitas, utopia expresses and explores what is desired; ... it involves the imagining of a state of being in which the problems which actually confront us are removed or resolved, often, but not necessarily, through the imagining of a state of the world in which the scarcity gap is closed or the "collective problem" solved.

In utopias, the values concerning human community that are dearest to their creators gain color and life in depictions of another time or another world.

Education has often been a fundamental aspect of utopias. The capacity to think of an alternative world where people live in harmony, and the belief that it remains within human power to create, comes from an acquaintance with past thoughts, other ideas, and experiments. Education was important in Thomas More's *Utopia*, the work that started the Western exchange on utopian thinking. As a learned text, *Utopia* was itself an example of education's potential, since More wrote it "in large part to help [readers] find the necessary intellectual space to think of alternative schemas for living at a time ... characterized by widespread poverty, gross inequalities of income, lawlessness and general chaos, and in desperate need of reform." Education plays moreover a special role within utopian scenarios because of its equalizing force; it levels the advantages or disadvantages of wealth and property and provides the training for persons to become functioning parts of society. Appropriate training is crucial, since utopia is a state that needs learning, or a place that needs achieving – else we would already be there. With its emphasis on growth and transformation, education is utopian.

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23 Ibid., 191.
On this side of the Cold War contest, it seems unequivocal that utopias are not only literary or theoretical, but also political. The historian François Furet argued as much in his essay “Europe after Utopianism,” which referred to the grand contest between liberal democracy and communism of the late twentieth century. The impetus to translate vision into politics appears to come from the nature of utopia itself. As Levitas explains, sometimes utopias remain in the realm of mere fantasy, but other times, the visions are compelling enough for people to want to make them reality. There is then a transformative, mobilizing quality to utopias that corresponds to the power of desire. However, there also exists a practical problem when individual visions couple or collide against others in formulations of policy. Conflict is exacerbated especially when extraordinary technological power and its social implications, or the standards of democracy, come into play.

Public institutions are places for mediating these tensions between individual and social visions, and technology museums quite easily become a space for this kind of negotiation, since they have very strong utopian associations. To begin with, as constructed places out of step with everyday time, museums themselves have affinities with the “no-places” of utopias. Constructions of imagination are the foundation of the museum form. Moreover, utopian harmony, technological objects, and museal forums have been wedded ever since Francis Bacon described the wondrous scientific chambers of his New Atlantis. If utopias are also about a better way of being, so too were German technology museums, confluences of the French and Industrial Revolutions that could not help but deal with the subject of democracy and technology.

The challenging terms of the Cold War contest

Like education, the areas of democracy and technology in Germany each had their own utopian impulses that were integral to reconstruction. Indeed, they set the stage for the Cold War contest, which was not only a battle for military superiority but also a struggle for political legitimacy. For Germany in particular, this latter challenge was the more important one, but the victory over fascism was represented as a triumph of democratic forces and their superior technology.

Democracy, however, was an “essentially contested concept,” to use the terms of political philosophers W.B. Gallie and William E. Connolly, within the national borders of West Germany and the United States alone, not to speak of across the capitalist-communist divide. According to Connolly, democracy is contested because definition invariably leads to the invocation of norms. An agreed set of democratic ideals, for example, can still translate into contests over prioritization between the “power of citizens to choose their government through competitive elections” and the “quality of opportunity for all citizens in attaining positions of political leadership,” if not the “continuous participation of citizens at various levels of political life.” The very concepts used to express democracy are also complicated and contested, such as power, political, equality, or participation.

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27 Connolly, The Terms of Political Discourse, 10-11.

28 Ibid.
If the nature of democracy is indeed essentially contested, then challenges over liberalism and socialism were part and parcel of politics itself. For Rosa Luxemburg, a German socialist of the early twentieth century assassinated for her politics, there could be "no democracy without socialism, no socialism without democracy." She prophetically proclaimed that the tension between socialism and democracy was "the formula of an interaction that will decide the future."\textsuperscript{29} In contrast, a dichotomized understanding of socialism and democracy has primarily been a consequence of the Cold War, during which politicians and ideologues cast a world battle between the communist or socialist and the liberal capitalist. Especially in the United States and West Germany, democratic policies focused on the individual agent and tied the economics of capitalism to democracy. The socialist rejection of private property and belief that all should share in the fruits of labor then became the antithesis of a "democratic," free market.\textsuperscript{30} On the opposite side of the curtain, converse attitudes prevailed. Nevertheless, as historian Furet has argued, "the communist idea ... has always been inseparable from modern democracy." In other words, capitalist liberalism and communism-socialism in fact needed each other during the Cold War to help construct and define their own ideas and policies.\textsuperscript{31}

Theoretical debates over the nature of democracy after 1945 took on a different character in praxis under the shadow of weaponry that ended the war. Although the atomic bomb had been "unthinkable" in 1939 and 1940, Hiroshima and Nagasaki in

\textsuperscript{29} As quoted in Bloch, quoted in Ruth Levitas, \textit{The Concept of Utopia} (Syracuse University Press, 1990), 97.


August 1945 were testaments to the amazingly accelerated developments of technological warfare during World War II. These developments characterized the tenor and intensity of the Cold War standoff. Despite every effort to keep the design a secret from the Soviets, the mere fact of detonation gave many scientists what they needed to know: that an atomic bomb was possible. The USSR was victorious with their attempts to detonate the bomb in 1949 – aided by German scientists from the Soviet Zone of Eastern Germany – with Great Britain following in 1952.\textsuperscript{32} Thereafter, the hunt for greater and farther-reaching destructive power continued and made the dispute over democratic values an issue of life and death.

In the Germanies, hostility remained high between East and West despite rapprochement at the beginning of the 1970s. With the arrival of Social Democrat (SPD) Willy Brandt as chancellor, along with his left-leaning government, West Germany initiated a reduction of tensions with the East. The provisional treaty he signed with Moscow in 1970 recognized the postwar borders and the loss of former territory in Eastern Prussia. Brandt also reached an accord on Berlin the next year that assured FRG representation for the Western half of the city.\textsuperscript{33} These treaties, for which Brandt won the Nobel Peace Prize, were ratified in 1972, and the West German public affirmed both Brandt and his policy of Ostpolitik in his reelection that year.\textsuperscript{34} However, the treaties did not mean that peace between the superpowers was secured, as the stationing of medium-range missiles first on Soviet and then on West European soil in 1977 made clear.


\textsuperscript{34} Turner, \textit{From Partition to Reunification}. 
However, doubts about technology went beyond the threat of Mutual Assured Destruction (MAD) and had also been present since 1945. For more than just Germans, the prospect of nuclear war was a “trauma” of the 1950s generation; cultural historian Andreas Huyssen likened the repetitive nuclear war drills to a tragic-comic kind of Fluxus, or art performance. What also became clear as people gradually cleared the rubble and rebuilt social infrastructures, however, was that technologies developed during and after the war were revolutionizing daily existence. As Erich Hahn, an ideologue of the GDR, pithily stated, “in short, the complexity of economic, technical, organizational, ideological, cultural, and other social problems – grows.” The average German dealt with the prospect of atomic war while at the same time witnessing the proliferation of airplanes, automobiles, and televisions. Accompanying the tremendous quantitative and qualitative technological growth was a host of unintended problems that caused increasing worry and anxiety, especially from the 1970s. Pollution, for example, became a concern for many as the by-products of rapid reconstruction projects became literally visible. Other issues like the elimination of jobs, desire for “instant gratification,” and “information overload” also appeared. People who worried about these transformations asked with renewed urgency whether it was necessary to protect humanity from

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35 Boyer notes a 1948 survey of college-educated participants who thought atomic energy would in the long run “do more harm than good,” Boyer, By the Bomb’s Early Light: American Thought and Culture at the Dawn of the Atomic Age (New York: Pantheon, 1985), 121. Despite the “utopian” attitudes towards technology in the 1950s and 1960s in West Germany, critical reflection had begun as well, Wolfhard Weber and Lutz Engelskirchen, Streit um die Technikgeschichte in Deutschland 1945-1975 (Münster, New York, Munich, Berlin: Waxmann, 2000), 244-45.

36 Andreas Huyssen, Twilight Memories: Marking Time In a Culture of Amnesia (New York: Routledge, 1995), 284.

technology rather than assuming its beneficence. Thus, whether atoms could actually be used for peace or some other humane value remained an open question.\textsuperscript{38}

If the Bildung debates around industrialization and educational values showed German thinkers to be uneasy with technology's effect upon political organization in the nineteenth century, this tradition was only deepened in the twentieth. The devastating technology of the Great War had a significant impact upon industrial figures like Walther Rathenau and intellectual notables like Ernst Jünger. Their concerns about the "social question," and the larger attempts to reconcile the breach between technology and society through technocratic state systems, exemplified the intense reflection about technology's impact upon society in the wake of World War I.\textsuperscript{39} Later in the interwar period, views about technology and society became radicalized. The "reactionary modernism" of conservatives and Nazis was a contradictory but powerful combination of reactionary political ideas and modern technology that promised to replace the "chaotic postwar reality" with order.\textsuperscript{40} After 1945, however, the failure of the National Socialist dream played an intricate part in the ruminations of philosopher Martin Heidegger. Famous for his "Question Concerning Technology," Heidegger addressed the problem of technology's incursion into every aspect of human life.\textsuperscript{41} Across the rapidly technologizing world, but especially in Germany, intellectuals such as Herbert Marcuse,

\textsuperscript{38} Dwight D. Eisenhower (1890-1969), US general during World War II and the nation's 34\textsuperscript{th} president, launched the famous "Atoms for Peace" initiative with a speech to the United Nations in 1953. He skirted, however, questions posed to him on the issue of nuclear weapon stockpiling. Pringle, \textit{The Nuclear Barons}, 123.


\textsuperscript{40} Jeffrey Herf, \textit{Reactionary Modernism} (New York: Cambridge University Press, 1986).

Jürgen Habermas, Niklas Luhmann, and Ulrich Beck also reflected upon the remaining possibilities for human agency, liberty, and non-technical values.\textsuperscript{42}

Broad public discomfort also centered largely on the issue of technological control.\textsuperscript{43} Crises from the late 1960s gave few reasons for confidence in the ability of “those in charge” to guide technological growth. The student revolts on both sides of the Atlantic in 1968 showed the caesura in generational relations on both sides of the Iron Curtain. Between the professed aims of political leaders and their actual policies – whether the “high-tech” but disastrous Vietnam War, unfulfilled promises of higher education, or breathing room for socialism – dissidents found much wanting. These issues were partly the result of world economic recession, which in turn created additional public concerns about technology that reached new heights in the 1970s. In response to the first Oil Crisis of 1973, the FRG attempted to overcome the country’s 96 percent dependence on oil with the building of nuclear power plants; the same solutions were sought by East Germany.\textsuperscript{44} However, the prospect of expanding nuclear technology was no less troublesome to many citizens. Missile proliferation had already prompted the increase of anti-nuclear sentiment and emergence of green parties, but the USSR’s nuclear accident at Chernobyl in 1986 created active anti-atomic movements across the political spectrum and the East-West divide.

Beyond the prospect of human annihilation, at issue were the ways that advanced technological systems challenged the very structures of democracy. The technology to

make an atomic bomb, for example, was not a simple matter of manufacture, but an entire system that involved a highly specialized technocratic elite and large-scale political support. The immensity of the bomb’s destructive power also required governments to shield the public, which included keeping the populace in the dark about it. Thus, the bomb illustrates what philosopher Langdon Winner has called the “internal politics” of technology. Though scientists may have created the atomic bomb with the purpose of defending democracy during World War II, it had undemocratic consequences. Not only was the bomb shrouded in secrecy from the public, but it was also deployed by military, not public, command. The problem of administering advanced technology for democracy, however, extended far beyond weapons, since the new complexities of big science meant that a technocratic elite would make decisions of broad social impact without having to submit directly to public mandate.

Still, national economies were also dependent upon technological developments, which made any extremely critical posture towards technology difficult. In fact, Cold War geopolitics fostered many productive technological revolutions in this period, such as nuclear power, computer processing, and space exploration. Certainly, technology facilitated national identity during the geopolitical conflict by generating both material and psychological tensions – or victories. Technology contributed negatively to a sense of nation in terms of sheer opposition; German citizens went to sleep at night knowing that they were the targets of short- and medium-range atomic missiles that existed just across their border. On the other hand, technology signified national strength. On both

46 D.J. de Solla Price characterizes the postwar transformation as one of “little” to “big science,” Derek J. de Solla Price, Big Science, Little Science (New York: Columbia University Press, 1963).
sides of the Wall, the rebuilding German economies exploded, creating "economic miracles," and were leaders in their respective spheres.\textsuperscript{47} The presence of technology assured not only the availability of basic needs for citizens, but even indicated the possibilities for abundance. In the latter years of the standoff, the GDR’s inability to develop comparable technological achievements, or translate the technologies they possessed into easily available household products, contributed to a sense of disgruntlement and even deprivation in comparison to their Western siblings.\textsuperscript{48} However, the conflict affected West Germany equally, in the sense that the US/USSR contest transformed the nature of markets, exchange, and capitalism itself.\textsuperscript{49}

The fruits of economic success even led some to the opposite impulse, or an embrace of the notion that technology would result in democracy, in such a way that can only be called utopian. After Nazism, supporting futuristic technology was one way to affirm a departure from the reactionary impulses of the past.\textsuperscript{50} Thus, even shortly after the atomic bomb, enthusiasm for nuclear energy survived, as manifested by plans for atomic cars, dreams of controlling the weather, and nuclear test site visits.\textsuperscript{51} For West Germany, the economic miracle of the 1950s additionally helped the case of technological enthusiasts, who now proclaimed an intellectual lineage to the Weimar

\textsuperscript{47} Ibid., 69, 98, 110. Recovery in the GDR, termed the "other German economic miracle," was also underway, although it did not reach the success of the West. Still, Eastern production in 1952 was 108 percent of 1936 levels and, between 1964 and 1967, the GDR achieved an impressive growth rate of 5 percent with 7 percent industrial output.


\textsuperscript{50} This is Feenberg's interpretation about Habermas's slowness to condemn technology in postwar life, Feenberg, "From Essentialism to Constructivism," and does not deny the technological character of fascism that Herf unfolds in his work.

\textsuperscript{51} Paul Boyer, By the Bomb's Early Light; Pringle, The Nuclear Barons.
Republic destroyed by Hitler. East Germans, on the other hand, declared that they were unleashing a "scientific-technological revolution" whose end result would be harmonious and democratic communism. While the GDR and other Eastern Bloc states may not have been democracies according to many authorities on the subject, it is clear that their legitimacy, like the legitimacy of liberal democratic states, lay in their aspiration towards liberty, equality, and fraternity. By 1989/1990, the various conclusions of liberal democrats that technology indeed ended in democracy were perhaps predictable given the economic and political success of the Western nations.

Given the democratic and technological nature of victory in 1945, it was perhaps expected that the terms of the Cold War contest – democratic character and technological prowess – had become intertwined as well. Decades into the cold conflict, philosopher Herbert Marcuse could still envision the possible realization of a democratic utopia through technology, because technology provided the conditions for material abundance for the multitudes and not just the elites. It is also unsurprising that all were not entirely persuaded that a combination of democracy and technology was possible when faced with the potentially negative implications of technology for democratic life. The terms of Cold War contest, and all their attendant issues, converged spectacularly in technology museums, one of the most beloved cultural venues in both Germanies.

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52 Weber and Engelskirchen, Streit um die Technikgeschichte, 3.
53 Examples of other positions include the view that technology promotes democracy because tools like Internet communication permit Chinese democratic movements to subvert communist authorities. Another view believes that technology, as an instrument of economic trade, promotes democracy by establishing relations with nations having poor human rights records like Indonesia. According to the argument, this exposes the populace to liberalizing market forces. Proponents of this view also sometimes argue that technology contributes to a tendency toward democratic liberalism in the larger pattern of human history, as did Fukuyama in The End of History and the Last Man. Technology liberates in this case because it creates the equalizing conditions that promote individuation and the foundation for a public itself.
Introduction

Utopia and ideology in technology museum education

The quandaries of technology and the battlefield of ideology after 1945 set the parameters for a new relationship between educators, who ranked among the intellectual elite, and the public. After fascism, educational authority was a problem. Nazi politics had damaged the relationship between an expert authority and the public, since it exemplified how state institutions and their experts could fail the public and suppress independent behavior. Matters of authority were not aided by the postwar explosion of the public sphere, or by the dwindling likelihood of authoritative answers for any area of public life including scientific policy.

Museum educators in particular faced pressure to heed the desires of the public. It was becoming clear to museum administrators and others that they would have to contend merely with the emerging role of the museum as a “mass medium,” but also with the practical and theoretical demands of serving an avowedly democratic and public institution. Already in the 1950s, complaints existed about “high culture” (Hochkultur) being too high, especially given that the state and not private donors increasingly subsidized culture budgets. Critics also laid this accusation at the doors of museums. Following the worldwide political protests of 1968, cries for a revolution within museum structure and philosophy reached their height during the International Council of Museum’s (ICOM) Paris/Grenoble annual conference of 1971. “Put the Mona Lisa in the subway, not in the Louvre!,” advocates cried.56

The degree of these challenges multiplied in the 1970s and 80s as the "museum boom" hit. Not only did the number of museums worldwide increase spectacularly, but yearly visitor counts also often doubled if not tripled. Overcrowding was a major problem and personnel were often stretched to the limit. 57 Germany – on both sides of the Wall – enjoyed enormous success in art and history museums, and in displays of science and technology as well. In both East and West, displays of technology made up a significant part of the cultural landscape. By 1988, the majority of 2,400 museums in West Germany were technical museums and boasted an attendance of over 60 million visitors, while all of East Germany enjoyed access to monuments to technological history, a point of envy for historians abroad. 58 Though sensitivity to public response may have been a part of earlier programs and installations, the sheer volume of visitors made it a top priority afterwards. 59

The tensions between professional obligation and public duty for technology

57 Marking the inauguration of the "boom" in West Germany was a 1977 exhibition of the Württemberg Landesmuseum in Stuttgart that 671,000 people visited in 72 days. Numbers climbed in both Germanies; the western half saw 13.9 million visitors in 1970, 35.3 million in 1980, and 73.8 million in 1990, which were spread across 501 museums in 1970, 805 in 1980, and a whopping 2,622 in 1990. The much smaller GDR still boasted 751 museums, see Katharina Flügel and Arnold Vogt, eds., 40 Jahre Museologen-Ausbildung in Deutschland: Beiträge zu deutsch-deutschen Kulturdialogen; Katalog zur Ausstellung Museum für Angewandte Kunst Köln September bis October 1993 (Alfter: Verlag und Datenbank für Geisteswissenschaften, 1993), 64; Pommerin, introd Culture in the Federal Republic, 14-15.


59 Scholars have offered numerous reasons for the boom, including technology's impact upon culture and consciousness. Huysen enumerates a host of possible contributing factors: compensation for the lack of national culture, a way to gain a sense of temporality and authenticity in an age of simulacra, to use the term of postmodernist theorist Jean Baudrillard, or an expression of the Kulturgesellschaft (cultural society) itself, in which "cultural activity functions increasingly as a socializing agent comparable to and often even against the grain of nation, family, profession, and state," Huysen, Twilight memories, 32. See also museologist Zacharias's introduction, and his comment on an essay by colleague Heiner Treinen in 1973, Wolfgang Zacharias, ed., Zeitphänomen Musealisierung: Das Verschwinden der Gegenwart und die Konstruktion der Erinnerung (Essen: Klartext, 1990).
museum educators became clear in their practices since museums, as educational institutions of the public sphere, did not merely trade in utopias but also enacted concrete policies within the particular context of a nation-state. In general, education is an arena in which the difficulty of bridging ideals and policy is acute. When a state is democratic, people expect that public institutions and services will encourage democratic behavior, thinking, or purposes. Yet, as educators Joel Westheimer and Joseph Kahne have argued, the various citizenship behaviors that teachers attempt to inculcate can correspond to different ideas about democracy. For example, educating citizens to be personally responsible, that is, to take part in blood drives, do their recycling, obey the laws, and so forth is not the same as educating children to assess critically the larger structures that contribute to patterns of injustice in society. The two can even oppose one another, with the former tending towards a conservative politics and the latter encouraging more radicalism.

However, technology museum educators were simultaneously members of the intellectual elite, both as educators and especially regarding technology. Their role had developed with the larger emergence of professional fields during the late nineteenth century, and reflected the need for professional advice in an increasingly interdependent and complex world. Indeed, educators in technological museums knew more about technology, and its potential benefits and harms, than most of the population. It so happened that many of the technologies that created anxiety, like nuclear energy or oil production, were also hard to understand. At the same time, the very function of

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museums was based upon the idea that they were a public resource. Thus, museum personnel were educational authorities whose purpose was to guide the public towards personal and communal ideals, in this case with respect to technology.

These educators were also enmeshed in Cold War politics, a context that was explicitly and highly ideological. In hindsight, if not at the time, education clearly had to respond to a geopolitics that sought all kinds of tools in the effort to win – or shape – “hearts and minds.” As Peter Grothe wrote in his journalistic account of 1958, Winning people's minds is the most important business of the twentieth century -- and also, perhaps, the most fascinating. [Public affairs experts] say that the really important theater of operation now is not in the scientific laboratories but in the attempt to convert people to the ideology of the East or the West. Nowhere is the struggle of conversion and counterconversion more lively than in East Germany. For educators in East Germany or any of the other socialist states, it was obvious that education and politics were inextricably tied. Postures of neutrality were politically suspect since only a positive affirmation of socialist values could guarantee the protection of democratic values. Thus, when it came to museums, the GDR's renowned museologist Klaus Schreiner maintained that “museums – as ideologically mediating institutions – do not stand ‘neutrally’ above all classes.” In the West, however, ideological politics seemed contrary to the requirements of democratic practice after 1945. Yet, despite the demands for “apolitical stances,” “neutrality,” “objectivity,” or anti-biased perspectives, Western democratic education was also premised upon the

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support of ideals like liberty, equality, and fraternity, even if their significance was essentially contested.

Ideology, which involves powerful, uniform interpretations of the world, is a slippery notion. The sociologist Louis Althusser defines ideology as a representation of the "imaginary relationship of individuals to their real conditions of existence." It also has function-like properties, because ideology creates believers, or makes an individual into the "subject" of larger processes. Moreover, ideology operates on a social level, since the deep framework of social legitimacy that ideology provides only works when accepted by both those in and out of power. Most simply, ideologies make imaginary relations in the world seem powerfully "real," or concrete and stable.

Thus, ideologies parallel the kind of imagination and operation at work in all museum constructions. When museum educators engaged with the topics of technology and democracy, they did so in a controlled space of their own making. It was also a space that was in no way neutral. What made German technology museums of the Cold War specifically both utopian and ideological was that educators tried to tie the very contested realms of technology, democracy, and education unambiguously together. In a context where legitimacy rested upon the "right sort" of democracy and the "most advanced" technology, however these qualitative matters were quantitatively evaluated,

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67 By bringing together ideology and utopia, this study differs from the classic formulation by sociologist Karl Mannheim in maintaining a clear distinction between ideology and utopia. Levitas argues that he makes a specious distinction between a present or preservationist attitude and a future or transformative orientation. In any case, the imaginative processes involved in both utopia and ideology suggest that they are intertwined much more closely than Mannheim argued. Levitas, The Concept of Utopia, Karl Mannheim, Ideology and Utopia: An Introduction to the Sociology of Knowledge, trans. Louis Wirth (1929; repr., London: Routledge & Kegan Paul, 1948).
German Cold War technology museums could not help but engage on utopian terms. What then made them “ideological state apparatuses” were the political lessons for visitors that their combinations of technology and democracy contained.

Four technology museums in particular offer exemplary instances of these lessons. Originally begun in 1903, the Deutsches Museum in Munich refashioned its conservative politics of cultural engagement to fit the fledgling democracy of the Federal Republic. The 1960s saw the founding of two museums on the other side of the Wall. The Polytechnical Museum of Schwerin aimed at a happy society of productive personalities that intertwined notions of historical inevitability and centralized planning. Alternatively, the Technical Museum of Dresden showed how technology would realize socialist ambitions with a worldview of interconnectivity that incorporated recent theories of machine communication and learning. Finally, the Museum of Transportation and Technology in West Berlin, first opened in 1983, created an open marketplace of technological display that rejected the traditional elitism of the museum, and even encouraged critical views of technology. In the end, all the educators suppressed the social tensions of technology in order to support national cohesion in the face of geopolitical challenges. The resulting contradictions show that the paradigms at work contained not only utopian descriptions, but ideological prescriptions for behavior as well. Though the final case of Berlin comes closest to departing from these lines, it still upheld the utopian and ideological dimensions of technology education in ways that will be discussed in the last chapter.

Though undoubtedly informed by opposing ideological stances, museums in East and West in fact faltered along the same lines in their pursuit of democratic technological
education. After all, by belonging to institutions that claimed to reject authoritarian fascism, all technology museum educators in Cold War Germany sought to realize the democratic education of technology. Thus, while each museum accomplished its educational tasks in a singular way, following national and local agendas as well as the interests of their main directors, they all claimed that technology promised the realization of democratic ideals. They also proclaimed their opposition to the indoctrination practiced by the other side, alongside their commitment to a democratic style of education.\footnote{Antonius Holtmann, "Probleme der politische Bildung in der Bundesrepublik Deutschland und in der DDR," \textit{East European Studies} 1 (1984).} In sum, technology museum educators all argued that there was a positive correlation among technology, democracy, and education, in spite of the complications that each aspect presented to this equation. However, for an avowedly antifascist education, and nation, the question remained: to what extent did these museum spaces allow visitors to make independent conclusions about technology's impact upon society?

The museums in question lend themselves to this interrogation because of their focus on technology as a theme or phenomenon that followed a historical, and political, progression.\footnote{Klemm argues that the first technological museums are tied to encouragement of commerce during Enlightenment, Klemm, \textit{Geschichte der naturwissenschaftlichen und technischen Museen}, 43. What I am interested in, however, is what Radkau notes: a difference between the international exhibitions and the Deutsches Museum in which technology itself has become the major theme of consideration, Joachim Radkau, "Zwischen Massenproduktion und Magie: Das Deutsche Museum: Zur Dialektik von Technikmuseen und Technikgeschichte," \textit{Kultur & Technik: Zeitschrift des Deutschen Museums München} 16, no. 1 (1992): 55.} These museums were different from, for example, large collections of transportation technology that still shared a theoretical framework with seventeenth-century treasure and wonder chambers. More akin to what Victor Danilov termed "comprehensive, [and] industrially-oriented" museums, the technology institutions of
interest here focused on large-scale technologies and their effects.\textsuperscript{70} These museums received support from industry, but they were not industry-owned. Furthermore, they tended to speak to a national or international audience, rather than regional visitors alone. Insofar as they relied upon historical artifacts, technology museums were different from the new science centers like Frank Oppenheimer’s Exploratorium in San Francisco, whose custom-made gadgets demonstrated scientific and technological principles.\textsuperscript{71} Ultimately, technology was not solely an object of curiosity in these museums, but a progressing story whose significance for society needed to be understood.

\textsuperscript{70} Victor Danilov, \textit{Science and Technology Centers} (Cambridge, MA: MIT Press, 1982).
\textsuperscript{71} Ibid; Starn, "A Historian's Brief Guide to New Museum Studies."
Now and then I would leave the archive and stroll through the museum, where every human invention had been reconstructed. You pushed a button, and dioramas of oil exploration came to life with working drills, you stepped inside a real submarine, you made the planets revolve, you played at producing acids and chain reactions. A less Gothic Conservatoire, totally of the future, peopled by unruly school groups being taught to idealize engineers.

— Umberto Eco, *Foucault’s Pendulum*

**CHAPTER 1 · LEGACIES AND CONTINUITIES**

**The culture of responsible engagement in the Deutsches Museum**

In a 1970 speech at the Deutsches Museum, the professor and chemist Carl Wurster, winner of the annual Max-Planck-Society Harnack Medal, poignantly pondered the predicament of “so many people, particularly in intellectual circles, who have exceptional standards of living but are nonetheless dissatisfied with so many things.”¹

The problem of discontentment was one that, in the opinion of Wurster, only information could fill. Education, intra-generational exchange, and discussions between the sciences and liberal arts would create a much-needed flow of information. For Wurster, it was precisely because our era seems so fragmented and restless that we need to build bridges to and among each other instead of alienating one another. We need to be prepared to learn from one another, to teach one another, to inform one another. We need each other.²

He maintained moreover, two years after the challenges to educational authority in 1968, that the Deutsches Museum was perfect for both the task of cultural reconciliation and democratization. “The masterful creations [in the Deutsches Museum] ... were made

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² Wurster, "Über das Bedürfnis nach Information."
with the very goal of informing,” which was for Wurster “the predecessor to ‘democratizing’ – to use a catchphrase of our times – technological civilization.” As facilitators for conversation and civilization, then, both modern technology and the Deutsches Museum were integral to democratic success.

However, the problems with connecting technology, culture, and democracy were akin to the issues that made Wurster a problematic figure after the war. Wurster himself represented troubling historical continuities for West Germany. Though acquitted of crimes against humanity in the Nuremberg Trials – his company manufactured the Zyklon-B gas used in concentration camps – he was nevertheless a recipient of medals for services under both Hitler and, eleven years later, the new republic. Thus, Wurster’s continued recognition first challenged the notion that technology had particular congruence with democracy as opposed to dictatorship. Secondly, his case suggested that the postwar departure from Nazism was far from complete, specifically when it came to conversations about the past and the role of culture. If an open discussion grounded in the common foundations of technology and culture was supposed to be the means of amending fissures and deep problems within society, then Wurster’s success suggested that West German dialogue was less than frank.

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3 Ibid.
4 Zyklon-B was only one of the charges that directors of I.G. Farben had to face. For service under Hitler, Wurster was awarded the Ritterkreuzträger des Kriegsverdienstkreuzes in 1944; he later received the service medal for West Germany (Verdienstkreuz der Bundesrepublik Deutschland) in 1955. He was also awarded the 1966 Carl Duisberg Prize of the Gesellschaft Deutscher Chemiker for contributions to the field of chemistry. For the Ritterkreuz documentation, Dieter Zielke helpfully provided the following sources: Patzwall, Klaus D., Die Ritterkreuzträger des Kriegsverdienstkreuzes 1942 - 1945, (Hamburg: Verlag Militaria-Archiv Klaus D. Patzwall, 1984), 109; Patzwall, Klaus D. “Liste der Inhaber des Ritterkreuzes des Kriegsverdienstkreuzes mit und ohne Schwerter von 1942 – 1945,” Unpublished, Last updated 1 March 1993; Trials of War Criminals before the Nuremburg Military Tribunals (TWC; 1951/52): Der IG-Farben-Prozeß: United States of America vs. Carl Krauch et al. (Case No. 6), Vol. VII, Anhang "A" der Anklageschrift, 76 ff.
As Deutsches Museum educators pointed out the technological foundations of culture and tried to foster a responsible cultural engagement, their exhibitions were also more problematic than they seemed. Against the fears of destructive technology, proponents and personnel of the Deutsches Museum argued that, in fact, technology reinforced the stability of society, and therefore supported the possibility for harmony and democracy. Specifically, the museum provided a dialogue-based forum based in seemingly apolitical cultural values for citizens and helped them to assume active responsibility for society. Yet the likelihood that responsible cultural engagement could solve tensions introduced by technology was a dubious prospect after 1945. Fascism had already demonstrated that culture was not stable but fraught with the contested political issues of society and nation.

Culture and agency in the technological paragons of Munich

What the values of culture, civilization, and technology meant in the postwar field of rubble was an open question. In May 1945, Germany was literally devastated. Allied bombing had decimated or damaged half of the housing in cities and a quarter of the nation’s housing overall. By the end of the year, industrial production had only recovered 20 percent of its pre-war capacity.\(^5\) The destruction also produced a cultural wasteland; in the immediate aftermath, the country was without a single functioning newspaper, magazine, publishing house, or radio station. Culturally renowned Munich, which Hitler made “the capital city of the [Nazi] movement” in 1935, had also been an important target of air raids during World War II.\(^6\) From a population of 840,586 in

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\(^5\) Turner, *Germany from Partition to Reunification*, 6-7.

1939, Munich dropped to 674,154 inhabitants in 1945. Among the most heavily damaged of the city’s many institutions was the Deutsches Museum. One of the largest and oldest technical museums in the world, the Deutsches Museum had offered visitors 15 kilometers of displayed technology before the attacks. Both of the museum’s buildings, which lay in the heart of the city on a small island in the Isar River, and much of the collection suffered significant damage.

Although the Deutsches Museum officially ended the rebuilding process only in 1969, more than twenty years after the war, it flourished nonetheless in the postwar period and achieved levels of growth never experienced previously. The population of

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7 Statistisches Bundesamt, ed. Statistisches Jahrbuch für die Bundesrepublik Deutschland 1952 (Stuttgart: Metzler-Poeschel), 22.
10 Mayr estimates 80 percent.
Chapter 1

Munich also expanded to 990,000 by 1956 and reached a high point of 1,317,700 in 1975.12 The entire country prospered as well. Observers of the West German economy called it an “economic miracle,” for it seemed no less than that: between 1948 and 1966, production caught up with and surpassed anything attained before the war. Under the guidance of economic minister Ludwig Erhard, the Federal Republic of Germany pursued a policy of welfare-state capitalism (soziale Marktwirtschaft). With American and Allied capital from the Marshall Plan and the Korean War production boom of 1950, output blossomed and goods became readily available in West Germany.13

However, reconstruction was only the first of many issues that confronted the Deutsches Museum and the nation. Like many other public institutions, the museum’s past affiliations with Nazism potentially compromised its reputation and authority.14 The taint was perhaps poetically appropriate in a city of “Compromise,” referring to the famed early effort of British Prime Minister Neville Chamberlain to stave off war with Hitler in exchange for Czechoslovakian territory.15 Yet after the war, museum educators argued that the Deutsches Museum could support democracy. A democratic society in the postwar sense was probably furthest from the intentions of the socially conservative founders of the museum. Nevertheless, postwar Deutsches Museum educators believed that technology could help German society reform into a democracy, and that the museum could demonstrate how this was possible.

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12 Statistisches Bundesamt, ed. Statistisches Jahrbuch für die Bundesrepublik Deutschland 1957, 1972, 1976; Statistisches Bundesamt, ed. Statistisches Jahrbuch für das vereinte Deutschland 1992. In 1970, the population was 1,310,000 and in 1990, 1,219,000.
14 Duffy, “Representing Science and Technology.”
15 The Munich Compromise of 1938. For a consideration of how memory of appeasement at Munich figured powerfully into US policy afterwards, see Jeffrey Record, Making War, Thinking History: Munich, Vietnam, and Presidential Uses of Force from Korea to Kosovo (Annapolis, MD: Naval Institute Press, 2002).
At the same time, the Deutsches Museum retained not only a masterpiece notion of technology, but also the politically conservative notions of culture and civilization that it implied.\textsuperscript{16} Against the context of Munich’s rich, regal past and significant art museums, the Deutsches Museum offered the crème de la crème of scientific and technological wonders regardless of their national origin. Guiding the acquisitions and exhibitions of the “Museum of the Masterpieces of Natural Sciences and Technology” was the idea that certain inventions were key and that technological, if not cultural, history turned on their creation. The allusion to masterpieces of the art and music world was deliberate, for founder Oskar von Miller and his associates hoped to cash in on the “cultural capital” of traditional Bildung elites.\textsuperscript{17} Therefore, their inventors were considered maestros worthy of remembrance and honor. The Deutsches Museum even possessed an Ehrensaal, a kind of scientific hall of fame, with busts of the men that museum administrators had selected and inducted.\textsuperscript{18}

From the beginning, culture in the Deutsches Museum had moreover possessed the character of a social and national binding agent. Though not exactly synonymous with nation, the notion of culture in the museum echoed ideals of culturally based “Germanness” that had served as a foundation for nationhood since the time of

\textsuperscript{16} There is a general cultural conservatism in the history of technology according to Weber and Engelskirchen, Streit um die Technikgeschichte.

\textsuperscript{17} Regarding the association between art and technology, see Klemm, Geschichte der naturwissenschaftlichen und technischen Museen, 16. As an early “form” of technology museum, Klemm points out that the Uffizi Gallery represented all the areas of Kunst, or art and artifice.

\textsuperscript{18} Dyck, Wege und Ziele des Deutschen Museums, 21-23, confirms that up to this point there were no women in the Ehrensaal, which included von Zeppelin, Alexander von Humboldt, Lilienthal, Ludwig I von Bayern, Krupp, Leibnitz, and Friedrich II von Preussen. In the 1950s, this was still apparently the case, see L. Heuing, Letter to Director of Smithsonian Institution Leonard Carmichael, 25 September 1959, DM VA 0367; Max Löhrich, Letter to Deutsches Museum, 19 August 1951, DM VA 0366.
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philosopher Johann Gottfried von Herder. For example, though the museum contained the world’s inventions, the Ehrensaal was filled only with Germans, whose scientific achievements were on display as a partial history of German Volk and civilization; national culture was therefore another aspect of the Deutsches Museum’s “cultural work.” In addition, the regular visits by political figures affirmed the institution’s civic role. For example, Bavarian and Prussian royalty were present on opening day, including Kaiser Wilhelm II himself. Every year, the honorary president of the museum board was in fact the German chancellor, excepting Adolf Hitler, who excused himself by stating other pressing obligations. Finally, even the museum’s title had national overtones and aspirations. Literally “The German Museum” – von Miller was inspired by the British example – the museum’s name tied the power of the nation to technological prowess.

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19 Benedict Anderson’s idea of an “imagined community” is helpful here, especially given the role of communications/print culture in his work, Benedict Anderson, Imagined Communities: Reflections on the Origin and Spread of Nationalism (London: Verso, 1983).
22 The founding of the museum in Munich and not the capital city of Berlin was also bound up in issues of nation and culture. It was an attempt to extend national culture and identity beyond Prussia, and support a powerful counterpoint to Prussian dominance as well. The creation of the German nation-state had taken place only thirty-five years earlier, and for centuries before, the geographical area of northern Mitteleuropa consisted of a multitude (at some points over a hundred) of different independent cities, duchies, and monarchies with their own jurisdiction. Although all possessed a closely related history as part of the Holy Roman Empire, a linguistic culture, and increasingly deep economic ties, the single legal entity of Germany formed only in the last quarter of the nineteenth century. Within this “second empire,” Munich remained the home of a powerful Bavarian dynasty that was interested in influencing the new government while maintaining as much autonomy as possible. Duffy, "Representing Science and Technology"; Füßl, ed., Geschichte des Deutschen Museums; Hecht, "Technology, Representation and the German Nation"; Hochreiter, Vom Museumsgraben zum Lernort; Maria Osietzki, "Die Gründungsgeschichte des Deutschen Museums von Meisterwerken der Naturwissenschaft und Technik, 1903-1906," Technikgeschichte 52, no. 1 (1985); Mayr, "Historical Survey." However, Hochreiter notes the social dimension: tension between Bavaria and Berlin. The tension between the local and national identity of the Deutsches Museum existed.
Thus, by 1945, the Deutsches Museum had created an identity for itself that intertwined culture and nation, a position from which it would help facilitate order and harmony in society. When courting possible patrons, for instance, administrators argued that by supporting the cultural aims of the museum, benefactors could help invigorate national pride. After the first World War, founder von Miller would speak of the national humiliation that a number of Germans felt when asking for financial support. As museum administrators claimed to speak to and for society, it was also clear that they deferred to a certain "civilized" strata in their ideas of social order. In its very concept, the Deutsches Museum had brought together the "natural" sphere of internal cultivation denoted by "Culture" and the "outer" mechanized world of "Civilization" that were at war in the Bildung battles of the late-nineteenth and early-twentieth century.\textsuperscript{24} The museum could therefore help other "common" strivings toward Kultur and a reconciled nation.\textsuperscript{25} It was as a cultural institution that the Deutsches Museum could, according to von Miller, do everything from awakening joy in work to promoting peaceful productive labor. This was in contrast to the demands of red revolutionaries for radical transformation especially after the German Revolution of 1918/19.

Appeals for financial help in the era of "No Experiments!" (\textit{Keine Experimente}) that followed World War II showed that culture and nation remained important

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\textsuperscript{23} Radkau, "Zwischen Massenproduktion und Magie": 57.

\textsuperscript{24} Fritz Ringer points out that \textit{Kultur} (Culture) and \textit{Zivilisation} (Civilization) were significantly different, Fritz Ringer, \textit{The Decline of the German Mandarins}, 87-89. The particular genius of the Deutsches Museum seems to me that it brought these two ideals together.

\textsuperscript{25} Oskar von Miller et al., Letter to Berlin Reichsministerium des Innern, 8 March 1920.
components of the museum that made its continuation worthwhile.\textsuperscript{26} The museum was no longer the “national institution with which every German identified” before the war, museum officials sadly recognized, and had been reduced to the level of a Munich sightseeing stop.\textsuperscript{27} However, pleas for continued support reminded the corporate audience of the 1950s that “here in the Deutsches Museum, we cherish technology as a cultural achievement,” and even poetically sacralized the space.\textsuperscript{28} Administrators cast the necessary renting of their auditorium as a film hall as a “profaning of our beautiful Kongressaal (auditorium)” and Chairperson Otto Meyer used religious vernacular when stressing the particular service of the Deutsches Museum to leaders of applied sciences and industry.\textsuperscript{29} “Help us,” he implored, “in our rebuilding of the Deutsches Museum, that should be also indeed your museum, that is indeed a temple of honor to all technological sciences and industry!”\textsuperscript{30}

The continued references to culture in the museum reflected a significant assumption that the notion of culture had emerged unscathed by Nazism, and could therefore still ground German society and the new nation. It was a strange argument to

\textsuperscript{26} Keine Experimente was the campaign platform of the FRG’s first chancellor, Konrad Adenauer (1876-1967), who maintained his fourteen-year reign partly based upon such arguments.

\textsuperscript{27} Mayr, Wiederaufbau, 145. Nonetheless, they felt that the Deutsches Museum was still something of a barometer for general cultural feeling. The “general lack of interest in [all] cultural institutions like the Deutsches Museum” explained, for example, the drop in attendance in 1949 during their yearly assessment, Deutsches Museum, ”Über das 45. Geschäftsjahr 1948/49 und Bericht über die Jahresversammlungen 1949 und die 38. Ausschusssitzung des Deutschen Museums [Verwaltungsbericht],” (Munich: Deutsches Museum, 1949), 24.


\textsuperscript{29} Deutsches Museum, ”Über das 47. Geschäftsjahr 1950/51 und Bericht über die Jahresversammlungen 1951 und die 40. Ausschusssitzung des Deutschen Museums [Verwaltungsbericht],” (Munich: Deutsches Museum, 1951). What these founders would say if they knew that IMAX films became a part of the Deutsches Museum’s regular offerings in the 1990s, is not difficult to guess. Otto Meyer (1882-1969) trained as an engineer and was the General Director of Maschinenfabrik Augsburg-Nürnberg (MAN). He later served as director from 1953-1963, Mayr, Wiederaufbau.

make in a city that formerly housed the fascist House of German Art and had ostensibly showed how human culture and civilization were, to use Hitler’s words, “inseparably bound up with the existence of the Aryan.” Yet, as supporters of the Deutsches Museum reminded listeners, technology was necessary to culture. They pointed out that technology provided the foundations upon which the arts could be built (musical instruments were after all a kind of technology), and thereby supported civilization and human life itself. Soon after the war, the museum’s General Director Otto Seeling affirmed that the Deutsches Museum was above all dedicated to technology — not Nazism — and, in his request to industry for support, argued that the museum had a significant role to play in rebuilding both the German economy as well as Kultur.

In fact, the museum’s support of culture became a point of ideological contrast with the East. In the opinion of professor and chemist Karl Winnacker in his 1962 speech made before the Deutsches Museum, “we have a quite remarkable joy for technology in Germany.” On the one hand, this cultural claim for Germans, made just prior to the raising of the Berlin Wall, had the unmistakable undertone of political unity:

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technology could provide a cultural bond for a divided nation.\textsuperscript{34} At the same time, Winnacker made his declaration within the context of the Cold War, in which attitudes towards technology were polarized in the world battle between socialism and democracy, totalitarianism and freedom. Rather than succumbing to destructive nihilism, both technology and the Deutsches Museum had become to enthusiasts like Winnacker crucial tools for culture, nation, and all good things. The chairperson of the museum’s head council (\textit{Vorstandsrat}) Siegfried Balke, who was also Minister of Atomic Energy and Water from 1953 to 1962, agreed. It was not merely a “high calling” (\textit{hohe Pflicht}), but a “rock-hard (\textit{eiserner}) necessity” to grant the greatest attention to scientific research and education. It was necessary, at least, if “Western culture wants – no, needs! – to emerge victorious in the deciding battle of the world-wide standoff.”\textsuperscript{35}

At bottom, the claims for culture, technology, and civilization, all of which would be enlisted for the creation of democracy, revealed an optimistic stance on the power of human agency in the museum. In his closing speech of a yearly gathering at the Deutsches Museum entitled “Remaining Master Over the World of Technological Objects,” Bavarian Minister of Culture Theodor Maunz proclaimed that the museum achieved an “essential cultural work.”\textsuperscript{36} The Deutsches Museum and the knowledge it

\textsuperscript{34} For example, a speech in the 1955 meeting touched on the divided German people and the Ministry for all-German issues (\textit{für gesamtdeutsche Fragen}), Deutsches Museum, “Über das 51. Geschäftsjahr 1954/55 und Bericht über die Jahresversammlungen 1955 und die 44. Ausschusssitzung des Deutschen Museums [Verwaltungsbericht],” (Munich: Deutsches Museum, 1955).


\textsuperscript{36} Theodor Maunz (1901-1993), professor of law at the University of Munich, was a principal figure in shaping West German constitutional law; his students include former chief justice of the German constitutional court and German president Roman Herzog (1994-1999). He was also a committed Nazi before 1945, who wrote anonymously for a far-right-wing newspaper well afterwards, Markus Dirk Dubber, review of Michael Stolleis, \textit{The Law under the Swastika, Law and History Review} 18, no. 1 (2000); Michael Stolleis, "Theodor Maunz - ein Staatsrechtslehrerleben," \textit{Kritische Justiz} 4 (1993); Michael
provided did more than facilitate a vital mastery over scientific and technological knowledge. As Maunz said, “I can only guide or lead what I know.” The museum also led “Techniker (technicians) out of the world of technical gadgets and operations – the ‘world of causality,’ or necessity – into the world of the history of human creations, in which human freedom exists.”

Technological education was even more necessary after World War II because it now contained the end goal of freedom. Yet whether the kind of freedom envisioned by the perspective of former Nazi members like Maunz converged with the demands of a democratic electorate was a live issue after 1945.

*Dialogue with the public: towards a new pedagogy?*

It was never enough that visitors to the Deutsches Museum merely revered industrial and technological contributions to culture, because the masses also needed to better comprehend them. The educational mission led museum personnel to founding efforts in what later became the discipline of the history of technology, but also to hold educational methodology as an important consideration in their exhibitions.

Interactive, button-engaged displays thus defined the museum as a whole. In fact, from the outset, one thing that distinguished the Deutsches Museum from other museums was its focus on pedagogy. In the words of Conrad Matschoss, a founding father of the museum, and of the history of technology as well, the museum’s greatest “cultural task” (*Kulturaufgabe*) was education, and specifically popular, or people’s, education (*Volkbildung*).
An educational philosophy was deliberately and consciously formulated in this “less Gothic Conservatoire” with the coming of the “hallowed” educator Georg Kerschensteiner, known for his pedagogical reforms and advocacy of vocational and civic education in the first decades of the century. By the latter half of the 1920s, however, Kerschensteiner increasingly aligned himself with conservative ideals as the topic of authority became more pressing in educational circles. He demanded in 1929 that technological education, and the Deutsches Museum in particular, “must dig deeper”: “a true educational method... must inform the visitor’s meaningful rational structure (das sinnhafte Geistesgefüge)” and generate reverence. Reverence, in Kerschensteiner words, was nothing more than the feeling of meek veneration before a sublime work whose impressive greatness and power strikes us with our insignificance [and] the museum, as an educational institution, must do everything to try and awaken this feeling of reverence through its organizational methods.

Thus, technology exhibitions were neither a chamber of rarities nor an entertaining show for visitors, but provided rather an encounter with the sublime that awakened awe and respect before great power. The kind of organizational methods that Kerschensteiner envisioned included the museum’s encyclopedic scope, which showed how “from chaos, [an organized] cosmos” emerged. Initial plans for the museum outlined forty

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41 Ringer, The Decline of the German Mandarins, 408.
43 Ibid.
departments, including mathematics, physics, land transport, textile machinery, and city municipal concerns like electricity.\textsuperscript{44}

The pedagogical aspect was not lost after 1945, but transformed according to the times. As new branches of technology emerged in the postwar period, for example, the Deutsches Museum quickly founded new departments to keep pace with the state of research. The focus upon social concerns also increased. In von Miller’s time, critics had commented on the overall absence of social issues, though museum advocates had argued that engineers at large and the museum personnel were indeed concerned about the general welfare.\textsuperscript{45} Technology, after all, improved mankind’s ability to cope with the world, but criticism of the Deutsches Museum nonetheless remained both then and afterwards.\textsuperscript{46} After 1945, the Deutsches Museum became a public institution also in the monetary sense, with the director now a paid employee of the state, and a decreasing percentage of museum funding coming from personal donations.\textsuperscript{47} Greater responsibility to the public was reflected by a small but significant change to the museum articles after the war. Instead of a “German national institution dedicated to honor the entire German people (Volk) and to serve as a example to follow,” the Deutsches Museum became an “institution beholden to public law (des öffentlichen Rechts).”\textsuperscript{48}

Another important change was the target audience. Before, the museum’s educational mission had often focused on workers. In the early years, von Miller had

\textsuperscript{44} Oskar von Miller, \textit{Technische Museen als Stätten der Volksbelehrung}.
\textsuperscript{45} Oskar von Miller, "Die Technik als Wohltätarin der Menschheit," (Haus der Technik, Essen: 1931).
\textsuperscript{46} Hochreiter, \textit{Vom Museentempel zum Lernort}. Osietzki, "Gründungsgeschichte."
\textsuperscript{47} Mayr, 60. This is not to say that public monies were not a part of the original venture; the city of Munich, for example, provided the land and utilities before and after 1945.
speeches focused on labor issues, for instance, and museum hours had working schedules in mind.\textsuperscript{49} Children had also been a concern, as some especially revealing works of the Nazi period showed, but not a central one.\textsuperscript{50} However, children became a primary focus as early as the 1950s, when technological educators began to note a lack of interest in technology among youths. For example, museum officials in 1955 took the opportunity of Oskar von Miller's one hundredth birthday to restate anew the central goals of the museum. "Represent[ing] a cultural-historical look at worthy examples of the masterpieces of science and technology" was the first aim they mentioned, but the second was the educational (erzieherische) dimension of the museum.\textsuperscript{51} It was a youthful audience in particular that the administration had in mind, and they sought ways to awaken young minds to natural laws and scientific limits.

In fact, the pedagogical aspect began to hold sway in a way that challenged the museum's cultural identity, or at least the high cultural position that institutions like museums normally occupied. "What actually defines the Deutsches Museum," declared former Atomic Minister Balke during the 1963 annual meeting, "is the fact that it is not a

\textsuperscript{49} An example of a speech: Miller, "Die Technik als Wohltäterin der Menschheit." Hours and reduced entry fees for workers were highlighted in 1931, Deutsches Museum, "Verwaltungsbericht 1930-31." In the 1949-50 year, however, the numbers focused on students, Deutsches Museum, "Verwaltungsbericht 1949-50." Reduced fees for students – along with military and Kraft durch Freude programs – began however at least by 1936-37, Deutsches Museum, "Über das 33. Geschäftsjahr Mai 1936 bis Mai 1937 und Bericht über die 26. Ausschuss-Sitzung des Deutschen Museums [Verwaltungsbericht]," (Munich: Deutsches Museum, 1937).


\textsuperscript{51} Deutsches Museum, "Verwaltungsbericht 1954-55."
museum. It is rather an educational institution." Deutsches Museum representatives were trying to move away from the sense that museums were sterile or elite, a trend that mirrored the times. The emphasis on youth education reflected a heightened sense of inferiority in early 1960s West German pedagogy. In 1963, the percentage of students who passed their Abitur, or university admission exams, was higher in East Germany than in the West. Then, Georg Picht's 1964 *The German Educational Catastrophe (Die deutsche Bildungskatastrophe)* launched a nationwide debate on the status of West German education. Calling the state of education in the Federal Republic a disaster, Picht both lamented the incommensurate attention paid to practical application and implied that access to higher education remained the purview of the privileged. Picht's work, along with eminent sociologist Ralf Dahrendorf's *Education Is a Civil Right (Bildung ist Bürgerrecht)* in 1965, shaped the new parameters of a debate that was also impacted by the population explosion in schools. Between 1965 and 1970, the number of high school students more than doubled from 958,000 to 2.2 million. University attendance across the postwar period grew dramatically as well: 108,000 students were registered in 1950-51, 213,000 in 1962/63, 585,000 in 1971, 1,314,000 in 1984, and 1,410,700 in 1988. 

Coinciding with the fallout from protests of the educational system between 1965 and 1968, and the official end of the museum's rebuilding process as well, a different kind of pedagogy began in the Deutsches Museum in 1970. With a new department on

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education and public relations and a new director, Theodor Stillger, the museum aimed to keep public obligations more in mind.\footnote{Deutsches Museum, "Verwaltungsbericht über das 67. Geschäftsjahr 1970 und Bericht über die Vorstandsratssitzung 1971," (Munich: Deutsches Museum, 1971).} In both Stillger and his recent hire Günther Gottmann, head of the fledgling PR department, the Deutsches Museum gained an orientation that emphasized the learning, not cataloguing, of technology. Theo Stillger did not have a scientific degree or formal training in museum studies, but vowed to double the numbers of visitors, engage the youth, and foster “practical pedagogy” \textit{(praktischen Pädagogik)} in the Deutsches Museum.\footnote{Mayr, \textit{Wiederaufbau}, 196-98; Füßl, ed., \textit{Geschichte des Deutschen Museums}, 161, 180-83. Theodor Stillger (1920-1982) became director of the Deutsches Museum in 1970. He was a surprising choice: his former post was as the director of the Vocational School of Glasswork (Glasfachschule) in Hademar (Hessen). With Stillger, the Deutsches Museum entered a necessary phase of reorganization given the growth of the institution.} Gottmann also had a non-scientific background. He was, in fact, a former Catholic seminary professor trained in philosophy, history, and theology. Losing his religious convictions, Gottmann moved to Brazil and worked on a documentary about the squalor of the country’s back alleys, for which he and his family were deported. Upon returning, his venture into the technology museum business was, Gottmann later said, “an accident.”\footnote{"Am wichtigsten ist der pädagogische Eros: Günther Gottmann, Gründer des Technikmuseums, Ex-Priester und Dokumentarfilmer, geht in den Ruhestand," \textit{Der Tagesspiegel}, 17 July 1999. Characterizing his actions as those of an average unemployed person, he went looking in the want ads and found the position advertised by the Deutsches Museum.} To be sure, Stillger’s and Gottmann’s philosophies neither stood for the entirety of such a sprawling institution as the Deutsches Museum, nor were they shared by its numerous specialists.\footnote{For instance, Hermann Auer, who was the scientific director from 1948 to 1971 and later represented West Germany in ICOM, was without question an influential presence; he becomes significant in chapter 4. Auer (1903-1997) was a professor of physics in 1943 at the University of Munich. Between 1948 and 1971, he served as scientific director of the Deutsches Museum, but also focused on methodological and pedagogical questions, and became president of ICOM-Germany (West) in 1969.}

Nevertheless, during the 1970s, the duo’s vocal presence shaped public reception of the
museum in noteworthy ways, which was no small thing considering the museum’s influence.

The changes to pedagogy also reflected movements within the museum world that followed the ICOM 1971 conference demands for more democratic approaches. In the words of Gottmann, “museum pedagogy [was] undergoing a revolution” even in the Deutsches Museum.\(^{59}\) The museum’s own research showed that their public was singular in comparison to others: most visitors, for example, did not visit any other museum in the course of the year, and 60 to 70 percent of their public were first-time visitors to the museum as well. They were, then, a very “unschooled” audience. Also, only every fourth visitor came from Munich, which suggested the museum’s broad national and even international appeal. Given this opportunity to reach a sector beyond the typical museum-going public, Gottmann declared, “the museum leadership of today’s Deutsches Museum wants more for the future. [We] want to make apparent technology’s significance in the larger context, or what ‘cultural-humane-social’ role it plays in history.”\(^{60}\) Thus, over and against research concerns and the museum’s elitist cultural bent as well, Gottmann and Stillger set an agenda that grappled with present-day issues. In a way, they adopted the pedagogical aims of von Miller and Kerschensteiner, but reinterpreted them for a new context and generation, and not without some resistance.\(^{61}\)

Reinterpretation did not mean, however, that the themes of culture and agency lost significance in the Deutsches Museum. Director Stillger problematized the

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60Ibid.; Klemm, Geschichte der naturwissenschaftlichen und technischen Museen. Nonetheless, the way museum educators have articulated this connection has changed according to context and need.

relationship between agency and technology, however. "The greatest danger to human existence" was what he called "the contradiction of technological control." On the one hand, society undoubtedly possessed the scientific and technological knowledge to transform daily living conditions for the better. However, contradiction remained in what Stillger considered to be the major problem of the modern age: humans could not at the same time anticipate the exact nature of the large-scale political, economic, and social upheavals that inevitably accompanied technological transformation.\(^{62}\) The solution he proposed to this dilemma was democracy, which "begins with a dialogue," something that the Deutsches Museum enabled the public to join by "advanc[ing] the level of general understanding with regards to technical and scientific processes."\(^{63}\) Because the facilitation of dialogue was seen as fundamental to democracy, Stillger said in a speech near the end of his tenure, the museum did "not take it lightly."\(^{64}\)

Yet Stillger also believed that the museum had to maintain a balance between representing sociopolitical aspects of technology and maintaining a modicum of objectivity. He wanted the Deutsches Museum to be socially relevant, but the prospect of being blown about by the winds of discussion was also a significant problem to Stillger, especially in an era of "democratized education." Though he affirmed the goal of showing what he called technology's "Janus-face," or both its positive and negative aspects, this was only so long as the administration fulfilled another job of the museum: to act as a collection house for the supreme achievements of research and technology.\(^{65}\)

In 1979, Stillger pointed out the museum's commitment to democratic dialogue through

\(^{63}\) Ibid.
\(^{64}\) Ibid.
the inclusion of other voices in lectures and publications. At the same time, Stillger felt that each technological object retained a certain integrity, or “objectivity.” The thing that Stillger called “objectivity” would best be preserved by leaving the main message, or the final point, to “the object itself.” In other words, the number of possible interpretations of an object was limited, and if not, then “every technological museum would lose its very reason for existence.” Ultimately, Stillger suggested that the museum staff were the final arbiters of a technological object’s significance or meaning. His contorted and oblique logic, however, begged the question: why exactly were technological objects so problematic?

Stillger’s reflections indicated an inherent tension not only in the Deutsches Museum, but also for democratic education at large. In the pursuit for conclusive knowledge, there was friction between a model of dialogue, which occurs on lateral, equal footing, and a hierarchically implemented pedagogy. Perhaps the more enlightening question regarding Stillger is not how, but which technological objects caused frustration. A survey of the exhibitions of the 1970s and 1980s clarifies not only the controversies that Stillger implicitly addressed, but also how the Deutsches Museum hoped to foster democratic education through technological objects.

The national tensions of cultural production

The Deutsches Museum used themes of culture and objects of technology in order to address social and cultural questions in many important ways quite opposed to the gleichgeschaltet, or regimented, politics of the Nazi period. Technology had been tied to the violent realization of an exclusively German society during the 1930s and 1940s, but

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66 Ibid., 16.
afterwards, museum officials tried to show how technology helped to create cultures of exchange and cooperation. Technological culture, its advocates maintained, could bridge chasms and create connections within society and among nations as well. Thus, for example, the museum became an advocate for humanitarian causes like world hunger. Showcasing the “Bread Against Hunger” (Brot gegen Hunger) exhibition from the German Bread Museum of Ulm in 1968 was more than an opportunity to address the problem of hunger in the world. The exhibit was also an occasion, due to its ecumenical backing, to bridge religious differences.\textsuperscript{67} As for international relations, the spread and growth of advanced technology was, after all, a supranational phenomenon responsible for the steadily growing numbers of tourists, and museum visitors that the Deutsches Museum hoped to see.\textsuperscript{68}

“Humanity” was a unifying ideal in the museum that, if realized, meant that world peace was possible, which was an important belief in light of the ever-present nuclear fear. “Humane technology,” for example, avoided divisions among and within societies. According to director Stillger’s reflections on a visiting exhibition of ancient copper from Israel, culture and technology were supposed to be part a unity, as they had in ancient times. Members of either group were not to regard culture or technology alone as “the


\textsuperscript{68} At least, this seemed to be the case according to 1959’s yearly review, and museum officials noted that they were quite pleased with the continued visits of and cooperative endeavors with foreigners, Deutsches Museum, "Verwaltungsbericht 1958-59," 24. Director Heuwing was therefore understandably distressed with the criticism – that same year – of the Smithsonian Institution’s director that suggested that the museum was trying to cast the industrial revolution as solely German. He wanted to know where Leonard Carmichael got the impression since they “earnestly strive to display and give credit...without respect to national differences and origins (excepting Hall of Fame, devoted to German scientists and engineers),” see Heuwing.
savior of mankind while regarding the other as its endangerment."\textsuperscript{69} At least one eloquent foreign visitor responded positively to this potential of the Deutsches Museum as a possible site of, in the words of his letter, crucially needed friendship and peace among the nations.\textsuperscript{70} If the presence of international collaborations in the museum can be taken for an attempt to meet this suggestion, then the Deutsches Museum certainly tried; exhibitions included one for the 1972 Munich Olympics and another of Israeli stamps.\textsuperscript{71} There was no controlling the political context, such as the massacre of Israeli athletes during the games, however.

The introduction of representations from other lands and cultures did not, however, negate a sense of national identity in the museum. In fact, the display of national differences made quite the contrary case even when, in accordance with the demands of "humane technology," the Museum occasionally acted in ways that potentially conflicted with West German economic interest during the slump of the 1970s.\textsuperscript{72} In the effort to foster broader international spirit, the Deutsches Museum invited an exhibition of "Design from Denmark," which represented a "conscious" entrance into the realm of current-day cultural discourse and thus, according to the administration, a noteworthy change. Stillger's opening speech proclaimed the Deutsches Museum to be a "House of Encounter (Begegnung)" among nations and across time, which was evidenced

\textsuperscript{69} Theo Stillger, "Timna-Tal," 13 September 1973, DM VA 0910. Included in this consideration was also a third group: "cult," or religion, and an intended reference to the similarity with the word "culture."

\textsuperscript{70} Diodato, Letter to Deutsches Museum, 1964, DM VA 0369.

\textsuperscript{71} Deutsches Museum, "Sonstige Ausstellungen (Sonderschauen) 1963-67"; Deutsches Museum, "Verwaltungsbericht über das 68. Geschäftsjahr 1971 und Bericht über die Jahresversammlung 1972," (Munich: Deutsches Museum, 1972). The Israeli-Jewish cooperation of the 1960s and 70s is intriguing, but no conclusion about them is possible at this time.

\textsuperscript{72} Max Grasmann of the Board of Directors asserted at the annual conference that the Deutsches Museum was in fact a representation of the intellectual, cultural, even spiritual labors of Germans (\textit{deutscher Geistesarbeit}) to foreigners, Deutsches Museum, "Verwaltungsbericht 1957-58," 26. Grasmann was a founding member of the CSU (Christian Social Union) party and head of the Bavarian \textit{Landeszentraltbank}; he was also possibly the same Max Grasmann who served as president of the Goethe-Institut from 1962-63.
by recent displays of the “American” moonrock and 5,000 year old artifacts from Israel’s Timna Valley. To Stillger, the introduction of the Danes and their nation of “sophisticated culture” underscored the museum’s intermediary role, “particularly today when the danger of protectionism threatens as never before.” Excellent Danish craftwork – something which Stillger compared to the skill of constructing European missiles! – had to be recognized without respect to any loyalty one might feel towards national industries. In this, the Deutsches Museum proved that it wanted to “learn the speech of others.” While technologies or Kultur might retain their national distinctions, and they apparently did, the museum aimed at a higher understanding of civilization.

Less positive implications for ideals of national technology were more apparent, however, in the Deutsches Museum’s “Day for our Turkish neighbors (Mitbürger).” Many Turkish workers had arrived in West Germany during the full employment of the economic miracle in the 1950s and 60s, when the FRG opened its borders – and even sent buses – to the laborers of countries such as Italy, Greece, and Turkey. Initially, the German economy appreciated their presence and, in 1964, the one-millionth “guest worker” (Gastarbeiter) even received a gift from the state. As the period of economic prosperity lengthened, a good number of workers settled down and made stable lives for themselves and their families, but resentment among native Germans began to grow as

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73 A “House of Encounter” (Haus der Begegnung) was in fact a religious and cultural venue, started as early as the 1950s, to encourage ecumenical dialogue, and the community as a whole. Begegnung after 1945 has the possible connotation of religiously-informed ethical engagement with God and others, as described by the theologian Dietrich Bonhoeffer, executed in 1945 for his association with a failed Hitler assassination attempt.
75 Ibid., 6.
76 Joachim Götz, Die bewegten Zieb Zig: Die siebziger Jahre der Bundesrepublik (Hamburg: Jahn & Ernst Verlag, 2001), 26. Laws that supplemented families with additional funds in order to encourage more children also included guestworkers, Bark and Gress, A History of West Germany, vol. 2, 51.
jobs then became scarce. The presence of guest workers had become a tense fact of daily life by the 1970s and the "Turkish Day" was one in a series of events in Munich that hoped to ameliorate cultural divisions. Celebrations in the Deutsches Museum included Turkish foods, invited visitors to wear traditional costumes and to witness a Turkish dance. The purpose, in the words of pedagogy and public relations head Gottmann, was for all Turkish guest workers and their families to become acquainted with an "essential factor of their new 'elected home' (Wahlheimat) of Western Europe, namely, the history of the natural sciences and technology."  

Yet as department head Gottmann and his staff admirably recognized Turkish immigrants as part of the community, they also made the distinction between them and German citizens clear. On the one hand, personnel wanted their Turkish "guests" to feel at "home" in the Deutsches Museum; the institution's name did not mean that the museum was only for Germans. However, in the same breath, or more precisely, in a speech Gottmann made at the festivities, he lumped them into the separate category of the foreigner:

If I might note: our last analysis showed that 24 percent of our visitors are foreigners and, ladies and gentlemen, that is more than the 22 percent taken up by those from Munich! This visitor day should also offer the first step for what is often a completely different cultural and technical background for our visiting guests — it should awaken understanding for the deep foundations of technology, which they only experience in very limited and specialized segments.

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77 Bark and Gress, A History of West Germany, vol. 2, 372. According to the Statistics Office of the Federal Republic, they were 839,000 Turkish immigrants in Bavaria in 1970, out of 4,692,000 for all the FRG. In Bavaria, Turkish residents were the second largest community among the Land's 4,978,000 foreigners; 990,000 Yugoslavs were the largest, and Italians and Greeks made up the third and fourth (790,000 and 635,000), Statistisches Bundesamt, ed., Statistisches Jahrbuch 1971.


79 Ibid., 2.
Within the well-meaning sentiments lay some murkier assumptions. Without knowing the precise background of those in attendance, it is difficult to know what degree of technological familiarity they possessed or, by 1975, how familiar they were with German culture. Moreover, how the museum came up with the foreign audience statistics is unknown, or what proportion in fact represented the sizable guest worker population. Interestingly enough, yearly accounts dropped the foreigner (*Ausländer*) statistic two years later, at which time the minutes of the annual gathering mentioned the guest worker "problem."80

Though the museum strove to bridge cultural divides, it was also clear that its educators were still talking primarily to a German audience of a certain stripe. As even some German-speaking visitors noted, a genuine effort to cross cultures by the museum could not occur without accessible placards in English, especially striking in light of the large visiting foreign presence.81 Moreover, the economics of the guest worker problem confronted the Deutsches Museum not merely with the complications of national identity in their audience, but also the issue of class, or economic inequality. Indeed, the specter of class conflict had never entirely disappeared from the museum's sights, even in the heyday of the economic miracle. At the annual meeting of 1959, for example, Siegfried Balke addressed fearful matters of "class" when talking about employment and technology, and repeated his assertion of several years prior that technology was in fact an aid to humanity.82

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80 Deutsches Museum, "Jahresbericht 1977."
In the post-1945 era, issues of class included the larger threat of socialist revolution around the globe, which concerned the museum and its advocates. While Balke maintained that the Deutsches Museum was a location where visitors could witness the hope for humanity, fellow council member and president of the German Federal Bank Karl Blessing spoke on the need to address overpopulation, inflation, and the continuing battle between democracy and communism.\(^3\) In these earlier years of economic prosperity, however, optimism about technology and its ultimate social and international implications was easier. For example, according to departing 1960 chairperson Fritz Berg, who was also the first president of the Federal Coalition of German Industry (Bundesverband der Deutschen Industrie) after the war, the Deutsches Museum could be a powerful example for developing industrial countries. Riding the tide of the economic miracle, Berg felt that the ambitions of these fledgling nations would be fulfilled by the application of knowledge, experience, and diligence through, as it had in the West German case, "an amazing accomplishment of the cooperation of many people."\(^4\) West German recovery from thorough destruction, which was helped by the kind of technological education that the Deutsches Museum provided, showed that "every development, also industrial development, begins from below."\(^5\)

It became increasingly difficult to reconcile the technological anxieties of the average German with the interests of the national economy or particular corporations, as


\(^5\) Ibid.
the Gute Form Design Award exhibition showed.86 Starting in 1969, the Economics Minister awarded the prize to a handful of well-designed manufactures like chairs, electronic acoustical devices, televisions, and even drinking glasses. The ministry established overarching themes of selection soon after; 1971 celebrated objects “for the child,” for instance, while 1974 focused on “bicycles and their apparatuses, or environmentally-friendly individual transport.”87 The Deutsches Museum’s 1974 retrospective of winning products addressed, in Stillger’s and Gottmann’s opinion, people’s concerns about technology. For Stillger, the exhibition was an opportunity for reconciliation, specifically between art and science, through the common search for a “humane” or environmentally responsible technology.88 In a local newspaper, Gottmann echoed the argument. Noting that technology museums rarely made the cultural section of the Süddeutsche Zeitung, Gottmann saw the exhibition as a chance to start a dialog between the worlds of science and art, or culture, and realize a “humane environment.” The “good form” was not a superficial facelift, but a reflection of technological responsibility by industry.89

Starting a dialog was moreover part of the very purpose of a museum in a democracy, according to Gottmann, a task that technology museums and the Deutsches Museum in particular embraced. Recognizing that “democratization” was an important issue in current-day conversations, Gottmann believed that scientific and technological museums had much to contribute. He maintained that the history of scientific-

86 An additional example of difficulties of industry and consumption in the museum on the 75th anniversary of the Diesel engine, a special exhibition in 1972 promoted – and promoting a type of product offered – by MAN Industries called “The Diesel Engine is 75 years old – economical and environmentally friendly, now and then,” “Der Diesel-Motor ist 75 Jahre alt,” Darmstädter Echo, 11 November 1972.
technological museums was itself an outworking of democratization: a development from elite curiosity cabinets of the seventeenth century to Valhalla-like national monuments, and then to recent folk museums “in which a daily 10,000 visitors from all age, social, and educational sectors of society is no rarity.” Since technology and democracy were so compatible, then a technology respectful of humane goals was possible. The beauty of design, or good form, could only further these goals for Gottmann, since technology and art were not “antipodes… but rather the common basis of culture and the humane formation of our world-environment.”

Figure 1 – “Exquisite” or “Prized” (Ausgezeichnet)

One of the items in the “Gute Form” exhibit was a Bosch coffee bean grinder (Mahlwerk-Kaffeemühle K1), which according to the one of the captions, “of course [U25]only [stood] as a representative for the many other Bosch household appliances...with Bosch, form and quality go harmoniously hand in hand.” From Süddeutsche Zeitung, 17 July 1974 [U26]

Yet, as some realized, objects of beauty could be quite expensive, and thus, problematic in a society ordered around democratic aims. For example, a writer for the Süddeutsche Zeitung questioned the Minister for Economy, Hans Friderichs, directly about the social implications of the prize. In the interview, Johann Kloecker asked if the

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90 Ibid.
91 Ibid.
selection of certain quality products over others did not inherently invoke class conflict.\textsuperscript{92} A reporter for another paper even saw the prize’s socially responsible categories as suspect since a governmental agency awarding aesthetic prizes to specific industries was questionable.\textsuperscript{93} The streamlined and beautiful utility of the Design Forms represented, finally, a continuity in aesthetic sensibility that harkened back to Nazi sensibilities; the organization “Beauty of Labor” (\textit{Schönheit der Arbeit}) and its style of New Objectivity possessed something of the same ideals and look as they improved working spaces with a view to productivity.\textsuperscript{94} Youths at odds with the system may have been ignorant of this history, but it perhaps explained why some embraced “uncleanliness” and found stodgy bourgeois respectability – which they called the “glamorous gleam of commodity-aesthetics,” “the pressure to achieve hygiene,” and “the mad cleanliness of the bourgeoisie” – objectionable.\textsuperscript{95}

Despite the Deutsches Museum’s contention that technology contributed to social reconciliation, exchanges with Danes and Turks and the exhibition of \textit{Gute Form} reflected the persistence of social tensions that Hitler had once exploited. Danish technology and Turkish guests showed the degree to which culture was national in the Deutsches Museum, and nation was never a completely safe concept after 1945. At the same time, the Deutsches Museum practiced the subtle art of pronouncing harmony, or


\textsuperscript{93} In “The golden glitter of wares: The \textit{National Prize of Good Design} between Social Relations and Aesthetics,” Trappshuh argued that the ministry created the social themes specifically to counter these suspicions, Trappshuh, “Die schöne Schein der Waren.”

\textsuperscript{94} For an example, see Herbert Steinwarz, \textit{Speise durme und Küchen in gewerbllichen Betreiben}, ed. Reichsamt Schönheit der Arbeit, vol. 6 (Berlin: Verlag der Deutschen Arbeitsfront, 1942).

\textsuperscript{95} Slogans of the “K1” commune in 1966 West Berlin were “Glamourglanz der Warenästhetik”; “hygienischen Leistungsdruck” and “Saubereitswahn der Bourgeoisie,” Hermann Glaser, \textit{Kulturgeschichte des Bundesrepublik Deutschland: Zwischen Protest und Anpassung 1968-1989}, 3 vols., vol. 3 (Frankfurt am Main: Fischer Taschenbuch, 1990), 42.
agreement, among those with radically different economic backgrounds when the opposite was the case; Nazi policy had also proclaimed the happy harmony of classes, but to bitter ends. As the fallout from the oil crises showed, social problems had neither evaporated nor lessened by the 1970s. Technology’s relation to job opportunities was all the more contested, if also an accepted fact of life. As the Minister of the Economy and Transportation Anton Jaumann recognized in 1976, many jobs were at risk though he also maintained that “the application of new technology [was] necessary and imperative,” and would ultimately lead to economic prosperity. The Technology-Economy dilemma was one that people hoped the Deutsches Museum might be able to clarify, or at least, the highest point of visitor statistics in its history – past the 1.5 million mark in 1978 – coincided with the burning issue of inflation. However, the likelihood that they received clarification about technology and society was rather dim.

*Atomics, the paradox of cooperative living, and the limits of conversation*

While exhibits like *Gute Form* were problematic, the explosion of visitors to this and other installations undoubtedly revealed an interest in smarter technologies that were well-designed and “friendly” to the environment, and the public’s desire for peaceful dialogue as well. Discussion about technology and the environment was tense, however, and not merely because of internal politics and economics. There was also the larger geopolitical situation; inflation in 1978 coincided with the dissolution of détente and

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debates over the neutron bomb, which brought the nuclear question to the fore once again.  

Nuclear technology involved two distinct, but related, issues in the context of the Cold War – military superiority and economic resources – that were in fact manifested in the “space race.” Among the events that had inaugurated the fearful tenor of East-West relations was the launching of the world’s first man-made satellite, Sputnik, by the USSR in October 1957. There was no denying the Soviets’ accomplishment, as even anticommunists extolled the USSR as a model to follow. The communist entry into outer space began not merely a struggle over space exploration or science. Indeed, it was a battle for military superiority; aeronautics, after all, was just as integral to missile trajectory as it was to piercing the stratosphere. Nuclear projectiles in particular were of concern, given that the Soviet Union had already overcome between 1949 and 1954 whatever atomic edge the United States and NATO allies initially possessed.

Proponents of the Deutsches Museum insisted that the new technologies nevertheless gave reasons for optimism, as seen in the museum itself. Addressing the museum’s 1959 annual assembly in the dual capacity of museum chairperson and Minister of Atomic Energy, Balke recognized the anxieties and confessed himself astounded at the increasing attraction, per statistics, of the museum at a time when the “technology had doubtless contributed to increased fear in the world.” Yet he maintained that technology was also responsible for hope, as in the unforeseen progress in living

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standards. This, to Balke, explained the beloved status of the museum, and he waxed eloquent on the poetic beauty of technology, whose continued development reflected responsible economic and political behavior.\textsuperscript{102} Echoing these sentiments was the physicist Werner Heisenberg, who concluded, as he reflected upon the amazing transformations in technology of the twentieth century, that what ultimately made the museum special was its focus on human effort. It was a little ironic that the physicist famous for his principle of uncertainty, and also a key figure in the development of a nuclear bomb program under Hitler, spoke on this topic at the Deutsches Museum in 1964.\textsuperscript{103}

According to Heisenberg, who was also a chairperson of the Deutsches Museum, benefits like increased wages or more holidays were not the magic of advanced technologies in the museum, but the creative and cooperative work of many individuals. Space age technology did not so much represent an increased threat to Heisenberg as make the problems and benefits of all technological achievements clear. He noted that from ten kilometers above, the world may seem like a beautiful – and unified – globe, but the view from outer space also presented the literal limitations. The earth was now

\textsuperscript{102} "In the Deutsches Museum," sung Balke, science and technology became "the helper of mankind... like art, music and poetry [but] in object form." Within this "kingdom of the senses, unconscious, irrational," Balke located the "secret" of the Deutsches Museum's pull on all classes of society: its extraordinarily clear installations of human intellect, diligence and creative desire engaged its viewers through active button-pushing and had tapped into something elementally powerful, like fire, water, earth and air. The poetry makes sense when you consider the immense power of atomic energy, something that moved even Oppenheimer on the occasion of the first atomic bomb's detonation to quote the Bhaghvad Gita. Balke continued, to "rejoice - above all we Techniker - that we have such an institution in which the most beloved, if also not undangerous manifested form of homo sapiens, the homo ludens [man as one who plays], has a warrant to exist, Siegfried Balke, "Das Geheimnis der Wirkung des Deutschen Museums: Bundesatominminister auf der Ausschussitzung des Deutschen Museums," Press Release, 6 May 1959.

\textsuperscript{103} The Deutsches Museum had exhibitions on the topic as early as 1962, Deutsches Museum, "Verwaltungsbericht 1962." Heisenberg (1901-1976), winner of the Nobel Prize in Physics 1932 and famous for his Uncertainty Principle. For more on his affirming the culture of the West, see Werner Heisenberg, Atoms with Hooks and Eyes: Thoughts on Humanistic Education, Science, and Western Culture, trans. Richard and Clara Winston, Qualität ist das... (1957).
“completely different from before, a … [rather small] living space in which we must settle into and fashion life together.”

Though resource scarcity would require intense work to create a harmonious communal life, Heisenberg believed it possible, and hoped that “Germans would not come off too badly” in the effort.

However, resource was in fact a long, complicated issue for Germany. Germany suffered, according to a view dating from the nineteenth century, from a severe lack of resources in comparison to other countries. In fact, education was seen as one of the nation’s few strengths, because it provided the basis for a culture-rich and “resourceful” society against resource-poor conditions. Hitler’s fantasies about the needs for greater Lebensraum, or living space, played into this German obsession with resources, which served as justification for annexation, and eventually war. In the Nazi period, technology was a key factor in addressing scarcity; the chemical and pharmaceutical conglomerate I.G. Farben created synthetic fuels, rubbers, and plastics in order to ensure a self-sufficient National Socialist economy. In light of the reductions in territory after 1945, many West Germans in industry and technology believed that only technological innovation could continue to compensate for the absence of resources. Nuclear technology, specifically atomic power, was regarded as an important way of successfully resolving the problems. At the same time, as Stillger’s introduction of Danish wares

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105 Ibid.
106 The insight comes from Ringer, I believe.
107 For more on the politics of autarky, see for example Ian Kershaw, The Nazi Dictatorship: Problems and Perspectives of Interpretation, 2nd ed. (London and New York: Edward Arnold, 1989), especially chapter 6 on ‘Nazi Foreign Policy: Hitler’s ‘Programme’ or ‘Expansion without Object?’.”
109 Weber and Engelskirchen, Streit um die Technikgeschichte, 145.
indicated, postwar policy makers avoided the former autarkic dreams of splendid isolation, and it was at least acknowledged after the war that technology did not always lead to peace.

All the concerns related to economy, possible war, and nuclear technology were

Figures 2 and 3 – Fear all around: exhibition planning for "Man and the Environment"
The clipping of the “Angst” article on environmental dangers in the Deutsches Museum archive focused on four topics, from left to right: air pollution (Luftverschmutzung), water pollution (Wasserverschmutzung), noise (Lärm), and pesticides (Schädlingsbekämpfung). The Deutsches Museum planners seemed to have well anticipated their audience’s concerns; two years prior, all factors figured into the planning of the “Mensch und Umwelt” exhibit two year prior, as seen in the core conceptual sketch above; the four dark arrows from left to right list the elements of air, water, noise, and refuse. From "Angst vor Umweltgefahren," Gesichertes Leben (1972) and Zeichnung Scholze/Tratz, "Plans for the Mensch und Umwelt exhibit," 1970, Deutsches Museum VA 2274.
captured in the idea of a sustainable environment during the 1970s. In this decade, “fear” became more of a byword in contrast to the optimism of previous years.\(^{110}\) The prospects of human self-annihilation facilitated even a conservative intellectual shift that had roots in the 1940s and 1950s, but expanded to a larger public in the 1970s and 1980s. From this perspective, cultural institutions were necessary constructions that protected humanity from the elements of nature, and thus in turn needed to be protected.\(^{111}\) In the Deutsches Museum, 1970 designs for a future exhibition of “Humans and the Environment” (*Mensch und Umwelt*) illustrated the depth to which people felt surrounded by and connected with the environment – for good or ill.\(^{112}\) Among the topics that troubled Germans in a 1972 poll were air and water pollution, increased levels of noise,

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\(^{110}\) If the buzzword of Willy Brandt was “democratization,” authors Bark and Gress found the Schmidt-Genscher era to be one of “*Angst*” (fear), Bark and Gress, *A History of West Germany*, vol. 2, 274.


\(^{112}\) Scholze/Tratz, "Plans for the Mensch und Umwelt exhibit."
and the use of pesticides.\textsuperscript{113} In response, the Deutsches Museum focused on issues such as “Water” or “Environmentally-friendly Transportation Systems of the Future,” the title of two exhibitions.\textsuperscript{114}

However, when it came to matters of atomic energy and the question of a sustainable environment, detached distance for the Deutsches Museum was in fact impossible. For instance, the Deutsches Museum had a special exhibition as early as 1956 entitled “Atomic Power for Peace,” echoing US President Dwight Eisenhower’s famous “Atoms for Peace” speech to the United Nations three years prior.\textsuperscript{115} Besides the presence of someone of Heisenberg’s stature, speakers like German Atomic Forum founder Karl Winnacker honored the Deutsches Museum stage. More generally, an inordinate number of the Deutsches Museum administrators themselves were involved intimately with the subject of physics. Jonathan Zenneck, the first director the museum after the war, was a physicist, and one of his successors was in fact the Federal Minister of Atomic Power Siegfried Balke. It was perhaps unsurprising that the physics department overall, which had included musical, optical, and atomic instruments, was the most extensive by the 1970s.\textsuperscript{116}

Paradoxically, the atomic exhibition in the Deutsches Museum had continual problems of funding and direction. A temporary five-year installation began in the 1960s, and was supposed to lead to a permanent exhibition on nuclear technology. However, the scope of the project ran into problems between the late 1960s and the early

\textsuperscript{113} "Angst vor Umweltgefahren," Gesichertes Leben (1972).
\textsuperscript{116} Alto Brachner, Günther Gottmann, Bert Heinrich et al., Deutsches Museum München (Munich: Westermann, 1979), 60.
Chapter 1

1970s. With staff and resources that were already stretched, no one in the physics section wanted ultimate responsibility for the nuclear project. Gottmann and Alto Brachner, who oversaw the physics department, were therefore frustrated in their attempts to shape the exhibition into more than a showcase for atomic technology. The absence of a specialist for the exhibition was troubling because it went to the heart of the museum’s task: an ability to come up with something other than just an industry plug in the third most “beloved,” or popular department of the 1970s.¹¹⁷ A number of personnel recognized that the emergence of other exhibitions about atomic energy around the country, such as the presentations at the newly established Grohnde nuclear reactor, implicitly questioned the ability of the museum to keep pace.

Displays of nuclear technology showed the difficult problem of maintaining the museum’s commitment to the story of human achievement on the one hand, and attempting to address the threats that new technologies posed to humans on the other.¹¹⁸ Without a doubt, the many departments of the Deutsches Museum meant that there was a

¹¹⁷ Physics ranked behind mining and the automobile/railroad transportation departments, Brachner et al., Deutsches Museum Munchen, 60.
¹¹⁸ One example showed the dilemma in the extreme: the Deutsches Museum obtained radioactive compounds of historical value and stored them in a bunker because they were considered masterpieces of technological history. However, due to the fact that they were still radioactive – with activity between one to two curies – and that it was also impossible to secure the bunker completely (in the case of a flood, for example), museum administrators eventually ordered the removal and destruction of the compounds. Before it was all said and done, however, communications went back and forth internally and externally with government agencies on what a “safe” level of radiation for visitors meant, and whether the museum was beholden to the same standards of industry for radioactivity, Deutsches Museum, DM VA 1565-1568. Standards of measurement was and continue to be an issue in the United States as well, although most agree now with health physicist Karl Z. Morgan, who has worked since 1945 on the premise that there is “no safe level of exposure.” For Morgan’s own memories of testing radiation on subjects, and the pressure that Cold War politics played in the evaluation of atomics, see US Department of Energy, “Human Radiation Studies, Remembering the Early Years: Oral History of Health Physicist Karl Z. Morgan [conducted January 7, 1995].” Department of Energy Openness: Human Radiation Experiments, http://www.eh.doe.gov/ohre/roadmap/histories/0475/0475a.html (accessed 31 January 2006). See, for example, “Radiation, how much is considered safe for humans?” MIT News Office, http://web.mit.edu/newsoffice/1994/safe-0105.html (accessed 23 January 2006); Environmental Protection Agency [U.S.], "Understanding Radiation: Health Effects," http://www.epa.gov/radiation/understand/health_effects.htm (accessed 23 January 2006).
constant tussle over funds and resources. However, without balanced and pedagogical exposition, the persistence of nuclear displays in the museum was problematic. They showed that administrators felt the issues surrounding nuclear technology were relatively straightforward, or were prepared to present them as such. In the end, a completely new department was formed in 1977 around atomic energy and physics, 90 percent of which was supported by industry funds. The substantial external support meant that the museum gave up, in effect, critical control over the presentation of a controversial topic. In fact, the museum had to open a new "Energy" department several years later partly to counter the charge that its focus on atomic power neglected other energy technologies.

The problem of a democratic dialogue with the viewer and the Deutsches Museum's role as a technological authority was no more trenchant than in this area. Since World War II, doubt about technocrats and the issue of technological control existed among a number of citizens, if letters to the Deutsches Museum were any indication. Most viewers were also long aware of the complications around nuclear technology. Early efforts of the 1950s to found a nuclear reactor in Munich — under

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120 Deutsches Museum, "Jahresbericht 1983," (Munich: Deutsches Museum, 1983), 18. According to the yearly minutes, the Deutsches Museum's department would show the "manifold relationship and dependencies among energy technics, the economy and energy resources."
121 What the majority of visitors thought about technological control is impossible to determine. However, the museum did receive suggestions from its audience on this point that ranged from the eccentric (though sometimes on target, like the suggestion for an exhibition on the failures of experts, or "famous errors in science") to the very thoughtful. One visitor's letter quite elegantly considered transformations in the post-1945 world, and the need for the Deutsches Museum to come up with a new relationship to the viewer, given the increasing accumulation of knowledge and the tension among world powers. However, this did not mean that the public would readily believe what scientists told them about reality, at least according to one popular newspaper columnist's forceful doubts, see Fischer, Letter to Deutsches Museum, 20 February 1958, DM VA 0367; Dunkel, Letter to Deutsches Museum, 1964, DM VA 0369; Kurt Franz, "Humanismus und Technik," Suddeutsche Zeitung, 25 November 1976.
Professor Heisenberg – ran aground in the face of local objections.\textsuperscript{122} By the 1970s, the “Green Movement” of grassroots political activism began among disparate sectors of society that catalyzed around environmental issues.\textsuperscript{123} Regarding the issue of nuclear technology in particular, 28,000 citizens made their opposing sentiments known at the proposed power plant of Wyhl in southwest Baden-Wuerttemberg. A number of them also occupied the site for nine months, which eventually led to the cancellation of the project in 1977.\textsuperscript{124} Wyhl prompted similarly impassioned protests around the country, though public opinion frowned on violence at the Grohnde plant in 1977.\textsuperscript{125} Political organization emerged at the local and regional level as well, which was instrumental in the formation of the Green Party in March 1979, just in time for the first European Parliament elections in June.\textsuperscript{126}

The growing anxiety about nuclear power was clear, but the Deutsches Museum remained either very quiet, or quietly contrary to the mood.\textsuperscript{127} Despite the avowals of discussion, there were limits to conversation that not only echoed attitudes about technological education prior to the war, but also concomitant conservative currents. In \textit{Man: His Nature and Place in the World}, a work first published under the Nazis, the sociologist Arnold Gehlen defended the conservative role of cultural institutions because

\textsuperscript{123} Bark and Gress, \textit{A History of West Germany}, vol. 2, 341.
\textsuperscript{124} Carol Hager, "Citizen Movements and Technological Policymaking in Germany," \textit{Annals of the American Academy of Political and Social Science} 528 (1993): 50.
\textsuperscript{125} Ibid.
\textsuperscript{126} Bark and Gress, \textit{A History of West Germany}, vol. 2, 341-42.
\textsuperscript{127} For example: museums in Prague as well as the East German Institut für Denkmalpflege (Monument Maintenance) in Dresden asked the Deutsches Museum in 1958 to declare an anti-nuclear stance (though the positions of their own states were rather suspect). Whatever reply the administration offered to these letters, perhaps the following can be taken as representative: the museum made a radioactive dust monitor publicly available, Institut für Denkmalpflege Dresden, Letter to Deutsches Museum, 29 March 1958, DM VA 0367; Prague Museums, Letter to Deutsches Museum, Mai 1958, DM VA 0367. Deutsches Museum, "Luftmonitor in Deutschen Museum," Press Release, 3 December 1958, DM VA 3942.
they were structures of stability, or shelters, on a planet already hostile to humans. Trust in larger institutions afforded citizens an opportunity like, as he later put it in 1965, "the child hiding behind its mother's skirts [who] experiences both fear and the minimum or optimum of security that the situation allows." Yet the question remained of how safe a culture founded upon nuclear energy could in fact be. In the end, the example of nuclear technology showed that cultural discussion and objectivity, or leaving the final point "with the object itself" as Stillger suggested, was less straightforward than the Deutsches Museum had anticipated.

Shaping engaged, acculturated, and responsible children

The potential, and the problems, of creating a culture of technology for democracy became most clear when the museum tried to articulate the meaning of technological responsibility for children. Actually, the museum's relationship to youth contained a latent contradiction between the democracy that the museum espoused and its conservative embrace of Kultur. The early association of technology with the higher circles of culture and Bildung had survived enough that, even on a superficial level, dissonance existed between the refined image of technology that the museum offered and the mere presence of children. However, the desire for children made a certain level of indecorous commotion within museum halls acceptable. No wonder that other museum patrons, who were more interested in the dignified version of the Deutsches Museum, complained.129

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129 One visitor wrote to complain of children who were "too uncontrolled," Brüning, Letter to Deutsches Museum, 28 August 1953, DM VA 0369. Also E. Glass, Letter to Deutsches Museum, 26 August 1959, DM VA 0367.
Indeed, the museum wanted children, lots of them, and moreover wanted them to be positive about technology. Throughout the Cold War period – from 1955 all the way into the 1980s – technological and educational elites fretted recurrently about the threat of youth’s diminishing interest in technology.\textsuperscript{130} This was the case despite the fact that visitor statistics, including those for students, were at all-time highs. When educators did manage to acknowledge the high numbers and attendance, however, they then lamented youth’s pessimism about technology, as if their curiosity could only be negative.\textsuperscript{131} In any case, the search for youth led museum educators to seek new exhibition styles in order to encourage the presence of children in the Deutsches Museum.

The “Technology is fun!” (Technik macht Spass) exhibit was, on the surface, the most innocuous of exhibitions. In fact, the exhibit exemplified a pedagogical trend that would increasingly strain the Deutsches Museum’s efforts to fulfill its educational mission. From November 1972 to July 1974, Technik macht Spass demonstrated scientific principles – like the effect of gravity – to children through Tinkertoy-like objects.\textsuperscript{132} The museum created the exhibition in association with Fischer Toys, and used the company’s sets as the focus of the displays. Exhibition organizers also borrowed


\textsuperscript{131} Deutsches Museum, "Jahresbericht 1980."

additional objects from corporations like Allgemeine Elektrizitätsgesellschaft (AEG), the electrical giant of Germany. It was a first for the museum, which had never before built a purely pedagogical exhibition. In developing the show, the education and public relations department even worked in conjunction with the Specialized College for Social Pedagogy (Fachhochschule für Sozialpädagogik). The exhibit was spectacularly successful; it extended over 21 months, drew over 1.2 million visitors, and eventually traveled to Vienna, Berlin, London, Haifa, and Paris.

According to Günther Gottmann, the exhibition was about much more than the demonstration of scientific principles through technical toys. For one thing, the exhibit encouraged the moral development of children by underscoring the relationship among technology, human possibility, and responsibility. For Gottmann, inculcating responsibility for technology was important, and the exhibition aided this goal by showing that humans actively created both culture and technology. They were not, in other words, “developments” (Entwicklungen); Gottmann scornfully addressed what he considered to be fadish histories that emphasized contingency rather than humanity’s control. Without a proper understanding of human possibility and agency, Gottmann could not imagine how to have a responsible attitude towards the future. Only in this way could the museum address the equality question, for example, by recognizing that technology education was usually aimed at boys. Organizers were proud of the fact that the exhibition showed that technical toys “also belonged in a girl’s room.

(Mädchenzimmer)”; in fact, they trumpeted the results of an educational worksheet accompanying the exhibition in which more girls than boys answered correctly (48 compared to 38 percent). Just as importantly, however, Gottmann’s philosophy served as an indictment of the Nazi past; emphasizing responsibility and human control over events directly refuted any conclusion that Auschwitz was inevitable.

Furthermore, Gottmann maintained that Technik macht Spass showed the importance of technology for humanity. In his speech for the exhibition’s Vienna opening, Gottmann said that the Deutsches Museum and other scientific educators had to show “not only how technology works, but also what technology means – [we must] not only show the machine but also its products.” The “products” were actually both tangible and intangible, since they included the entire present-day world and its culture. By elucidating technology’s role in the creation of modern life and especially culture, the museum showed the meaning of technology, or what Gottmann called its “cultural-historical” (kulturhistorische) contributions. Ultimately, the exhibition’s focus upon the positive aspects of technology was a way to respond to, if not redirect, the criticisms of technology in the aftermath of World War II.

However, the assumed lack of interest in technology on the part of children was at the crux of the deeper contradiction in the Deutsches Museum’s educational vision. One of the most trenchant criticisms of technological expansion was environmental impact. The Oil Crisis of 1973, the ecological effects of energy technologies, the politics of Mutual Assured Destruction, and the promotion of atomic energy were all issues with

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138 Ibid., 7.
socially complex consequences that loomed large in public discussion. While museum professionals did not refute the validity of these arguments, they nonetheless attributed the mood of technological pessimism mostly to public *perceptions* of misuse or unintended effects of technology. In the attempt to shift these assessments, exhibitions like "Technology is fun!" pointed out instead the upside of technological expansion or political policies that encouraged growth. Neither the educators nor the scientists, however, had solutions that fully addressed the social and environmental entanglements of technology.

The museum furthermore implied that a proper understanding of science and technology on the part of youth would eventually produce environmentally sound practices and machines. That, at least, was the argument in one of many museum events that encouraged youths to engage with technology: the hosting of the third annual Bavarian competition "Youths can research, too (Jugend forscht)" in 1973. The Deutsches Museum often departed from its normal focus on technological masterpieces when it came to youths, but director Stillger nonetheless saw three similarities between the mission of the Deutsches Museum and this particular competition. First, they both aimed at active learning or participation in science. Second, they measured their success in terms of what he called an "authenticism" regarding science (a "pure" science) instead of one that pushed "consumer-oriented," or what he considered cosmetic, objectives. Finally, they both wanted to encourage understanding of past and present circumstances in order to direct future efforts, such as controlling the effects of technology upon the environment.139 Thus, Stillger provided the motivation for greater participation in

science on the part of children by implying that the more youths involved in an “authentic” science, the better protected the environment would be.

As Stillger also implied, the benefits of technology were not merely material but personal; the Deutsches Museum was interested in shaping the character of their visitors, especially children, whether fostering an ethic of responsibility towards the environment or encouraging self-discovery. In an international competition of children’s artwork and technology in 1975 (“Technology Through the Eyes of Youth”), Stillger noted both the fanciful and threatening views of technology within the drawings and photographs. Whether positive or negative, the artwork was an important way to help children engage with technology, and even understand their own potential. A person who actively worked out these issues, Stillger contended, “perhaps finds one’s life’s task – one becomes a “technician” (Techniker); painting was thus “a way to a discovery of self (Ichfindung), or towards finding a vocation.”\(^{140}\) By helping children to recognize the technical aspects of their own personality or being, and facilitating their search for personal purpose, Stillger maintained that the Deutsches Museum held a “somewhat pathetic” hope: that it played a part in educating children who, one day, were able to control technologies and shape the future.\(^{141}\) Lest his comment indicate otherwise, it was not that the museum suffered from any perceived lack of interest on the part of children, for Stillger mentioned that over 750,000 youths visited the museum in the past year.\(^{142}\)

As upright as the hopes for each child’s individual development in the Deutsches Museum sounded, both the ethic of responsibility and search for vocation were also laced

\(^{140}\) Theo Stillger, “Jugend sieht Technik,” 7 August 1975, DM VA 0910. There is a latent reference to Martin Heidegger’s *Being and Time* and his mediation on the relationship between tools and human existence.

\(^{141}\) Ibid.

\(^{142}\) Ibid.
with national economic concerns. Until the Wall stopped the East-West migration in
1961, it was the GDR – which produced twice as many engineers – that supplied the FRG
with most of its technical expertise.\textsuperscript{143} Only afterwards did educators and others begin to
take more notice of technological education. In 1969, West German educator Willi
Voelmy maintained that at a minimum, “FRG educators should accept that polytechnics
in East Germany have presently reached a level that represents a distant goal envisioned
by West German educators.”\textsuperscript{144} According to Voelmy in his \textit{Polytechnical education in
the Ten-Year Polytechnical School of the GDR since 1964}, East German children were
quite ahead of their Western contemporaries, especially in areas of creative initiative and
independence. By 1970, many West Germans came to this conclusion as well; according
a poll by the newsweekly \textit{Der Spiegel}, 35 percent of those asked felt that the GDR had
the “better” educational system, while 24 percent elected the FRG (34 percent saw them
as equals).\textsuperscript{145}

In this context, the effort to make technology fun was part of the attempt to
integrate technological education into the general curriculum for possible future
economic effect. Elementary and secondary schools in Munich, at least, introduced a
new topic of education at the onset of the 1970s called “Technical Works” (\textit{Technischen
Werken}), which was supposed to expose students to everything from a postal scale to
complicated electronic switches. Working with the city of Munich, the Deutsches
Museum constructed a course for instructors of “Technical Works,” with a view to the
most modern curricular innovations. The “Technology is Fun!” exhibition, according to
the public relations department of the museum, was an important contribution in the type

\textsuperscript{143} Bark and Gress, \textit{A History of West Germany}, vol. 1, 393.
\textsuperscript{144} As quoted in Rodden, \textit{Repainting the Little Red Schoolhouse}, 413-14.
\textsuperscript{145} As cited in Rodden, \textit{Repainting the Little Red Schoolhouse}, 413-14.
of education that it hoped to foster. Deutsches Museum educators hoped that the exhibition, and the classes in schools, would help young visitors work "intensively" with technical problems.

Reconciling technology to youth, then, had a utilitarian dimension that at times rendered the museum into an instrument of the economy and industry. In fact, in order to further encourage the engagement of young persons with technology, the Deutsches Museum founded the Career Information Center (Berufsinformationzentrum, BlZ) in 1974. A resource for the population at large, the center hoped to combat the anti-technology feeling that Deutsches Museum educators attributed to younger perceptions of technology's effect upon the environment. However, the main goal was entirely practical: it hoped to stem an anticipated "crisis" of fewer future technology workers.

Corporate sponsors of the museum also saw the useful potential, and their contributions can only have made any critical perspective on the part of the Deutsches Museum more difficult. For example, the Association of Mineral Oil Businesses (Mineralölwirtschaftsverband e.V.) responded positively to the Deutsches Museum's request to become a supporting member. Some of the organization's reasons for support included the newly opened exhibition on natural oil and gas, but also and more importantly, the sizable number of young student visitors and the museum's optimistic views on technology as well.

Despite the fact that educators and politicians in the 1970s straightforwardly addressed children's engagement with technology, this did not rid exhibits like

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“Technology is fun!” of their complicated economic or political implications. By associating science with toys – as if learning the principles that governed the world were only a matter of greater or lesser entertainment – the exhibition made science and technology less threatening, but obscured the politics. Though there was much talk of responsibility on the individual level, the museum did not indicate, for example, who was responsible for the larger economic and political problems stemming from technology, or address the degree to which technology was simply uncontrollable. Also, using corporate sponsorship and products like AEG or Fischer toys within its exhibition obfuscated social critiques of commodities like toys, while only industry’s positive side came through. The overall positive attitude towards technology, the conviction that technology was more or less true to desires of its handler, and the reinforced connections among technology, responsible youths, and a strong state all shared fundamental similarities with positions that the Deutsches Museum held from before 1945, though now they were held in the name of democracy.

The message about flight and German history

The politics of responsibility and technological culture came together with those of national agency in the exhibition of flight technologies. Flight, on either side of the stratosphere, had invariably involved national interests. In 1969, the year of the first lunar landing, the Deutsches Museum opened an exhibition on “Man and Outer Space” with another speech by Siegfried Balke. On the one hand, Balke made sure to point out the benefits of space research to humanity and the Deutsches Museum’s crucial service in representing them. The Deutsches Museum was among the “Sites of Encounter (Begegnung),” he said, in which “human imagination about the meaning and limits of
technology [was] represented objectively ... and the human factor proven to be indispensable.”\textsuperscript{149} However, if space technology was part of the larger dream of grasping the universe, Balke also noted its economic, not to mention military, aspects as well. The natural laws of the world and civilization manifested in space technology were important to understand, but more important to Balke was that Germany and Europe were “behind” the US and USSR in the field.\textsuperscript{150} There was, in Balke’s estimation, a technological gap in space research that Europe, and specifically Germany, needed to overcome. He thus justified the one billion mark allocation by the Federal Ministry of Scientific Research in 1962, and any expenditures that followed.

When hostilities heightened between the US and USSR a decade later, flight became once again a national issue. Indeed, the topic of flight in this “nation of fliers” consistently found a receptive audience, but it also unavoidably involved military issues; rapid developments in air flight themselves came from the desire for tactical advantage during World War I.\textsuperscript{151} After the second world war, as controversy raged over Germany’s possible rearmament, airplane construction was a particular point of contention. Between 1963 and 1973, malfunctions of the US Lockheed-designed, but German-made, F-104G Starfighter were responsible for 157 crashes in which 50 percent of the pilots died. This eventually prompted the resignation of military chiefs, but not the

\textsuperscript{150} Ibid.
\textsuperscript{151} Peter Fritzsche, A Nation of Fliers: German Aviation and the Popular Imagination, Reprint ed. (Cambridge, MA: Harvard University Press, 1994). Although economics also prompted many to wonder whether the battle over space superiority was necessary, at least during détente. Already in 1972, a mere three years after the historic achievement of Apollo 11, some Munich residents were already nonchalant about the moon landings. In the words of one woman, “today the sense of adventure doesn’t exist any longer... basically, a couple of men, well protected by technicians, are scampering around the moon and there isn’t any more to it,” “75 Milliarden Mark - War es das Wert? Das Ende der Amerikanischen MondÄra,” Welt am Sonntag, 10 December 1972.
halting of Starfighter construction until the government finally contracted a French-manufactured design.\textsuperscript{152} In the 1980s, however, missile aerodynamics rather than airplane flight was the critical issue of military aeronautical politics after US President Jimmy Carter withdrew from SALT II limitation talks in response to the 1979 Soviet invasion of Afghanistan. Thereafter, intermediate-range nuclear weapons on European soil and US President Ronald Reagan’s Strategic Defense Initiative (SDI, or “Star Wars’”), which proposed nuclear tactical protection from the heavens, headed the agenda.\textsuperscript{153}

The 1984 opening of the Hall for Air and Space Flight in the Deutsches Museum reflected the continued importance, and positive role, of flight in Germany. It was clear from the beginning that the museum was going to display air and space technologies in a celebratory light. Founded six years prior, the Hall became the largest construction project of the museum’s history, which the Deutsches Museum observed with much fanfare at the opening ceremonies.\textsuperscript{154} Political figures from the national scene not only attended, but delivered speeches against a backdrop of airplanes and satellites. Though the mood was festive, speakers were not unaware of criticisms regarding the aeronautic technology on show, much of which had undoubtedly been developed with military needs in mind. Yet when the politicians addressed these criticisms, they argued that flight technology was crucial to the promotion of nation and democracy. The inaugural talks together sent a clear message regarding the place of technology and the German nation.

Opening the ceremonies, Bavarian Minister-President Franz Josef Strauss rejected the ambiguities of technological power. Nonetheless, Strauss exemplified the

\textsuperscript{152} Bark and Gress, \textit{A History of West Germany}, vol. 2, 51-52.
\textsuperscript{153} Ibid.
\textsuperscript{154} Füßl, ed., \textit{Geschichte des Deutschen Museums}. For later expansions, see Conclusion.
problem of technology and politics, and not only in his very presence as the former Defense Minister who fell from national grace in a scandal over military defense secrets. Strauss first addressed a recent article that criticized the technological enthusiasm of the museum. He, in contrast, was convinced that the overwhelming majority of visitors to the Deutsches Museum would understand that the technological masterpieces were “evidence that, with the free, creative, and productive achievements of our progressive politics, we [Germans were] on the right path.” Those who saw technological objects in themselves as deserving of exorcism, Strauss considered as mistaken. Though advances of technology had indeed changed the environment, Strauss stressed that “machines need not make men slaves, but men must remain masters of machines.” “This,” Strauss said “we all agree with,” and further enlisted the recent Papal Easter address as evidence of common agreement. The connection between the loss of belief in human mastery over its affairs and dwindling faith in both God and technology was evident for him.

Strauss argued furthermore that agency, democracy, Germany, and culture were connected. Alongside the critical article, Strauss serendipitously encountered the thoughts of historian Michael Stürmer, who was also in Munich attending a symposium on “Culture and Politics.” Stürmer’s words, which Strauss felt were worth quoting, expressed perfectly what was at stake:

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155 Strauss served under Chancellor Konrad Adenauer. “The Spiegel Affair” was a series of confrontations between the magazine Der Spiegel, which came to a head when one of its reporters averred that the German Army was not prepared for a Soviet nuclear attack, and a rift between Strauss and the US as well. Because the reporter, Conrad Ahlers, would not reveal his source, Strauss ordered arrests and a search of the magazine’s offices, which the public considered an outrageous exercise of state power. The affair led to the downfall of Adenauer’s government, Bark and Gress, A History of West Germany, vol. 1.


157 Ibid.

159 Ibid.
Chapter 1

We have nothing but the power of our intellect. We will either survive as a world economic powerhouse (Werkstatt der Welt) and as a Kulturation, or we will not survive at all. A third option is not available, or rather, only in the form of a large, poor, and constrained administration that would postpone the [inevitable] battle of all against all, but free democracy would then be a long distant memory.\(^{159}\)

Stürmer’s, and Strauss’s, casting down of the third option, much like the “third way” of political speak that sought to wed capitalism and socialist morals, only underscored the point. In Strauss’s view, technology, democracy and survival were necessarily joined together.

The ties among technology, control, and Germany’s future were apparent not only to Strauss, but also to another speaker of the day, Chancellor Helmut Kohl.\(^ {160}\) Kohl began with a humorous reference to West Germany’s political climate: “in the FRG, it has become the norm that someone demonstrates against something.”\(^ {161}\) However, Kohl then offered what he considered to be the productive alternative to political protest: one could instead “demonstrate for the grand technical history and traditions of our people (Volk).”\(^ {162}\) The task of appreciating the many contributions of Germans to world history was one that the Deutsches Museum did well. Praising the museum, Kohl said, “we [Germans] can only understand our culture, or the cultural landscape in which we live, and we can only shape our future if we live with our history, which includes the history of our technology, and if we know its development.”\(^ {163}\) If Germans had to understand their history, or embrace a national identity, in order to move successfully into the future, Kohl

\(^{159}\) From the Frankfurter Allgemeine Zeitung (11 April 1984), as quoted in Ibid., 14.

\(^{160}\) Helmut Kohl (1930-), was chancellor of West Germany, then unified Germany, between 1982-1998. He also headed the Christian Democratic Union party between 1973-1998.

\(^{161}\) Deutsches Museum, “Jahresbericht 1984.”

\(^{162}\) Ibid.

\(^{163}\) Ibid., 15 (emphasis added).
made not an uncontroversial demand. Calls for a national history and identity meant also coming to some kind of acceptance, or perhaps forgetting, of the country’s Nazi past.

Kohl combined the need for a strong national identity with the country’s Cold War position, which demanded an optimistic view of control over technology as well. The development of West German space and air technology was, in Kohl’s words, a game that the FRG needed to win, and recent German-European work on both the Ariane rocket and Spacelab seemed encouraging. In light of these developments, Kohl told museum personnel that they should not worry about any criticism of their work, because what the Deutsches Museum fostered was the crucial ability to control technology. Technology was something like unbridled nature, not something in which to “believe,” but to understand “in order to use it and remain its master.” \(^{164}\) Though the jump between West German advantage and human control may have seemed a little obscure, it was in fact critical. Indeed, without the faith that scientists and politicians could successfully direct technology towards desired ends, victory in the Cold War would be impossible.

Concluding the speeches, Deutsches Museum director Otto Mayr also stressed the connection between freedom and control of technology, but with somewhat less optimism. Mayr asserted the museum’s positive position on space technology, but he also conveyed, through sheer emphasis and repetition, the precarious nature of agency and democracy. On the one hand, he argued that it was crucial to show that technology was subject to the free decisions of humans, whether of the rational individual or of a democratic majority. When a person knew that “he [could] master technology, that technology [was] his handmaiden, he [would] not fear technology, but with calm and

\(^{164}\) Ibid., 16.
without overestimation, use it for himself.”¹⁶⁵ Yet by stressing the necessity for calm, a much-needed disposition in a climate of “mutual assured destruction,” Mayr also implicitly acknowledged the likelihood of the absence of control. This was a conclusion, however, that he did not aim to convey.

Alongside these pleas for agency, democracy, and national confidence were growing issues of national history in the 1980s.¹⁶⁶ Not two years from the Hall’s opening, a famed intellectual debate on the topic of history, Holocaust, and German nationhood occurred that reverberated beyond West German borders. In 1986, the “battle among historians” (though the sociologist Jürgen Habermas initiated it), or Historikerstreit, debated whether the soldier on the Eastern front in World War II, for example, could be counted as defenders of their homeland.¹⁶⁷ “Objectively” separating the soldier from exterminators of Auschwitz might, according to the argument, provide an untainted German figure, and thus, history.¹⁶⁸ A major figure in these debates was the historical advisor to Chancellor Kohl and historian Stürmer, who talked about the “guilt obsession” of Germans. He and others tapped into a broadly felt need to talk, at least, about the meaning of “West Germanness,” if not also to locate some clean source for national identity or pride out of which to engage confidently in world relations.¹⁶⁹

¹⁶⁵ Ibid., 17.
However, these concerns also reflected the desire to operate in the international realms of economics and politics without being at any perceived disadvantage.\textsuperscript{170}

Thus, the museum’s messages about flight technology and a culturally democratic nation in 1984 anticipated problems that the later historical discussion crystallized. The incongruity between the museum’s proposals for discussion and the presence of Strauss, a man synonymous with abusing the freedom of the press, was the least of the issues. Tying technology with a national and democratic identity was a cultural argument that had powerful implications. This was because the message of the museum’s educators and its proponents was, above all, one of control. Enthusiasts asserted that humans were capable of controlling technology, directing it towards democracy, and remaining its master whether it was a matter of flight or nuclear physics. Yet did not the history to which the technological enthusiasts appealed provide more than enough reasons (circa 1945) to be extremely cautious? Not all were receptive to the moral of the museum’s message however. When yet another plane (this time British-German) crashed in Lower Saxony in 1989, the West German government – whose NATO- and nuclear-weapon-friendly faction had recently lost major public support – cancelled all air shows and aeronautical displays for the duration of the year.\textsuperscript{171}

After the Cold War conflict between East and West Germany was over, President Richard von Weizsäcker spoke at the Deutsches Museum in 1990 and returned to issues

\textsuperscript{170} Kershaw, \textit{The Nazi Dictatorship: Problems and Perspectives of Interpretation}, 184.
\textsuperscript{171} Bark and Gress, \textit{A History of West Germany}, vol. 1, 543.
of technology and history. Media had played a none-too-small role in creating revolutionary momentum during the previous year, which seemed to validate the notion that technological progress and the growth of freedom were, in fact, intertwined. 1990, which saw the historical unification of East and West, also occasioned the opening of the Deutsches Museum’s new departments on telecommunication technology. In his address at the opening ceremonies, von Weizsäcker rationalized the importance of both the communications exhibit and the Deutsches Museum:

History is not a matter of blind fate, but rather created by humans. So too must technological developments not be left helplessly to themselves [to whatever ends] … but that which humans have made, needs to be controlled by humans. 173

Von Weizsäcker’s sentiment aptly characterized a main theme of the museum in the period between the mid-1950s to early 1980s, if not throughout its life. In essence, the argument of the Deutsches Museum and its advocates was that the course of history – as manifested in the developments of civilization, culture, and humanity – was a thing of human creation, and that technologies were a significant means of its construction.

In the Deutsches Museum, technology gained legitimacy from its intricate involvement in culture, because its often beautiful fruit exemplified human cooperation and effective control. This was a position that ingeniously crafted together the two late-nineteenth-century opposing camps of educational and cultural politics, and was a “Chinese literati” amalgamation that the political economist Max Weber foresaw between humanists and technological-industrialists, “cultivated” and “bureaucratic” ideals of

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172 Richard Karl Freiherr von Weizsäcker (1920-) was president of West Germany, then unified Germany, from 1984-1994.
education, “Culture” and “Civilization.” Through the Deutsches Museum, the engineering class eked out a space for itself by endowing a typically distasteful subject to Bildung elites with the aura of culture on the one hand, but upholding conservative social values in the name of “responsibility” against the “lower” masses on the other. In the original conflict that historian Fritz Ringer depicted between “modernists” and the “orthodox,” the latter never claimed to be value neutral. Neither was the Deutsches Museum when conflating these positions.

What was particularly ideological about arguments by educators and advocates of the Deutsches Museum was that they strongly sought to encourage responsible behavior on the part of visitors while not recognizing, and at times even possessing little patience for, notions of misdirection, accident, or contingency in the realms of history, culture, or technology. This meant that the Deutsches Museum maintained a rather technocratic premise of robust human agency and a straightforward, problem-solving approach despite significant challenges to both postures. In the 1976 The Cultural Contradictions of Capitalism, the US social scientist Daniel Bell observed, for example, that major realms of society like technology and culture were in fundamental tension with one another. Regarding techné, Bell acknowledged emphatically that “we can make more and more things: we do change nature.” However, the drive for productivity, technical efficiency, and functional rationality was unlike the realm of culture, which was “a creation of men, [and] the construction of a world to maintain continuity,” particularly of

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174 Ringer, The Decline of the German Mandarins, 179.
175 Daniel Bell, The Cultural Contradictions of Capitalism, 2nd ed. (London: Heinemann, 1979), 165. Whether or not Bell’s entire argument holds, his analysis illuminates the ways that the Deutsches Museum was at constant cross-purposes even from a viewpoint that sought to preserve cultural continuity and values.
moral meanings.\textsuperscript{176} The areas of technology and culture, in other words, had different and not altogether controllable logics. Yet from the viewpoint of Deutsches Museum advocates and personnel, the increasingly shared conclusion that, "whatever held human collectivities together, it was not the rational calculations of their individual members," called into question the very possibility of a good society, or of democracy.\textsuperscript{177}

This was utopian thinking, a result of the early period of prosperity, that should have been difficult to maintain in the face of economic upset, even as it also made 1968 possible.\textsuperscript{178} For the avowedly democratic society of postwar Germany, the cultural value of technology for politics seemed very viable in the early years of the economic miracle. Nevertheless, just as before the war, the partiality of technological cultural politics favored some more than others. When the Deutsches Museum depicted technology in the service of democratic aims, their representations were invariably caught up in politics of "efficiency" that supported nationalistic and large industrial interests within the larger Cold War contest. Like technologists, who were consistent in their professional preoccupations and often accommodated nationalistic politics, the museum was amazingly resilient.\textsuperscript{179} Given the talented ability of employees to transform articulations

\textsuperscript{176} Ibid., 170 (emphasis original).
\textsuperscript{178} According to Weber and Engelskirchen, the conditions of prosperity seemed to have raised the standards for society and created the discontentment that led to 1968, Weber and Engelskirchen, Streit um die Technikgeschichte, 139.
of its public mission to suit the context, the Deutsches Museum was not unlike the major corporations of long duration with which it cooperated.\(^{180}\)

However, these inclinations, and the museum's socially conservative tendencies, were in fact at odds with the democratization in contemporary life. Never, in one sense, would the Deutsches Museum sympathize with a definition of culture that included “a barbeque at a Stadtsparkasse (city savings and loan) … as a cultural event,” though Turkish dining in museum halls came awfully close.\(^{181}\) The Kulturnation was however a contested concept, ranging from the sociologist Gehlen’s protective fold to an eschewal of political chauvinism that, as expressed by the 1999 Nobel Literature Laureate Günter Grass, would ameliorate ideological divisions. Yet in the Deutsches Museum, culture was a means of stabilization through which museum officials hoped that contradictions among technological logic, economic aims, and democratic goals could be held together. Enthusiasm about technology’s possibilities for society in the Deutsches Museum in the end often suppressed the fissures in society and shored up the economic and military position of West Germany in the Cold War.

Thus, though the museum proposed a model of engagement, or conversation, with all its democratic allusions, the Deutsches Museum fell short in many ways. In arguing the utility of technology for human happiness, the Deutsches Museum more often than

\(^{180}\) Business historians have noted that the top 100 firms in the U.S., Germany, and in other industrialized countries display an “uncanny” ability to remain very large over a very long period of time (since the nineteenth century). Though some have attributed the endurance of firms like BASF, Bayer, or Hoechst to their “bigness,” Carayannis and Stokes argue that the long life comes from their ability to adapt: “It may be true that there is a tendency toward consistently good performance, but focusing on it alone leads one to underestimate the hard work, good judgment, and luck needed to keep this ‘inertia’ going. […] those leading a given organization have to devise structures that facilitate learning and innovation; ironically, continuity in the organization comes from constant change,” Carayannis and Stokes, “A historical analysis of management,” 176.

\(^{181}\) Pommerin’s reflection of an article by Dieter E. Zimmer in Die Zeit, Pommerin, introduction to Culture in the Federal Republic, 15.
not asserted, rather than discussed, their claim. Instead of the dialogue they hoped to encourage, the Deutsches Museum often sent a very loud, one-way message about democracy, responsible agency, and technology. Cultural conservatism has often feared the pronouncement of media pundit Marshall McLuhan that “the medium is the message,” because it implies that the content of the message is insignificant, yet his observation does capture an aspect of the Museum. To read the list of dignitaries that visited or served the Deutsches Museum is to survey no small portion of the political and scientific history of the twentieth century. As a state-supported institution with major industrialists, scientists, and politicians gracing its stage, the “form,” or structure of the Deutsches Museum itself had much to convey about its educational politics. If the educational or institutional force that the museum hoped to gain by associating with some of these figures was troubling, so too was the service that the museum rendered to them inadvertently or otherwise; certainly, the Deutsches Museum’s educational mission made all affiliates a little more benign.

In a way, museum educators could offer no solution to the problems with which they dealt, but only more information about them. However, though educators at the Deutsches Museum overstated their case to the advantage of certain politics over others, this did not render their claims for agency, responsibility, and the potential of technology illegitimate. For how could anyone with a view of Apollo 11, or a stake in communications around the globe, think so? Perhaps, then, it was a paradox, rather than contradiction to tie technology, education, and democracy together, or to argue that the prosperity or power from technology made further research and development necessary, and that humans had to keep ahead of the game in order to remain masters of their own
free destiny. Perhaps, in light of East Germany’s collapse, the success of technological agency was in fact tied to the viability of democracy. As other technology museum educators across Germany dealt with the problem of agency, technology, and democracy, they faced the same challenges.
Under socialism, the progress of science and technology brings about the perfection of social relations, reevaluation, and emergence of a new psychology.

— V. Shinkaruk et al., Socialist Way of Life¹

CHAPTER 2 • GDR MUSEUMS, PART I

The Polytechnical Museum of Schwerin and the Productive Personality

In 1948, disaster threatened eastern Germany. Maxhütte in the town of Unterwellenborn was the only facility in the Soviet-occupied territory that could process raw iron, and water resources critical to operation neared exhaustion. Fortunately, a group of local youths rose to the challenge and, in a mere ninety days, built a mechanism to transport water from afar. Through their actions, the youths not only ensured the continuation of iron production, but also saved the war-torn economy that would later become the GDR. That, at least, was the account of “Water for Max” that visitors of the Polytechnical Museum of Schwerin (PTMS) heard. The story of Max was supposed to prove, in the words of the museum guide, that even before the official founding of the “worker and farmer state,” young people understood that “this society was their future,

this rational state would be their state, which they must build up, strengthen and not least defend!"²

When the PTMS opened in 1961, it hoped to fashion self-motivated and technologically capable youths, like those found at Maxhütte, who served the needs of their nation. Manifesting the state policies of the 1960s that encouraged scientific innovation and achievement, the museum in Schwerin sought to create the productive personality: a person who recognized that the realization of socialism required the labor of each member of society, and therefore prepared diligently for technological tasks that would facilitate socialist transformation. At the same time, and somewhat inconsistently, museum educators held that a productive personality understood his efforts as part of a larger historical movement that would not fail. Thus, the productive person walked a tightrope of theory and praxis, since the world was supposed to be on a straight socialist path, and yet needed active socialization. Orchestrating this dialectical process – and its success – was the party (Sozialistische Einheitspartei, SED); therefore, the productive personality was also prepared to respond to the latest directives of the Socialist Unity Politburo.

Yet the Polytechnical Museum’s effort to tap psychology for ideological and practical purposes touched upon a larger problem in post-fascist education. Policies of Gleichschaltung, or the attempts to bring all of German society into line under Hitler, epitomized the fascist disdain for autonomy. In contrast, socialism meant the realization of both individual and communal potential, and GDR visions of harmonious society included active and rationally assenting individuals. However, support for Hitler and

antagonism to “Bolshevik” communism had also been voluntary, particularly in the 
eastern German strongholds of National Socialism.³ Faced with the public’s 
questionable political proclivities, re-education according to socialist goals was pressing.⁴ Socialist goals were often self-frustrated as well, because educational aims were 
redefined every party congress. The party was the point on which the challenge of 
independently-minded education turned, for antifascist educators also wanted pliant 
individuals who were nationally-minded, trusted the wisdom of state authorities to ensure 
social harmony, and did their bidding. Instructors were thus paradoxically – or 
contradictorily – charged with fostering independent, antifascist attitudes in tractable, 
socialist citizens.

In the decades after the museum’s founding, disparities between the party’s ends 
and means, and between official depictions of life and people’s everyday experience, 
increasingly threatened to break through. These issues, which challenged the nation’s 
legitimacy, were perceptible within exhibitions in spite of the museum’s support of state 
policies. How museum personnel thought they could nonetheless shape the audience’s 
personality and affirm the relationship among technology, democracy, and education

³ Patrick Major, introduction to The Workers’ and Peasants’ State: Communism and Society in East 
Germany under Ulbricht, 1945-1971, ed. Patrick Major and Jonathan Osmond (Manchester and New York: 
⁴ While the GDR was more aggressive in its policies of denazification – 75% of teachers in the German 
area under Soviet control (SBZ) were let go in 1945 and an additional 5% in 1946 – it was an older 
population that initially presented cultural re-educators with a problem: two-thirds of the SBZ in 1950 were 
“socialized” in either the Empire, Weimar Republic, or Nazi regime, see Rodden, Repainting the Little Red 
Schoolhouse, 31; Dietrich Staritz, Geschichte der DDR, Erweiterte Neuaugabe ed. (Frankfurt am Main: 
Suhrkamp, 1996), 66. Yet the success of “denazification” processes was difficult to ascertain, let alone 
define: to what extent did activities or affiliations reveal a person’s actual beliefs? Norman Naimark 
recounts the difficulties for the eastern zone as a whole, while Damian van Melis’s study describes the 
impossibility of any meaningful quantification for denazification in the region of Mecklenburg- 
Vorpommern, Norman Naimark, The Russians in Germany: A History of the Soviet Zone of Occupation, 
1945-1949 (Cambridge, MA and London: Belknap (Harvard University Press), 1995); Damian van Melis, 
Entnazifizierung in Mecklenburg-Vorpommern: Herrschaft und Verwaltung, 1945-1948, ed. Institut für 
Zeitgeschichte, Studien zur Zeitgeschichte (Munich: R. Oldenbourg, 1999).
becomes clear with a closer look at the general role of technology and museums in the GDR, and the theoretical underpinnings of the PTMS itself.

**Technology, museums, and the GDR**

Technology was a subject of great ideological importance in the GDR. Indeed, socialism was supposed to be the result of the "scientific-technical revolution," a phrase that even had its own acronym among the plethora of abbreviated socialist discourse (WTR, *Wissenschaftliche-technische Revolution*).\(^5\) WTR was shorthand for the material and intellectual transformations in social structure that resulted from advances in science and technology. The scientific-technical revolution not only represented contemporary socialist society as the manifestation of larger historical processes, and thus legitimized the party's control, but also stood for scientifically based assurances of an increasingly technological and socialist future.\(^6\) As an ideology based upon technological success, however, the "revolution" also demanded concrete, scientific-technical results to retain its legitimacy. The notion of WTR came, in fact, out of a period of great optimism for technological socialism. With the Soviets' 1957 launch of Sputnik, the adroitness of Communist technology, if not communism itself, gained striking credibility.\(^7\)

Sputnik inaugurated the expansion of polytechnical education in the GDR with the complete support of Walter Ulbricht, the First Secretary of the Socialist Unity Party and head of state, for whom WTR and technological innovation had almost a hallowed

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\(^7\) The enthusiasm for space technology was like religion (*Raumfahrtsreligion*), according to Radkau, "Kontinuität und Wandel nach 1945 in West- und Ostdeutschland."
importance.\textsuperscript{8} That socialists might maintain their dominance in space age technologies, party leaders proclaimed “polytechnical education [as] the core of a socialist upbringing,” and passed educational initiatives accordingly.\textsuperscript{9} In the 1958-59 school year, administrators introduced a new curriculum for basic education with two new fields of instruction about the mechanics of production, and an overall increased emphasis upon math and science.\textsuperscript{10} The highpoint for polytechnical education occurred with the introduction of Ulbricht’s New Economic System (NES) in December 1965, in which he loosened centralized market controls and prioritized scientific and technological developments in an effort to surpass developments in the West.\textsuperscript{11} Universities redirected academic resources towards the “critical tasks” of math and science, which included data processing, engineering, cybernetics, and operations research.\textsuperscript{12} Research and teaching of the history of technology at the university level also began, earlier than in the West, and came to focus mainly on the development of production technologies.\textsuperscript{13} Finally, technology museums, which enjoyed the specific support of Ulbricht and even V.I.

\textsuperscript{8} Ulbricht served first as “General Secretary,” then First Secretary, between 1950 and 1971, Helmut Müller-Enbergs, Jan Wielgoths, and Dieter Hoffmann, ed., \textit{Wer war wer in der DDR? Ein biographisches Lexikon} (Berlin: Christopher Links Verlag, 2000). On his technological enthusiasm, see Peter Grieder, “The leadership of the Socialist Unity Party of Germany under Ulbricht,” in Major and Osmond, \textit{The Workers’ and Peasants’ State}.

\textsuperscript{9} Harry Schneider, "PMS Ordner Chronik," TLM Bibliothek, 1.


\textsuperscript{11} His attempts to ignite the East German economy throughout the 1950s (after Stalin’s death) and 1960s under his “New Economic System” plan placed much emphasis on the GDR becoming a leading technological nation, see Peter Borowsky, “Die DDR in den sechziger Jahren,” \textit{Informationen zur politischen Bildung}, no. 258 (1998); Staritz, \textit{Geschichte der DDR}, 218-21; Raymond Stokes, \textit{Constructing Socialism: Technology and Change in East Germany 1945-2000} (Baltimore and London: Johns Hopkins Press, 2000).


Lenin, were part of the polytechnical education push from the outset. In May 1960, the Politburo issued a general directive for the creation of technology museums in every Bezirk, or administrative district.

In addition to those of education, technology museums belonged to another system of institutions that furthered their ties to national politics. Imbued with ideological purpose, East German museums were to be consciously, and fundamentally, democratic. As Ernst Hoffmann, an official of the Ministry of Culture, explained: “In the years after 1945, the museums experienced fundamental change and transformation… were filled with new content, just as all of intellectual life was filled with a democratic character, the character of authentic humanism that only socialism provides.” The new content or direction, according to the eminent museologist Klaus Schreiner, resulted from thorough and purposeful alteration. To the standard museum goals of collecting, preserving, and displaying objects, museum workers added implicit and explicit supports “for socialist society” and “from a Marxist-Leninist worldview” to their representations; they espoused, in short, the “socialist citizen’s way of life.” The “socialist way of life” was a tenet of socialist ideology that entailed debate, but it always included social and moral transformations of utopian proportions that were thought possible only in a

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14 On Lenin, see Leuschner, "Technische Revolution und Bildung." On Ulbricht, see Krüger, "Zur Vorgeschichte." Krüger also maintains that Lenin’s feeling for technological museums did not mean very much, but could be used like other standard, obligatory references to socialist “canon” when explaining actions or policies.

15 "Beschluss des Politbüros beim ZK der SED zur 'Verbesserung und weiteren Entwicklung des polytechnischen Unterrichts an den Oberschulen',' Polytechnische Bildung und Erziehung 1960.


17 Klaus Schreiner and Heinz Wecks, Studien zur Museologie, IV: Institution Museum - Funktionen und Leitung, vol. 30, Schriftenreihe Institut für Museumswesen (East-Berlin: Institut für Museumswesen, 1987), 10. Schreiner was the museum director of the noteworthy Agricultural History Museum of Old Schwerin, and known in international circles for his museological writings.
socialist economic system. In opposition to discussions on the “quality of life” or standard of living in the West, the socialist “synthetic category,” as ideologues called it, was “the first way of life in mankind’s history ... characterized by true collectivism, comradeship, unity, friendship of all the peoples [in the] country, high morals, optimism, humanism, [and] respect for the working people [or] any member of the society.”

Thus, by promulgating the socialist way of life, East German museums “served the efforts of peace.” Administrators claimed to realize the goals of peace and social harmony in a Marxist-Leninist manner that distinguished their institutions from the elitist origins of the museum, and from fellow establishments in the West as well.

From the beginnings of the new republic, the Ministry of Culture regarded museums as sites of socialist cultural politics, and sought to both extend their reach and centralize their organization in the 1950s and 1960s. Under the Ministry, East Germany’s museum landscape grew in quantity: in the first year of the GDR, the nation numbered 300 museums, a number which grew to 451 in 1955. By 1968, the government counted itself a “museum-rich land” with 600. In order to guide the development of the new institutions, the Ministry for Culture sponsored pioneering

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19 Fränzel, "Museen müssen dem Frieden dienen", Sächsische-Zeitung, 22 September 1950. In the words of the observer to the conference (same name as the title), “ideas in [our] circumstances can only become a concrete force [for change] when the masses grasp them.” Museum officials saw themselves as part of the realization of greater equality and harmony because the ideas and instruction that they offered could precipitate change.
studies in museum theory, for which museum professionals around the world recognized East Germans as serious contributors. The world’s first specialized school for museologists (Fachschule für Museologen) began as early as 1954 in Köthen, moving later to its permanent location in Leipzig in 1964. Other venues included the journal *Neue Museumskunde* or *New Museum Studies*, which first appeared in 1958 and prompted the founding of the Council for Museum Issues (Rat für Museumswesen) seven years later. The National Museum Council of the GDR (Nationale Museumsrat der DDR) was established in 1968.

With the centralization of museum education, party ideologues could politicize museums uniformly and on a regular basis. Conferences, for example, were regular occasions for museum personnel to discuss how viewers could acquire beliefs that were appropriate to the new political structure of society. As “cultural functionaries,” museum personnel also had other opportunities for ideological training. For instance, museum staff could take part in distance education courses through the Ministry for

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23 Museologist Friedrich Waidacher states that the first practical steps toward a systematization of museological practices occurred after World War II, beginning with a 1955 Russian publication “Osnovy sowjetskovo muzejwedenija” (Basic Principles of Soviet Museum Studies), see Friedrich Waidacher, *Handbuch der allgemeinen Museologie*, ed. Oskar Pausch, vol. 3, *Mimundus: Wissenschaftliche Reihe des Österreichischen Theater-Museums* (Vienna, Cologne and Weimar: Böhlau Verlag, 2005), 122. With the beginnings at Köthen (a year earlier!), and the publication of *Neue Museumskunde*, it seems that GDR museologists were a strong part of the discipline’s formation and professionalization. They also continued to have an impact upon international museum science: East-Berlin’s Institut für Museumskunde (Institute for Museum Studies) was recognized worldwide for its research. See also Flügel and Vogt, eds., *40 Jahre Museologen-Ausbildung in Deutschland*.


27 “Museums serving the efforts of peace!” actually recounted a meeting of Saxon directors in 1950 who came together to discuss the newly-won standard of living in relation to specifically socialist thinking – the relationship between “base” and “superstructure” in Marxist language. See Fränzel, "Museen müssen dem Frieden dienen!"
Culture and learn how to “culturally develop” an area. Classes covered, for example, the basics on the “scientific approach,” partisanship, and “unified” stances on central issues that were required in planning (though the difference between a partisan and unified stance was difficult to say).\(^\text{28}\) By becoming a Cultural Leader (*Leiter der Kultur*), which involved a three-year certification program, local museum directors could “accelerate the realization of the Cultural Revolution and thereby contribute to the struggle for the complete victory of socialism in the GDR.”\(^\text{29}\) Thus, presentations and interpretations of the museum field became standardized or, at least, officials at the Ministry of Culture attempted to create a uniform perspective in tune with party leadership.

The point of educating the educators was to make them adept at socialist citizenship education, which not only inculcated specific values or dispositions. The Ministry for Culture also tried to reinforce the differences (*Abgrenzung*) between their institutions and those of the capitalist world, especially West German ones, and further reify the political divisions in visitors’ minds.\(^\text{30}\) That was the case with museum entrance fees, which the Ministry for Culture determined for all museums.\(^\text{31}\) In the case of the PTMS, students and retirees could get into the museums during the 1980s for a mere 20 Pfennig (pennies) – 50 for working adults – because of a state subsidy in the neighborhood of 250,000 marks. In contrast, hikes in cultural event entrance fees

\(^{28}\) Ministerium für Kultur, "Gleitwort zum Studienplan des Fernstudiums für Kulturfunktionäre," *Verfügungen und Mitteilungen des Ministeriums für Kultur* 1958, no. VI.


throughout West Germany, which a newspaper reporter attributed to a loss in subsidies, had created a veritable wasteland of culture. His article painted dramatic images of closed theaters, dissolved orchestras, and reduced or threatened universities. Thus, even the small issue of museum fees became an argument for the cultural superiority of East German socialism.

Besides citizenship education, museums also supported the GDR's political stability through their very visibility as state institutions. For a fledgling nation whose legitimacy was continually in question during the Cold War, from without and within, the presence of world-class museums and a world-class museum system would only help, and so the Ministry of Culture attempted to deliver. Profiling, or Profilierung, defined the parameters of what leading museum theorists considered "world-class." It was a two-pronged process that first required each museum to create its own profile, a combination of self-definition and mission statement in which staff outlined the specific purpose and scope of their collections. Dominating the GDR museum landscape were small, local Heimatmuseen (literally, museums of the Heimat or "home"), whose roots lay in the nineteenth century and provided easy access to general information. At the same time,

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33 The GDR preoccupation with producing products at a "world-class" level was heightened when the East came up short in comparisons with the West. Raymond Stokes notes that, before the Wall went up in 1961, a disparity between the two economies and technologies was already apparent during the Leipzig Fairs, see Stokes, Constructing Socialism. Also, by the mid-1960s, the Cultural League of the GDR (Kulturbund) kept abreast of articles that pointed to the embarrassing situation of museums in the East, like Karl Veit Riedel, "Zwischen Rokoko-Porzellan und Produktionsstabellen, Streifzüge durch Museen jenzeit der Zonengrenze - Das Bewußtsein gemeinsamer Tradition ist noch stark," Die Welt, 21 January 1967.
34 Rat für Museumswesen decides on Profilierung in 1966, see Miethe, Letter to Alexander Ständel, 9 December 1966, BA-SAPMO DY 27/2665.
35 The Heimatmuseum originated in the 1880/90s and was a symbol of a "bourgeoisie that had made peace with the Empire." In other words, its consumer-oriented and local history represented the interests of a domesticated middle class rather than the legacy of revolutionary or emancipation histories of the German Revolution of 1848. See Hochreiter, Vom Museenempel zum Lernort. Yet it was still useful to the GDR: in 1956, two-thirds of museums were Heimatmuseums. In 1982, the Ministry for Culture categorized 439 of all 642 museums as "History/Heimatmuseum," which drew 14 million of the 30.5 million visitors to all
the Ministry of Culture gave Group I status to certain museums that “exemplif[ied] the best of museum work in the GDR” and were “of special significance for the nation and to some extent, the world.”

Technology museums, however, rarely achieved Group I status, and often had to struggle for position and recognition. Although their content had political importance, and national – if not international – scope, technology museums were never central to museum planning, despite the Politburo directive of 1960. They remained few in number and significance throughout the GDR’s life. The neglect was partly due to a larger problem of resources and funds. Since the implementation of the 1960 ordinance was left to each district, officials often appended technological exhibits to their neighborhood Heimatmuseen. For example, in Saxony, representations included the industrial technologies of salt mining and iron smelting, but as local incarnations of the larger Marxist picture of social and political transformation. Thus, by the end of the 1960s, few technology museums existed, let alone had the collection and resources to qualify for museums in the country that year. See Jakob, "Zur Geschichte der Ausbildung," 84; Karge, "Museumswesen der DDR."


37 In 1976, Krüger noted the disadvantaged position of technology museums. Though a demand for Group I technology museums was made in 1986, the situation was still unremedied by the time that Martin Heyne, director of the Schiffbaumuseum (Sailing Ship Museum) in Rostock, wrote his article on the status of technical museums in 1988. According to Krüger, the Fachsektion Technische und Polytechnische Museen, Mathematisch-Naturwissenschaftliche Sammlungen des Rates für Museumswesen was originally founded in 1969. Although a working group on technical museums was restarted at the Rat für Museumswesen in 1986, Heyne noted the generally poor showing of technical museums overall: only of 714 museums, only 43 were technological and, of those, Heyne felt only eleven were worthy of mention. Included in Heyne’s list were the PTMS as well as the Technisches Museum Dresden. See Martin Heyne, "Technische Museen: Stand und Aufgaben," Neue Museumskunde 31, no. 4 (1988): 253-56; Ernst-Albert Krüger, "Zum Verhältnis von Museumsgattung unteneinander sowie zur Wirkungsweise und Bewahrungsfunktion der technischen Museen," in Konferenz der Museumsdirektoren, 17. und 18. November 1976, ed. Institut für Museumswesen, Institut für Museumswesen Schriftenreihe (Berlin: Institut für Museumswesen, 1976); Ernst-Albert Krüger, Zur Ausstellungstätigkeit technischer Museen, ed. Institut für Museumswesen, vol. 11, Studien zur Museologie (Berlin: Institut für Museumswesen, 1978), 3.

Group I. In spite of repeated demands for technology museums of Group I standing in later decades, the situation did not change.

The absence of technology museums silently challenged the character of a nation that GDR ideologues insisted was on the cutting edge of a worldwide “scientific-technical revolution” of socialism. On the one hand, there was a ubiquitous display of technology that seemed to affirm its symbolic importance in the “worker and farmer state.” In addition to the venue of local museums, places of work had part of their sites “musealised,” or put on display, so that visitors gained a first-hand experience about the work process. On the other hand, the lack of technology museums was unavoidably problematic. As Hansgeorg Haselein, the head of the Department of Culture for the district of Schwerin, opined: “the number, profile, and significance of available technical museums corresponds neither to the significance of the GDR as an industrial state, nor do they stand in balanced proportion to the other museum types.” The mere possibility that someone, from inside or outside the country, would notice a correlation between the lack of technological museums and national shortages in technological and other material resources was an uncomfortable prospect. It was even more unsettling in contrast to the situation across the border, where three of the twelve most-frequently visited museums in

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39 In 1971, there were no technology museums in Group I, but by 1975, the Verkehrsmuseum in Dresden and the Postmuseum in Berlin were awarded the standing. Karge, "Museumsweisen der DDR"; Werner Schmeichler, "Konzeption zur weiteren Entwicklung der wichtigsten Museen," Attachment to Vorlage-Nr 28/75 für die Dienstbesprechung des Ministers am 25.2.1975, 14 February 1975, BA-SAPMO DR 1/7366.
40 Kupfer, "Technische Museen - Probleme ihrer historischen Entwicklung," 53.
43 Hansgeorg Haselein, Letter attachment to Dr. Strutz, 8 May 1973, LHAS Z31/81:19053.
1982 were technological venues of excellent quality.\note{In fact, the encyclopedic Deutsches Museum’s 1.4 million visitors placed it in first position that year. In a system that rationed museum subjects like necessities, perhaps central organization and profiling prevented “redundancies” like independent technology museums.\note{Ultimately, the precarious position of technology museums reflected the questionable significance of technology for East German life. Technology was undoubtedly important, but it complicated party politics. Because Ulbricht’s New Economic System privileged the intelligentsia and individual initiative, it directly challenged centralization, the party’s authority, and even the class impartiality of socialism. Calling for the “enthusiasm for responsibility, creativity, and boldness” of factory managers, NES policies inadvertently sanctioned contests among party leadership, technical intelligentsia, and citizens.\note{Ulbricht himself began to backpedal from these implications two years later. The 1967 Economic System of Socialism (ESS) emphasized instead the interdependence of the economic system with “socialist democracy,” education, “socialist morality,” the standard of living, and even national defense. Rather than decentralization, ESS reintroduced the necessity of leadership by focusing upon “rational restructuring” and the “scientific planning of the economy.”\note{The failures of Ulbricht’s promised technological leap forward eventually resulted in a change of power and policy. In 1971, successor Erich Honecker and his “really

\note{Institut für Museumskunde, ed., Erhebung der Besuchszahlen an den Museen der Bundesrepublik Deutschland samt Berlin (West) für das Jahr 1981, vol. 4, Materialien aus dem Institut für Museumskunde (Berlin (West): Staatliche Museen Preußischer Kulturbesitz, 1982). The most visited museum in the FRG was the Deutsches Museum with 1,383,822 visitors, an “Oldtimer” exhibition of airplanes in Frankfurt was second (1,093,253), and in 12th place was the BMW museum with 500,000.

\note{Kupfer confirms that this aspect of Profilierung backfired in relation to technological museums, Kupfer, “Technische Museen - Probleme ihrer historischen Entwicklung,” 51.

\note{Baylis, Technical Intelligentsia, 240-41.

\note{Ibid., 250.
existing socialism" ushered in a new sobriety about scientific prospects, emphasized the production of everyday goods, and downplayed the importance of polytechnical education for the next decade.\textsuperscript{48} Oscillations in policy also reflected a continual struggle over who was most adept at setting the party agenda: persons from the worker and farmer ranks that were fiercely loyal to Marxist-Leninist tenets or the intellectually gifted. Both camps claimed their particular importance for socialism. Depending on which view had ascendancy, policy changes would correspondingly ripple throughout the system.\textsuperscript{49} Such was also the case in the museum world. It was not until the late 1970s and early 1980s, when Honecker refocused the party's attention to technology, that museological theories specific to technology and science museums were finally added to training curricula – a decade after theorists had addressed issues related to art and history.\textsuperscript{50} However, there was still an absence of technologically competent cadre at museum schools in the late 1980s.\textsuperscript{51}

\textit{The technology museum as tool and Krüger's productive personality}

Though support for technological education in museums in the GDR was inconsistent, a systematic and careful consideration of technology museums and their educative potential was yet underway. One of the first museums dedicated to the theme of technology in the GDR was founded during the 1960s in small, unlikely Schwerin.\textsuperscript{52} Located approximately thirty kilometers south of the Baltic Sea, Schwerin and the surrounding regions of Mecklenburg had long been a major tourist draw. For centuries,
visitors enjoyed the area’s landscape of picturesque lakes and availed themselves of its purported restorative effects; the region’s first seabaths opened in the late eighteenth century.\textsuperscript{53} The former ducal seat of Mecklenburg was also a noteworthy vacation option for GDR citizens, lying well within the boundaries of travel restrictions. Besides tourism, the economics of the region focused predominantly upon agriculture, fishing, and sea-trade.\textsuperscript{54}

The Polytechnisches Museum Schwerin was the first and only technological museum in the GDR whose efforts ever achieved comprehensiveness.\textsuperscript{55} With eight standing exhibitions and approximately 100 displays, dioramas, and interactive pieces, the Polytechnisches Museum Schwerin offered visitors a general overview of technology and its social consequences in themes centered around daily life.\textsuperscript{56} Topics included within the 930 square meters of exhibition space were the “primary sources of energy,” electrical engineering, transport and communication systems (\textit{Verkehrswesen}), metallurgy, the “Energy Revolution” (\textit{Energieumwandlung}), agriculture, architecture, and electronics.\textsuperscript{57} When the museum opened on 11 November 1961, Professor and Minister for People’s Education (\textit{Volksbildung}) Alfred Lemmritz, a delegation of

\textsuperscript{54} Ibid., 22-24.
\textsuperscript{55} Though the renowned Postmuseum in Berlin and Verkehrsmuseum in Dresden were founded before World War II, they focused on the development of single technologies rather than the subject of technology, and therefore acted like a large collection of curiosities. The PTMS was also the first technology museum created after the GDR’s founding that, unlike efforts in Magdeburg and Potsdam, achieved institutional independence. See Leuschner, "Technische Revolution und Bildung". On the PTMS’s comprehensiveness, see Schwerin-Information, ed., \textit{Schweriner Museen, Schweriner Reihe} (Schwerin: Druckerei Schweriner Volkszeitung, 1977), 18. Its equal was never built in the years after the publication.
\textsuperscript{56} Ibid.
\textsuperscript{57} Polytechnisches Museum Schwerin, "Polytechnisches Museum Schwerin," 3-4.
teachers from the USSR, and other prominent educators in the region attended the ceremonies.  

By introducing, concretely, high technology into a rural setting only months after Ulbricht erected the Wall, the PTMS exemplified the larger, aggressive attempt to transform the GDR both technologically and ideologically. Party officials had already converted a portion of Schwerin’s fairy-tale castle into a public kindergarten facility in order to reconcile area landmarks with socialist ideas. With the opening of the museum, the centuries-old palace also housed exhibitions on electricity and atomic power. A successful pedagogical institute in the area was responsible for the unusually accommodating local response to the Politburo’s 1960 call for technological museums. Also precipitating the museum’s founding was the regional need for competent polytechnical instruction, the continual lack of which faced administrators across the nation, given the rapid development of new sciences and technologies. For the effort, the regional government (Bezirkstag) of Schwerin put aside facilities and 220,000 marks.

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58 "Polytechnisches Museum im Schweriner Schloß," Norddeutsche Neueste Nachrichten, 13 November 1961. While these dignitaries were present, Krüger pointedly notes that no one from the Party was there, despite the fact that the museum had support from “the highest levels,” see Krüger, "Zur Vorgeschichte." Lemnitz served as MfV until 1963, see Müller-Enbergs, ed., Wer war wer.


60 Ibid.

61 Ibid.

During the next decade, local party officials had more precise needs for technologically trained workers. City planners wanted to industrialize Schwerin and its surrounding area. In March 1970, members of the regional central committee expressed their conviction that the "political, economic, intellectual/cultural, and athletic center of the Bezirk" needed to establish technological industries. They outlined everything from rubber engineering firms, plastic processing, and hydraulics to pneumatics, electronics, and electrical engineering developments. That local SED functionaries formulated the new plans just before Honecker's assumption of party leadership and the resulting pragmatic turn, most likely doomed them. Judging from the state of Schwerin at the collapse of the GDR, the aims of these planners to augment the profile of the city were largely unrealized.

At the outset, however, planners hoped that Schwerin's citizens would be up to the task of transforming the region, an undertaking that required not merely their technological, but also their ideological education. Think tanks like the Group for Prognosing Consciousness, for example, tested the "scientific intelligence" (wissenschaftlich-technische Intelligenz) of Schwerin between 1968-70. Examining

63 Quandt, "Die Gestaltung des Stadtzentrums Schwerin." Bernhard Quandt was the First Secretary of the Party at the District level (I. Sekretär der SED-Bezirksleitung Schwerin) from 1952-1974, see Müller-Enbergs, ed., Wer war wer.
64 Quandt, "Die Gestaltung des Stadtzentrums Schwerin."
13,700 citizens, the group concluded that 75 percent were educated, and a significant proportion was scientifically and technologically trained. In short, Schwerin’s inhabitants could more than likely catalyze the region’s economic and industrial transformation. The investigators worried, nevertheless, that the local citizenry lacked the proper ideological views of technology; the report noted a “residual discrepancy between scientific-technological education and education related to an ideological-worldview (ideologisch-weltanschaulichen), ethics, and aesthetics” on all levels from elementary schools to universities and technical colleges. Given that Schwerin and its surrounding region had been a stronghold of Nazi support – the NSDAP party had established itself in local government before Hitler took power – the transforming potential of the populace for socialism remained a question.

The PTMS was an example of a forum that addressed the gap between technological and ideological education. Specifically, it sought to fashion conscious, responsible, and self-motivated personalities, an aim mostly conceived by the museum’s second director, Ernst-Albert Krüger. Adept at pedagogical and ideological theories, the one-time director of Schwerin’s Pädagogische Bezirkshaus (District Council for Pedagogy) was an industrious writer who authored several publications of the Institute for Museum Studies and other museum series. The future chairperson of the Technology Museum Division in the Council for Museum Issues also cooperated with a
national journal on technology for youth, *Jugend und Technik* (Youth and Technology), promising to exchange on a regular basis any knowledge, experience, observed results, and problems his staff encountered while trying to "realize socialist Jugendpolitik (youth policies)." In all his essays, Senior Instructor (*Oberstudienrat*) Krüger expounded upon the educational experiences most likely to influence visitors, and translated them into strategies for the PTMS and other technological exhibitions in the GDR.

Given his pedagogical background and the pressing needs of polytechnical education in the region, Krüger approached the museum primarily as an educational institution, rather than as a cultural establishment like, presumably, the Deutsches Museum in Munich. A Soviet example existed in the Polytechnical Museum of Moscow, to be sure, but the PTMS aimed at an interactive experience that nonetheless echoed the Munich museum’s philosophy. The Schwerin museum strategy rejected the "Please do not touch" placards and attitudes that confronted the visitor at most museums. Instead, the Polytechnical Museum was a *Museum zum Anfassen*, or "hands-on" museum. It offered buttons to push and doors to pull in the hope that its lessons would strike deeper, which made the PTMS particularly adept at education in Krüger’s view. In fact, well after the East German educational system had passed away, Krüger reflected in 1996 that GDR instructional authorities “never got it,” maintaining that a visit to his museum did “more for the development of youth in two hours than two weeks of [...]"

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73 The Polytechnical Museum of Moscow was a model of communist ideology and technology, but the PTMS found its own way, Leuschner, "Technische Revolution und Bildung." For more on the Deutsches Museum and its pedagogical style, see Chapter 1. Chapter 3 returns to the PM Moscow.
74 Karge, "Ein Museum zum Anfassen"; Schneider, "PMS Ordner Chronik." According to Karge, the "hands-on" goal was one the staff tried to maintain over the decades.
dry school teaching." He argued in the same essay, moreover, that the museum’s focus
upon the mechanics of science and connection to “older traditions of engineering
education” – probably, again, those of the Deutsches Museum – made it almost free of
ideology. Yet the object of technology lessons in the PTMS had never been the simple
transmission of technological facts or knowledge. In 1970, Krüger and his staff outlined
the goals of the museum at a special exhibition in Leipzig. As a “site of general socialist
education,” the Polytechnical Museum of Schwerin aimed to provide:

1) enlightenment about the necessity of polytechnical education
2) an acquaintance with the important fundamentals and main branches of
production
3) an introduction to the fundamentals of the technology of tomorrow
4) help for the socialist education of youth and
5) self-motivated or independent activity (Selbstständigkeit), the primary principle of
socialist didactics and also the foundation of joyous learning in a museum.

Through these five points, Krüger expressed the museum’s two main aims: a smaller goal
of effective technological education as a means to the larger one of robust active citizens
sensitive to social and national interests. Not merely an institution that transmitted the

Krüger, "Zur Vorgeschichte."

Like many former functionaries of the GDR, PTMS former director Ernst-Albert Krüger wrote a brief
memoir after 1990 that downplayed the relationship between socialism and his work. Krüger’s essay
followed a train of post-1990 “self-exculpations,” as Mary Fulbrook called them, examples of which
included Egon Krenz, Wenn Mauern fallen: die friedliche Revolution—Vorgeschichte, Ablauf,
Auswirkungen (Vienna: Neff, 1990); Günter Schabowski, Der Absturz (Berlin: Rowohlt, 1991); Brigitte
the museum’s pedagogical focus gave Krüger relative independence seems likely. As Krüger noted in his
memoirs, the museum itself was unusual in that it was so influenced by teachers. Krüger also implied that
the Minister Lemnitz himself saw the opportunity to install pedagogues who were relatively independent
from state and party under the guise of the problem of finding competent technological instruction. Yet
“freedom” came probably more from Ulbricht’s policies, and also because the PTMS appears (through
neglect?) to have been caught administratively between the Ministry of Culture and other bodies that
oversaw scientific education (like Margot Honecker, the Minister for People’s Education from 1963 on and
Erich Honecker’s wife, to whom Krüger was quite averse). While these functionaries could not be entirely
free from state and party, Krüger was probably relieved of having to alter PTMS exhibitions according to
the new party line that followed each congress, as he maintained. See Krüger, "Zur Vorgeschichte."

basic principles of technology for today and tomorrow (points two and three), the PTMS would “enlighten” its visitors – especially young ones – about the necessity of technology for a socialist society (points one and four). Understanding the importance of technology, visitors would then be self-motivated to place socialism on a firm foundation (point five). Abridged even further, the purpose of the museum was to inculcate technological responsibility and productivity as values for socialism.

The effort to fashion a responsible person with technological and socialist proclivities, Krüger argued, would be accomplished through active learning, a method that related to the museum’s goals on several levels. For one thing, active learning corresponded well with the Selbsttätigkeit – or self-motivated, independent activity, understanding, and learning – of point five.\(^{78}\) Krüger believed that an active environment would “disclose optimally the informational content of museum objects” and make the museum visit a “cultural experience that contribute[d] to the development of the visitor’s personality … without spoon-feeding them.”\(^{79}\) This activity was crucial to the education of visitors as persons, and more importantly as socialists. Thus, the active learning model at the heart of the PTMS not only carried out the museum’s smaller goals of technological education, but its larger political goals as well.

Krüger’s reference to “personality” was itself a category of socialist education that added another dimension to his idea of a proactive, self-motivated learner.\(^{80}\) As opposed to the emphasis on heredity during the Nazi period, socialist psychology focused

\(^{78}\) Selbsttätigkeit was a by-word of cultural propaganda. An example of its centrality to Heimatmuseen is in Heinz Wolter, ”Die kulturelle Massenarbeit,” Neue Museumskunde 3, no. 2 (1960).

\(^{79}\) Krüger, Zur Ausstellungstätigkeit technischer Museen, 12.

on factors of environment for determining an individual’s behavior. Thus when “socialist way of life” theories, for example, focused on the problem of personality, they were pursuing a system that would shape persons more likely to affirm socialist values. The 1965 Statutes of the East German Unified Socialist Educational System demanded the “education and upbringing of well-rounded and harmoniously developed socialist personalities [emphasis added]” who would become the bedrock of socialist society. In particular, socialist personalities were those that “consciously shaped the communal life, transformed nature, and led happy, worthy (menschenwürdigen) lives.” Conscious participation and assent, therefore, were characteristics that all socialist educators were supposed to encourage, and their place in educational theories lent support to Krüger’s ideal of an active and self-motivated visitor.

Krüger felt that the active dimension of technology museum exhibitions made them especially well-equipped for the task of shaping socialist personalities. The task of all museums was, in Krüger’s words, to “mediate aesthetic and intellectual impressions, knowledge and understanding, and develop [human] faculties in accordance with the principles of science and a frank partisanship based upon the Marxist-Leninist worldview.” Museums in the GDR could in fact provide a multifaceted education that matched the complex dimensions of human nature, because they were amalgams of the “achievements” of all branches of socialist social science (which included education,

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83 Gesetz über das einheitliche sozialistische Bildungssystem, SS 1/1, In Gesetzblatt 1/6 (Berlin), as quoted in Leuschner, "Technische Revolution und Bildung." Another example of socialist personality formation is in John, "Persönlichkeitsbildung und Jugendklub."
84 Gesetz über das einheitliche sozialistische Bildungssystem.
85 Krüger, Zur Ausstellungstätigkeit technischer Museen, 8-9.
culture, art, and economics, along with science). However, because the technology museum employed an interactive experience that engaged multiple senses, thereby availing itself of multiple, mutually-reinforcing learning paths, it was most suited to the task of shaping multidimensional persons. By 1982, for example, the museum even had a robot that greeted visitors as they entered.\textsuperscript{86} Since the technology museum did not have to depend entirely upon vision, it was qualitatively different from an art museum; because it could not be escapist or passive, the PTMS was therefore better than a film or television.\textsuperscript{87}

Strategies for an active learning environment were not merely about the pedagogical power of technology museums, for they always had ideological import as well. One example was the “everyday” nature of technical museums, or their focus on “things of the world of labor.”\textsuperscript{88} The practical relevance of a technological collection was thought to appeal to a general audience, especially workers. Since a focus upon labor, which was also the heart and soul of socialist schemes, created a more egalitarian space, technological display had theoretical sympathies with socialism that many “elitist” art museums could never achieve. Krüger pushed for an abbreviated but powerful exhibition style as well. Krüger suggested the “masterpiece” or complete collection strategy of the Deutsches Museum was without pedagogical force, though any attempt at such a strategy by the PTMS would likely have failed. Instead, incomplete technological genealogies showed that the past mattered only because it indicated the possibilities for future transformation, a tenet of socialist histories. For example, the PTMS could show the development of transportation devices in five steps: a single person’s haul, wagons

\textsuperscript{86} [Schneider?], "Chronik (Kopie) des Museums 1959-1997," 52.
\textsuperscript{87} Krüger, "Polytechnische Museen," 100.
\textsuperscript{88} Ibid.
with wheels, a locomotive, an airplane, and a spaceship. “Minimizing the time-spans between [consecutive] technological developments” was important so that the viewer’s “impression of overall transformation ... is intensified.” With its implicit promise of better living in the near future, the depiction of transformative power – technologically or ideologically speaking – was a perfect lesson for pastoral Schwerin.

Krüger also “actively” engaged youth, in particular, about self-motivation and responsibility, most notably in Jugendweihe (youth confirmation) classes. The party’s counters to church confirmation classes enjoyed the participation of all school children, and were prerequisites for a nationwide coming-of-age service for young teenagers. Occurring at any number of educational and cultural sites, Jugendweihe classes allowed educators to be most explicit about the ideological significance of their subject, like art or sport, for socialism. When led through a technology museum in specially designed Jugendweihe tours, for which the PTMS enjoyed a certain popularity, students learned the ideological lessons of technology. Hosting these classes also allowed the Polytechnisches Museum Schwerin to state with authority its support of the socialist school mission to “shape and raise up socialist personalities.”

In theory, then, the museum and its goal of creating self-motivated and active personalities aided the realization of socialism in three ways. First, as a “museum to touch,” the PTMS was an approachable museum that belonged to and was meant “for the people.” Socialism in this sense was a set of egalitarian relations, articulated in the institution’s anti-elitism. The PTMS was also socialist, however, because it aided

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89 Ibid.: 90.

90 The Jugendweihe was introduced in 1954. Merrilyn Thomas, “The Evangelical Church in the German Democratic Republic,” in Major and Osmond, The Workers’ and Peasants’ State.

91 Polytechnisches Museum Schwerin, "Polytechnisches Museum Schwerin."
technological and social endeavors. In Krüger’s view, technology museum exhibitions helped people realize that the acquisition and application of technological skills were themselves “act[s] of revolution,” because they contributed to the world, or socialist, historical process by ensuring the economic success of the GDR. This effort also required a personal transformation or, in Krüger’s words, an “acknowledgment of one’s personal responsibility before history.”

Therefore, in fostering the productive personality, Krüger and his staff were not merely creating pro-technological and self-motivated attitudes in students and other visitors. They were, thirdly and ultimately, creating the conscious and happy citizen of socialist aspirations.

Of course, activity and self-motivation had their limits; there was, for example, little room for criticism of technology. Socialism and a pro-technology attitude, in Krüger’s estimation, went hand in hand. Any negative feelings about technology were the fault of capitalist countries, the creators of “mass manipulation” that associated technology with joblessness, environmental disaster, and the downfall of culture.

Krüger also condemned the Western anti-technological posture as sexist, since it contributed to the reluctance of many women to pursue technological studies. In fact, museums in the West had promoted a negative technological propaganda (Technikpropaganda), according to Krüger, that intensified fears about technology. Their failure to show the liberating potential of technology basically placed Western technology museums “in the service of the ruling class.”

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92 Krüger, Zur Ausstellungstätigkeit technischer Museen.
94 Ibid.
95 Ibid., 71-72.
The notion of personal self-motivation or independent activity was not valued in itself, but only if it followed narrowly-defined political objectives of state building and victory in the geopolitical conflict. As party leader Honecker declared, "art and culture should contribute to the development of personalities that can assume an unshakable socialist standpoint in the great international standoff between socialism and imperialism as well as in our society."\(^{96}\) A posture of militancy was therefore also appropriate and even critical to the self-motivated socialist personality, since ideologues made a distinction between a private, selfish "individualism" and a creative, "free," and social "individuality" that included an unquestioning adherence to orders of the armed forces.\(^{97}\) Museums like the PTMS could also contribute to militant partiality, most of all during Jugendweihe classes, for which youth were strongly encouraged to show up in Free German Youth Brigade (Freie Deutsche Jugend, FDJ) clothing.\(^{98}\) In contrast to organizations like the US Boy and Girl Scouts, FDJ had a military bent that included weapons training and intensified over the years.\(^{99}\)

The active learning in museums made for, as Krüger called them, "particularly good possibilities for overcoming latent or new ideas (Bewußtseinsinhalte, literally contents of consciousness) of the [capitalistic] kind inherently antagonistic to our

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\(^{96}\) As quoted in Karge, "Museumswesen der DDR." Honecker served as General Secretary of the SED ("First Secretary" for the first five years) from 1971-1989, see Müller-Enbergs, ed., Wer war wer.


\(^{98}\) Polytechnisches Museum Schwerin, Hinweise zur Durchführung, 3.

\(^{99}\) The FDJ 1982 slogan "Peace must be armed!" was a response concocted by Margot Honecker (Minister of People's Education) to growing opposition and a peace rally in Dresden against mandatory military education (also the "brain-child" of M. Honecker, who made field and firing practice mandatory for ninth and tenth graders in 1978). See Rodden, Repainting the Little Red Schoolhouse, 156-57.
society.”^{100} Yet the demand for militant and party-loyal attitudes conflicted with other socialist visions of happy individuals, conscious assent, and harmonious egalitarianism. The difficulties of balancing these claims were visible, at least, in the PTMS exhibitions of the 1970s and 1980s within three areas: technological history, energy, and agriculture.^{101}

History lessons: human character through time

As contrary as they might seem in a forward-looking technology museum, history lessons were ubiquitous in the PTMS. From Krüger’s point of view, however, any engagement with history had to draw conclusions with present and future relevance. The “mediation of historical consciousness” was in fact necessary to the ideological development of a socialist person.^{102} Small wonder, then, that many historical exhibitions were in the introductory room of the museum. “Room A” not only presented the viewer with a historical perspective on technology, but also encouraged his active, or productive, state support. More precisely, the PTMS tried to create a sense of nationalism and destiny through retellings of past East German success that also pointed to future triumph. History told in this manner would then motivate youths to pursue

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^{100} Krüger, Zur Ausstellungstätigkeit technischer Museen, 72. Another take on socialist historical consciousness is Reuter, Geschichtsbewußtsein in der DDR.

^{101} On the dating of the exhibitions: the exact dates of origin for these displays is unknown. They were certainly all created by 1979, and notations within the museum’s archive indicate that a good number of them existed before and well after, see TLM PMS Ordner (103): Bildmaterial – Ausschnitt; Polytechnisches Museum Schwerin, Hinweise zur Durchführung; Polytechnisches Museum Schwerin, ”Polytechnisches Museum Schwerin.” Most likely, they are from at least 1970 (the energy exhibit began in 1966). Technology museums in general were slow to remodel standing exhibitions because of the substantial resources required and by the continual effort to represent the onslaught of new technologies.

^{102} Krüger, Zur Ausstellungstätigkeit technischer Museen, 31. Stefan Berger shows how history in the GDR, and the constructions of national identity it offered, was a way to overcome the existing national “paradigm” in 1945 and created the foundation for an entirely new tradition, Stefan Berger, ”National Paradigm and Legitimacy: Uses of Academic History Writing in the 1960s,” in Major and Osmond, The Workers’ and Peasants’ State.
technical jobs and, for the public at large, would bind citizenship closely to a proto-
technological posture.

One of the first displays encountered by visitors to the Polytechnical Museum suggested a particular synergy between technology and socialism, and had special meaning for East Germans as well. Room A contained an interactive timeline centered around the German Revolution of 1848, which was the first attempt at democratic government in Germany. Illustrations of technological achievements covered the whole of modern history and visitors could illuminate events on the timeline with the push of a button. For example, one could learn that J. B. Francis invented pinnacles of turbine development in 1849. Visitors also learned that the introduction of the steam-powered plow of J. Fowler took place in 1850. While the technology was not all German, the heart of the display were sketches of the “incomplete bourgeois” Revolution of 1848-1849 and of Karl Marx and Friedrich Engels, whose *Communist Manifesto* was first published in February 1848.103 In this manner, the museum associated all technological developments to a specific political moment, implied the special place of Germany in history, and showed the promising interaction of technology and socialism for the GDR’s own revolution.

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At bottom, the PTMS argued that history revealed socialism as a necessary step in the evolution of human societies. The museum’s account of evolutionary history described a long, progressive movement of events towards socialist work relations. Thus, while prehistoric man might seem out of place in a museum of modern technology, the PTMS used him to illustrate that the correlation between the quality of social relationships and “the means of production,” or labor and technology, was as old as mankind. For example, one display averred that in prehistoric society, equality reigned – if “survival of the fittest” can be taken for egalitarianism – and exploitation was impossible, though living conditions were unsurprisingly less than desirable. Viewers could then follow a train of development from prehistoric times through capitalism to what the museum presented as mankind’s apex: socialism. In socialism, the advantages of prehistoric society were recaptured but improved upon, since the “social ownership of
the means of production ensures that society as well as individually useful labor is free from exploitation."\textsuperscript{104}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure6.png}
\caption{"The Character of Labor Depends on the Relations of Production"}
\end{figure}

Moreover, historical analysis showed that human productivity was caught up in the larger developmental process as well. "The System of Productive Forces" was a diagram that explained the numerous factors that went into any production process. Evaluating the amalgam of productive forces was tricky because, as the museum pointed out, they were many: the collective weight of a "totality of subjective and objective factors in the production process." The factors were neither few nor simple, including

\textsuperscript{104} Polytechnisches Museum Schwerin, "Der Character der Arbeit - Sozialismus," TLM PMS Ordner (103) Photo #F87; Polytechnisches Museum Schwerin, "Der Character der Arbeit - Urgemeinschaft," TLM PMS Ordner (103) Photo #F85.
matters like education, planning, and leadership; skills in prognosis, organization, and analysis; as well as science and research, which were further defined as discovery, technology, and development. Together, they determined the “Main Productive Power of Humanity.” For those less able to negotiate the intricacies of the diagram, the placard proclaimed explicitly that “the productive power of humans” corresponded not only to the level of their “developed personality (Persönlichkeitsentwicklung)” but also to “the use and transformation of nature, the development of production in its totality, the development of the means of labor and behavior.” This formula of productivity captured the overall message of the museum’s introductory room: that the course of history and human action was rational, technology was a key component in its development, and greater productivity would logically follow.

Yet the “descriptions” offered in the productivity display, as well as Room A itself, were rather closer to prescriptions, especially for youth. In particular, youth confirmation (Jugendweihe) sessions made all the implications of Room A’s history lessons explicit. Productivity, for example, became an open directive. Suggested Jugendweihe themes hammered away at the idea of individual responsibility, as the program titles show: “Socialism: Our Today and Tomorrow – What the People’s Hands Creates, Belongs to the People,” “Your Labor, Your Responsibility, Your Inheritance,” and “On the Way to a Happy Future: Being Prepared for a Communist Tomorrow.”

The class on “Our Today and Tomorrow,” for example, provided basic knowledge on the development of production in the GDR, and also made connections to the school subjects of geography, history, and citizenship or social studies (Staatsbürgerkunde). In this way, a trip to the museum could develop the students’ sense of nation and duty, and thereby promote (hopefully) diligent production.

Jugendweihe classes also explicitly reinforced the nationalist lessons of Room A, using an antifascist version of German history that deepened a sense of difference with West Germany. Explaining that the GDR took the “opportunity with the destruction of Hitler fascism to overcome capitalism,” an educator would justify the centralizing economic policies of the nation in light of the Nazi past. Destroying fascism required, more precisely, the “democratic” land and industry reforms that collectivized property and production formerly owned by fascist “criminals.” Session leaders later equated capitalism, imperialism, and fascism, thereby creating a different trajectory for the nation from its Western other, while shifting the blame for World War II and the Holocaust

106 Polytechnisches Museum Schwerin, Hinweise zur Durchführung, 4.
107 Ibid., section I: 5.
108 Ibid.
across the border as well. Moreover, the museum suggested that session guides use the
war and Western “imperialism” to explain the disadvantaged state of the East German
economy, which included lags in metallurgy, and even the division of Germany itself.

Finally, youth sessions were occasions in which the PTMS again used long
history, or archeology, to prove the superiority of socialism. One class in particular
maintained the existence of a deep human biological or physiological proclivity for
socialism, whether a state of harmonious communal relations or the anti-capitalist
version. With skeletons and depictions of the evolution from ape to man that focused on
heads and hands, the PTMS argued that human survival required cooperation, and
suggested that the necessity prompted corporeal transformations for thought and speech.
The sheer faculty of speech thus “proved” humanity’s inherent social character.
Progressively dexterous hands also showed that labor, like language, involved a
collaborative effort that developed over time as well, which further exemplified the
intrinsic quality of human interdependence. Jugendweihe leaders could therefore malign
capitalism, whose very concepts of private property and wage labor misunderstood
natural relations. “In capitalism,” instructors asserted, “work is a method of exploitation,
but in socialism, a condition of life and a thing of honor.”109 They could also use the
theory of language to uphold ethics of social behavior, like the fundamental duty of each
individual to the group. Since knowledge, like language, was only gained corporately,
Jugendweihe leaders demanded better learning on the part of visitors as part of their
communal responsibility. The acquisition of technological skills, as the PTMS program
noted, was especially pressing.110

109 Ibid., section II.
110 Ibid.
Whether encountered independently or within a Jugendweihe class, history lessons in the PTMS had pragmatic results in mind despite their philosophical ruminations over human existence. In a country where the dominant telling of the history of technology was a story of production, the goal was unsurprising. The museum wanted future technicians, since productive power was an “essential precondition for social progress,” and part of the “responsibility of men” included the “transformation of social relations, the further development of socialist society, and the construction of the material-technical basis of communism.” The museum suggested that visitors, especially students, could actively assume such responsibility by examining their technological career aptitudes during Jugendweihe discussions. However, the simple recognition that technology was good for the republic was sufficient. When the museum displayed, for example, renowned scientist Manfred von Ardenne’s electron-ray multichamber kiln, it did so while purposely glossing over the intricate technological details. In this case, it was more important that the representation of the nation’s resources for technology instill confidence in the viewer about the GDR’s flourishing prospects in years to come.

The energy problem and the limits of consciousness and responsibility

There were limits to the museum could hope to accomplish, given its size and remote location “at the edge” of the nation-state (“Land am Rand”). The little museum was relatively successful: only five years after the PTMS first opened its doors, the

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111 The alternative possibility for a history of technology was stifled in Dresden. See Chapter 3.
museum hosted anywhere from 4,300 to 5,100 visitors each month.\textsuperscript{114} Thirty-five percent came of their own accord, while the rest visited in groups that included children, teachers, and locally stationed soldiers from the Soviet Union.\textsuperscript{115} Between 1979 and 1981, the PTMS ranked second in the nation in density statistics (number of visitors per square meter).\textsuperscript{116} The meaning of these figures is difficult to determine; for instance, the museum enjoyed popularity partly because of the castle, a stop well worth the time for any visitor to the region. Nevertheless, crunching the numbers helped the museum to prove its own productivity, especially to the Central Administration for Statistics (using Form 837 museum year-end reports).

Ironically, the exhibitions on energy, which included displays on calculation technology and productivity, were intended to show national viability but revealed in fact how dubious the prospects were for the GDR. Energy was an area of technology that had great significance to socialism, because it was considered, not without reason, critical to the movement’s success. Lenin himself gave voice to the sentiment when he averred that communism was “the power of the soviets plus the electrification of the entire land.” In fact, the quote occupied a prominent place in the museum’s lecture room and, though Lenin was referring to the Soviet Union, technological enthusiasts in the GDR shared the conviction. However, one of the chief problems facing the nation was limited resources. Factories that survived both the war and Soviet dismantling found themselves, after the separation of East and West Germany, bereft of the relatively abundant supplies of fuel.

\textsuperscript{114} Krüger, "Polytechnische Museen."
\textsuperscript{115} Krüger, "Polytechnische Museen." Krüger reports 1,500 to 1,800 individual visitors per month, who made up 35 percent of the whole. Something, however, must have happened at the end of the decade when numbers hit a yearly low of 19,284 (1968) and 18,862 (1969), LHAS Z19/97:3, "Fachberichterstattung (Statistik),” (Landesarchiv Schwerin).
\textsuperscript{116} Krüger, "Zur Vorgeschichte,” 13. 1981 saw 80,138 visitors, a number that included visits to a nearby observatory that the museum also administered, LHAS Z19/97:3, "Fachberichterstattung (Statistik)."
from locations like the FRG’s Ruhr Valley. The museum tried to demonstrate the positive solutions that science and technology offered when combined with an adept planning system and trained, willing citizens, but energy displays inadvertently disclosed their inefficacy.

The museum’s section on energy economics (Energiewirtschaft) included an analysis of the nation’s energy requirements, the “revolution” or rapid development in energy technologies, and the processes of energy distribution.\textsuperscript{117} In the “Energy Revolution” displays, museum educators even helped visitors to visualize their land as an energy system.\textsuperscript{118} At “Main Locations of the GDR’s Energy Economy,” a display that extended from floor to ceiling, viewers could push three buttons that each illumined different connections among the nation’s regions. The first button, for example, lit areas that mined coal or imported petroleum. Pushing another button would then give the visitor a view of energy consumption in proportion to varying megawatt levels. Through the depiction of East German energy production, distribution, and consumption, the PTMS showed an energy web that encompassed the entire nation, and implicitly represented the GDR as an advanced technological state. The display simultaneously

\textsuperscript{117} Krüger, "Polytechnische Museen," 93.

\textsuperscript{118} On the relationship between maps and territorial formation, see Michael Biggs, "Putting the State on the Map: Cartography, Territory and European State Formation," \textit{Comparative Studies in Society and History} 41, no. 2 (1999). Biggs explains that state maps are the result of a qualitative change from the dynastic to territorial state, the latter of which resulted from an interchange between developments in the science of cartography and the centralization of state power. As symbols of modern political power, maps were important in creating a sense of territory and legitimacy for a brand new state like the GDR.
demonstrated visibly the necessary interdependence or cooperation that successful socialism demanded.

For the GDR, the web of energy necessarily included cooperation with the Soviet Union. Energy exhibitions showed the country’s energy relationship with the USSR, which the Ministry for Culture wanted museums to represent clearly and positively. In a 1967 communiqué on the fiftieth anniversary of the Soviet October Revolution, the ministry emphasized that the USSR is the most important trade partner of the GDR ... and in the coming years a greater increase is foreseen. [...] It would be appreciated if museums, above all the technical and scientific ones, took up the task of making clear the economic and scientific relationship between the USSR
and GDR and ...the friendly support [we] have received for the construction of socialism. \(^{119}\)

Visitors to the museum could see a specific “result of German-Soviet friendship” in the exhibition on “Petroleum: The Lifeblood of Our Chemical Industry,” which depicted the GDR-USSR pipeline. \(^{120}\) The PTMS made the advantages of maintaining close ties to the USSR even clearer: according to the display, the primary advantage of petroleum was that it led more quickly and cheaply to consumer products – no small enticement for the average East German.

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\(^{119}\) Kurt Bork, Attachment to letter to Bänniger, 1 February 1967, BA-SAPMO DY 27/2665.

\(^{120}\) Polytechnisches Museum Schwerin, “Erdöl - das Blut unserer Chemie,” TLM PMS Ordner (103).
Representing the GDR as a technological state with powerful connections did not mean that the museum failed to acknowledge energy challenges. For example, the installation on brown coal (lignite), an inefficient fossil fuel upon which East Germany was heavily dependent, underscored the point about limited reserves: “Begun [from lifeforms] seventy million years ago,” the product taking millennia to emerge was going to be “used up in [a mere] one hundred.”\textsuperscript{121} The display refrained from mentioning the grave environmental effects of lignite usage, but that was beside the point. The entire premise of the museum was that a skilled, problem-solving community could address these problems creatively. Indeed, that was the lesson of the “Water for Max” story, whose props were situated right next to a display on responsible water practices (entitled “How Much Water Do We Have? How Much Water Do We Need?”).\textsuperscript{122}

As Krüger himself elaborated, technological solutions to national problems began with an adequate knowledge of the environment, which socialist science claimed to possess. In fact, nature was an important factor in the realization of socialism because it provided the materials for abundance, that is, when efficiently used. Krüger encapsulated the socialist relationship with nature in the formula “Nature – Humanity – Technology,” which signified a struggle (Auseinandersetzung) with the environment that aimed more at unlocking its wealth – and power – than minimizing human effects upon it.\textsuperscript{123} Equipped with a knowledge of nature in tune with socialist “laws,” scientists and planners could then provide the practical know-how for the powerful and efficient use of supplies.

\textsuperscript{121} Polytechnisches Museum Schwerin, "Braunkohle, ein fossiler Brennstoff," TLM PMS Ordner (103) Photo #F35.
\textsuperscript{122} Polytechnisches Museum Schwerin, "Wieviel Wasser haben wir - wieviel Wasser brauchen wir?" TLM PMS Ordner (103).
\textsuperscript{123} Krüger, Zur Ausstellungstätigkeit technischer Museen, 22.
Proving, therefore, that planners had a handle on industrial and technological matters was important, and the exponential increases in calculation technology of recent years argued eloquently for the possibilities of planning. The PTMS offered tangible proof of national skills by showcasing, for instance, the OPREMA, East Germany’s first calculating machine. Performing 1000 operations a minute, OPREMA helped renowned Zeiss Manufacturing to maintain its edge in lens manufacture or, in the museum’s words, its “world-class status.” Mathematical superiority thus showed the world, or at least GDR citizens visiting the PTMS, that the nation could compete. Museum displays also pointed out that calculation technology was crucial in the Sputnik endeavor, and cited advances in everything from regional planning to ethnology. Butter distribution, for example, was an economic problem solved by computation, as was the deciphering of Mayan hieroglyphics by Soviet scientists.

However, it was actually the people – when trained in technology and guided correctly – that were supposed to realize the socialist dream. Instruction in the logistics of problem solving was therefore an important task of the PTMS. The museum wanted visitors and especially children themselves to be adept at, for example, calculations. One of the most beloved objects in the museum was a giant working calculator, which staff built after discovering that a disproportionate number of students did not know how to use one properly. With buttons the size of hands, “SR-1” (for Schulrechner, school calculator) was a favorite with students, and also fulfilled Krüger’s demand that

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124 Polytechnisches Museum Schwerin, "Die Mathematik durchdringt immer neue Gebiete der Wissenschaft und der Produktion," TLM PMS Ordner (103) Photo #F89.
125 Ibid.
technology museums be fun.\textsuperscript{127} The calculator must have been popular and effective; many schools and industries requested specifications from the museum in order to construct one of their own.\textsuperscript{128}

Unlike the cooperative, problem-solving community of planners and society that the museum represented, socialist energy policies reflected the hierarchical workings of the state, with the populace beneath scientists or party leaders, especially when it came to controversial issues. The realm of scientific and technological inquiry was not free, contrary to Krüger’s protestations. As the energy displays on the USSR themselves revealed or reinforced, East Germany had complete control neither over its energy nor its politics. In 1965, for example, the GDR only received 8 million tons (West Germany was importing 75 million in comparison), and though later numbers reached 19 million, the USSR had originally promised 40. Reductions to the already small petroleum supply to the GDR were the result of the Soviet Union’s own politics, particularly in connection with the oil crises of the 1970s and the Soviet-Afghan War (1979-1989). Without steady, abundant petroleum, East Germany could not support the production of new-generation thermoplastics that made up many cheaply available consumer goods.\textsuperscript{129}

The problematic implications of geopolitics for energy technologies became especially clear in issues of atomic power, which advocates distinguished from nuclear armaments. To be sure, the glorification of atomic weaponry was not in keeping with the peaceable ideals of GDR museums, if not the GDR itself. As the museologist Schreiner

\textsuperscript{127} Krüger, \textit{Zur Ausstellungstätigkeit technischer Museen}, 86.
\textsuperscript{128} Ausbildungsleiter Paprzycki, Letter to Polytechnisches Museum Schwerin, 14 October 1986, LHAS Z19/1997:21. This request was one of more than thirty in the LHAS file.
put it, “the most burning political issue facing the present is preventing a nuclear inferno and the self-annihilation of humanity, and realizing concrete disarmament measures based on equality and equal security for all.”\textsuperscript{130} The museum, which he called “a battleground for peace,” was therefore a site in the struggle to help prevent the catastrophe.\textsuperscript{131} It was the socialists alone, according to the argument, that represented the interests of all humanity in opposition to projects like the United States Strategic Defense Initiative, “an undertaking of the aggressive circles of the USA Imperialists and NATO” that “heightened the risk of human self-annihilation” in Schreiner’s opinion.\textsuperscript{132} The GDR and its museums, he averred, worked to help free the world of all atomic weapons.\textsuperscript{133}

In the eyes of the public, however, nuclear power still posed environmental problems. This was despite the fact the Soviet Union had truly inaugurated the “peaceful” use of the atom with the world’s first reactor for energy purposes.\textsuperscript{134} Anti-nuclear movements in the GDR – and across the world – in the 1980s, which swelled after the Soviet Union’s Chernobyl nuclear plant accident, made the unease clear.\textsuperscript{135} The questioning of nuclear and environmental policies in the GDR would not have been foreign particularly in Schwerin, which was home to the nation’s first ecological demonstrations.\textsuperscript{136} Perhaps activists desired to maintain the picturesque surroundings for

\begin{footnotes}
\item\textsuperscript{130} Schreiner and Wecks, \textit{Studien zur Museologie, I.}
\item\textsuperscript{131} Ibid.
\item\textsuperscript{132} Ibid.
\item\textsuperscript{133} Ibid.
\item Joachim Kahler, \textit{Die Kernenergiepolitik in der DDR: Zur Geschichte uneingelöster Fortschrittshoffnungen} (Cologne: Verlag Wissenschaft und Politik, 1998), 64.
\item Bruce Allen, \textit{Germany East: Dissent and Opposition}, revised ed. (Montréal and New York: Black Rose Books, 1991), 138. See Chapter 3 for more on nuclear concerns and connections between the peace movement and ecological issues in the GDR.
\item Church-based ecological activism in the GDR can be traced back to November 1979, when 50 members of a church-based Schwerin youth group – together with a local firm – planted trees and bushes along a new tramline. An “informal bicycle protest,” a practice that gained followers around the country, also took place to oppose the construction of a new motorway through a park area, Ibid., 137. See also Wolfgang
\end{footnotes}
which Schwerin was known. For this audience, in any case, an appeal to “clean” atomic energy – even in comparison to the horrors of brown coal that even Honecker confirmed – would not have worked.\footnote{Allen, *Germany East: Dissent and Opposition*, 138.}

Representing nuclear power as one of the most important ways to compensate for the nation’s limited resources, the mere fact of the PTMS display pointed to tensions within its educational model: was it permissible for a self-motivated, independent personality, in possession of socialist ethical sensibilities, to question if atomic energy was indeed responsible? Despite the GDR’s best intentions, the country was unable to transition to atomic energy, whether due to the decrease in Soviet support or other internal problems. However, Krüger and his museum wanted to treat issues like atomic energy as a matter of trust for the populace, or as straightforward problems that the party and its scientists would eventually solve. That, indeed, was the entire point of technology. “Ultimately,” wrote Krüger, “when it comes to the development of technology, it is always about mastering problems that arise in the encounter with nature,

\footnote{Rüdenklau, *Störenfried: DDR-Opposition 1986-1989 Mit Texten aus den 'Umweltblättern'* (Berlin: BasisDruck Verlag, 1992), 47.}
but that also arise in their social labor and in social life, which humans are constantly seeking to solve." To trust the problem-solvers, then, was not to ask about responsibility and nuclear technology. It was also not to ask about energy overall: as brown coal continued to supply 82 percent of the nation’s power during the mid-1980s, efforts to protect the environment articulated in the People’s Chamber (Volkskammer) law of 1970 unsurprisingly withered away.  

_The pastoral ideal: dissolving the lines between party and people_

Energy exhibits emphasized the superiority of scientists and planners to the larger public, but other areas of the museum elided this difference in an attempt to motivate enthusiastic responses for socialist policy. Given the rural context of Schwerin, agricultural exhibitions provided important opportunities to assert the commonality of party and public desires. Specifically, the museum portrayed agricultural science as yet another proof of the superiority of state socialism. Improvements in the grain harvest and conditions of manual labor showed in general “how the intelligent deployment of up-to-date technology … freed humanity from hard manual labor.  

However, socialist agriculture also supported the class of “little” farmers and revolutionized the class balance within a region previously defined by old feudal land relationships. These transformations were the result of land reform policies, which transformed even the topos

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138 Krüger, _Zur Ausstellungstätigkeit technischer Museen_, 75.
139 Staritz, _Geschichte der DDR_, 322.
140 Schneider, “PMS Ordner Chronik.” This quote is from a draft of an article later published in 1989.
141 Though Weimar administrators were mostly responsible for the transformations in land legislation after 1918, informal relationships hearkening back to the older patterns lingered. Kuntsche, "Bodenreform in einem Kernland,” 53; van Melis, _Entnazifizierung in Mecklenburg-Vorpommern_.

of East Germany; in 1952, state administrators broke up old provinces into fifteen districts, including the new Bezirk of Schwerin.¹⁴²

Highly productive agriculture was a constant need and problem for the nation. The severe shortages that many East Germans experienced after the war were a none too distant memory. In the immediate postwar period, the majority of workers spent a significant part of each day procuring goods on the black market, and a portion of every month in the countryside searching for food.¹⁴³ Consistency was also crucial in a centralized economy, since other sectors of the nation depended upon the regular production of regions like Schwerin. However, the party had limited incentives to offer agricultural workers. Since monetary or other rewards were out of the question, psychological and emotional motivational strategies were among the only means available. When crops failed in 1971, for example, ideologues increased mass cultural propaganda.¹⁴⁴ The local Ministry of Culture therefore regularly monitored the region’s economic productivity.¹⁴⁵

Taking part in the cultural efforts to encourage productivity in the GDR, the agricultural displays of the PTMS contained a typical mix of statistics and triumphalism modeled by the “Hennecke activist-movement” that followed the war. Following in the footsteps of a Soviet model, Adolf Hennecke rocketed to fame for achieving 387 percent of his coalmining quota on 13 October 1948, became a “hero of socialist labor,” and tried

¹⁴² Staritz, Geschichte der DDR.
¹⁴⁵ Regarding production statistics, one functionary wrote, “I believe that these facts alone show us the kind of responsibility that we cultural propagandizers [in der Bereich der kulturellen Massenarbeit] carry for agricultural production,” see Ibid.
to start a national trend. Museum displays trumpeted technological innovations that could, like Hennecke, lead to incredible increases in GDR productivity. One such technology was the reaper-thresher (Mähdrescher), no mere machine but an all-in-one "high-performance machine system" that combined the functions of reaping, threshing, cleaning, and transportation. This technological hero was capable of processing twenty-five different types of crops, with reportedly good results "even with damp grain or straw," and could "truly" be operated by one person. Visitors learned that five Mähdrescher would harvest 1,000 hectares in ten days and make 3,600 metric tons of cereal ready for market. In terms of the multiplication, the reaper-thresher was certainly progress, but for those who did not reach this conclusion, a little help was provided. Sometime after 1979, the Mähdrescher model acquired a logo with the word Fortschritt, or progress, against a head of wheat.

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146 Spurred by the crisis in coal reserves, the story was that Hennecke went above and beyond his allotted or expected productivity in dedication to the needs of the nation. The Soviet Military Administration in Germany (SMAD) broadcasted his achievement in the hope of inspiring similar efforts around the country. Unpublicized, however, were the ways that officials rigged the achievement; it took several days of prior preparation in order for Hennecke's feat to happen. The event also occurred on the first anniversary of Order 234, a SMAD decree that implemented Soviet-style labor relations, which included everything from extra rations for "more productive" workers to the introduction of piecemeal labor. Suspecting a set-up, most of Hennecke's peers around the nation doubted that similar results could be achieved on their part, even if they were inclined to try. Kopstein, "Chipping Away."

147 Polytechnisches Museum Schwerin, "Der Mähdrescher - ein hochleistungsfähiges Maschinenystem," TLM PMS Ordner 104 Photo #F21. Katherine Pence notes the penchant for multifunctionality in the distinctively "socialist" household product. Purimix, for example, not only vacuumed and waxed, but with another attachment to the motor became a mixer and food processor, Katharine Pence, "'A World in Miniature': The Leipzig Trade Fairs in the 1950s and East German Consumer Citizenship," in Crew, Consuming Germany in the Cold War, 25.

148 However, access to wonderful machinery like the museum's Mähdrescher was not the norm. For instance, wet conditions meant that 70 percent of the harvested weight of old sugar-beet harvesters (manufactured only in Hungary per COMECON trade agreements) was dirt. They were still in operation in 1990. Ingofig Vogeler, "State Hegemony in Transforming the Rural Landscapes of Eastern Germany: 1945-1994," Annals of the Association of American Geographers 86, no. 3 (1996).

149 Polytechnisches Museum Schwerin, "Der Mähdrescher - ein hochleistungsfähiges Maschinenystem."

150 The model without a sticker can be seen in Polytechnisches Museum Schwerin, Hinweise zur Durchführung.
Technological productivity, however, involved more than machinery. It was a logical process and system that included human behavior, an aspect that the museum’s section on land reforms addressed. In what was perhaps its least interactive section, the PTMS became assertively didactic about the superiority of socialist implementations of technology. Land distribution in the past was unfair, as the display “The Road from Junker Estates to Socialist Large-Scale Agriculture” explained. According to the exhibit, 1.8 million hectares had belonged to 6,307 Junkers, a land-owning class with mostly East Prussian roots, compared to the more than half-million small- and medium-scale farmers who only possessed 2.6 million hectares. Land reforms under socialism completely overturned the situation, and made almost all land available to small- and medium-scale farmers. Thus, instead of a minority owning the majority of land, “9009 cooperatives manage[d] approximately 90 percent of all cultivatable land” in the GDR. For those who might have been unclear as to the moral of the story, the museum was very direct:

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152 Ibid.
with land reform, "[t]he land that Junkers robbed from the farmers during serfdom and capitalism was returned to its rightful owners."\textsuperscript{153}

The museum's presentation of land redistribution and other reorganizations showed the measures to be not only more just, but also more productive. The inherent productivity of the system was made clear through representations of the socialist cooperative as the pinnacle of a centuries-long development in agricultural practices and tools. Dioramas like "The Historical Development of the Field System Practices in Agriculture" told the tale of the "fight against field exhaustion" beginning in 3000 B.C.E.\textsuperscript{154} Visitors could follow progressions that leapt over millennia, and end with "The Creation of Agricultural Cooperatives (LPG) in the Bezirk Schwerin." In this display, one learned that the growth of cooperatives and greater percentage of land use contributed to an ever-growing Gross National Product for the GDR. From 3.658 billion marks in 1950 and 7.151 billion in 1960 to 13.14 billion in 1970, the exhibit proudly proclaimed that technology resulted in an overall increase in the GNP of 359.1 percent.\textsuperscript{155}

Other exhibits of the PTMS simply bombarded the viewer with favorable numbers, emitting the grand tales of history.\textsuperscript{156} Either way, the main point was to show what the museum called "basic principle of intensification." In spite of the quasi-scientific language, intensification meant simply that production multiplied, while the expenditure

\textsuperscript{153} Polytechnisches Museum Schwerin, "Die Änderung der Besitzverhältnisse auf dem Lande durch die Bodenreform (Mecklenburg)," TLM PMS Ordner 104.
\textsuperscript{154} Polytechnisches Museum Schwerin, "Historische Entwicklung der Feldbausysteme in der Landwirtschaft," TLM PMS Ordner 104.
\textsuperscript{155} Polytechnisches Museum Schwerin, "Bildung der LPG im Bezirk Schwerin," TLM PMS Ordner 104.
\textsuperscript{156} As did another display about "The Main Problems of Agriculture and Principal Ways of Solving Them," in which visitors learned that a single person's year of labor in 1980 produced enough basic foodstuffs for 38 persons, while he could only feed 18 persons in 1970, in Polytechnisches Museum Schwerin, "Die Hauptaufgaben der Landwirtschaft und die Hauptwege ihrer Lösung," TLM PMS Ordner (103).
of labor and cost of production decreased.\textsuperscript{157} With depictions of regular increases in production expressed in technical terms, the museum tried to make productivity under socialism assume the status of scientific, rational law.

\textit{Jugendweihe} (youth confirmation) sessions further emphasized that the terrific results of land reform and agriculture were specifically socialist, meaning both anti-capitalist and voluntary, cooperative efforts on the part of citizens for the benefit of all society. Attendants of the class learned that the fertility of the land was “above all... the result of the long-term, systematic, and diligent work of men.”\textsuperscript{158} Poor fertility or soil exhaustion, on the other hand, was purportedly “often the result of capitalistic economic structures and practices in production.”\textsuperscript{159} Evidence of bad capitalist “soil practices” was a little far flung; in one example, the museum compared the GDR’s use of herbicides to the USA’s destruction of Vietnam, which “[made] three million hectares of land unfruitful as well as destroy[ed] the indigenous plants’ thereon.”\textsuperscript{160} Mostly, however, the \textit{Jugendweihe} sessions stressed the goodness and necessity of collective agriculture for a communal economy.

If the displays were to be believed, the process of land reform was voluntary, but it was, in reality, a very painful experience for the region around Schwerin more than any other in the nation.\textsuperscript{161} Museum exhibits told onlookers that the agricultural collective not

\textsuperscript{157} Ibid.
\textsuperscript{158} Polytechnisches Museum Schwerin, \textit{Hinweise zur Durchführung}, 8.
\textsuperscript{159} Ibid.
\textsuperscript{160} Ibid.
\textsuperscript{161} With 54 percent of arable land (46 percent of all land) under target, the province of Mecklenburg-Vorpommern (to which Schwerin belonged) was the “heart” (\textit{Kerngebiet}) of land reform policies, Kuntsche, "Bodenreform in einem Kernland," 52. Other works on GDR land reforms include Arnd Bauer, "Die Bodenreform in der Sowjetischen Besatzungszone in vergleichender und beziehungsgeschichtlicher Perspective: Einleitung," in Bauer, \textit{Junkerland in Bauernhand}; Jonathan Osmond, "From Junker Estate to Co-operative Farm: East German Agrarian Society, 1945-61," in Major
only realized Lenin’s vision of collectivization, but also was a “voluntary unification of the farmers” – a quote taken from the national constitution. Special festivities celebrating the occasion of the 30th and 40th anniversaries of the land reform took place in the museum as well. Despite the rosy pictures and commemorations, land reform across the GDR was instead characterized by violence and corruption, and alienated farmers. For instance, the displayed dispossession of Nazi landowners and Junkers under Soviet administration was a misrepresentation. Conditions under Hitler had already accomplished much of the work, with at most 2,351 out of 8,827nobles surviving the period alive. Those remaining in Mecklenburg suffered rapes, death, and destruction at the hands of the Soviet army’s first march. This fate was common among those designated as Junkers and Nazi bosses, which created tragic results when politicians and soldiers conflated these offenders with other independent farmers (like Grossbauern, or the equivalent of kulaks). Moreover, former Nazi members had survived, and sometimes remained in positions of power.

162 Polytechnisches Museum Schwerin, "Zwei Wege der Landwirtschaft," TLM PMS Ordner 104. At the 1952 Party Conference, Ulbricht maintained “I explicitly underline the absolute voluntary principle in the organisation of such co-operatives and point out that the use of any compulsion for the peasants in this question is impermissible. Comrade Lenin himself pointed out that one cannot introduce communal working of the land through decrees and laws,” from his “Bildung landwirtschaftlicher Produktionsgenossenschaften,” Die Bauernbefreiung, 291 as quoted in Osmond, "From Junker Estate to Co-operative Farm,” 139.
163 LHAS Z19/97:3, "Fachberichterstattung (Statistik)."
164 Naimark, The Russians in Germany, 142-43.
165 Ibid., 85-86. To note this does not attempt to “excultate” Germans in the morass that was Soviet-German relations, as Naimark explains in his work.
166 Ibid., 143.
Land reform actually showed the coercion and severe discord present in rural society despite proclamations of voluntary cooperation. In 1960, agents forced all farmers in the GDR into collectives using threats and violence, declaring Schwerin "fully" collectivized as of March. Yet the fact of collectivization was no guarantee that farming practices had actually changed, since farmers continued to resist. Machinery itself was part of intimidation practices: local functionaries would limit access to much needed agricultural machinery as a leverage device to "persuade" remaining independent farmers to collectivize. Among farmers, divisions between newcomers

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167 Osmond, "From Junker Estate to Co-operative Farm," 145; Staritz, Geschichte der DDR, 190.
168 Ross, Constructing Socialism, 63, 119-20.
169 Ibid., 111 and 119; Osmond, "From Junker Estate to Co-operative Farm." The policies in East Germany, however, were vastly different from the terrorizing and violent agrarian policy of the Soviet Union. In Patrick Major's opinion, "Indeed, agrarian policy might be counted one of the few successes of the GDR," Major, "Introduction," 9.
and established hands were unmistakable. Mecklenburg and Vorpommern were the recipients of over a million refugees and resettlers after 1945, doubling the size of many villages. While the new policies formally favored novice farmers (Neubauern), their integration into the province was limited; 39,000 families received only 34 percent of the fruits of land redistribution though resettlers made up half of the population. Native farmers may have suffered discrimination and derision for their past Nazi affiliations, or the loss of their possessions, but there were often no resources available for new farmers to build, leaving them in extremely impoverished circumstances.

Finally, despite the representations, productivity was not necessarily high. Though the redistribution of land to farm laborers and refugees may have been ideologically correct, almost every agricultural expert opined that breaking up the large estates would hurt rather than help production in a situation where citizens desperately needed sustenance. Palpable losses in production were indeed the result of redistribution, and were caused not merely by mismanagement or the dearth of equipment and resources, but also by the flight of farmers to the West in response to reform measures. Even if the later increases in production that the museum showed were accurate, the PTMS did not present agricultural statistics dating from before the war, which no doubt would have jarred the progressive picture. Observers noted that, in the case of industrial production, both Soviet reparation demands and the consequent lack of

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170 Kuntsche, "Bodenreform in einem Kernland," 55.
171 Ibid., 65.
172 Naimark, The Russians in Germany, 144.
173 Ross, Constructing Socialism, 66.
incentive to work were responsible for a 50 to 70 percent drop compared to pre-war levels; similar circumstances in agriculture were therefore likely.\textsuperscript{174}

Ultimately, the museum’s exhibits justified the measures taken, like land reform, through an argument of high yield. They also focused upon technology’s starring role in the agricultural drama. However, the displays grossly belied the farmers’ experience of land reform in what Mecklenburg President Wilhelm Höcker once called the country’s poorest region, and presented a case contrary to their aims.\textsuperscript{175} Land reform disproved the myth of self-motivated or “voluntary” socialism, since people had been unwilling followers of party directives. By bringing a disputed topic into their pedagogical space, the museum also raised the question of unity between party and populace, an ideal that was in fact undergoing official revision. In 1971, the Eighth Party Congress abandoned the notion of a socialist human community (Menschengemeinschaft), since it unhelpfully “overestimated the closeness of the various social classes and strata”; that was at least the explanation of Kurt Hager, SED Secretary for Culture and Science and the GDR’s chief ideologue.\textsuperscript{176} At bottom, collectivization questioned the very ability of planners to ensure the realization of a harmonious, socialist society. In justifying party policy, the museum contradicted its attempts to foster a self-motivated populace and showed instead that productivity was not the means to a better future, or even the sign of a happy people, but an end in itself.

\textsuperscript{174} Naimark, \textit{The Russians in Germany}, 158-59, 94-96.
\textsuperscript{175} Kuntsche, "Bodenreform in einem Kernland," 65.
\textsuperscript{176} Woods, \textit{Opposition under Honecker}, 6.
Clearing contradictions after the fall of the GDR

In retrospect, PTMS educators tried to transform technology and labor into an epic project, the scope of which was captured in a poem that greeted visitors at the entrance:

Man is made good and noble through labor
Through that which he has achieved, that which he has created
Talent and abilities, his genius --
He manifests these in labor
Yes, in labor
Lies the immortality of the human species.\(^{177}\)

Waxing eloquent on the nobility of work, museum personnel attempted to show technology's value for individuals and society. However, the narrow choices provided by the exhibitions gave lie to the museum's expressed goal of shaping independent personalities and, moreover, conflicted with rationales for supporting the Party.

History exhibits of the PTMS, for example, tried to compel viewers into becoming productive participants of society by fostering a sense of responsibility to nation, arguing the superiority of socialism to capitalism, and explaining the "laws" of production and the world. Regarding human agency and autonomy, the museum did indeed show that present-day society was radically different from before, and that humans were responsible for all revolutions. At the same time, the museum represented social transformation as inevitable, though depictions more closely resembled party strictures than the unfolding of certain laws. With descriptions of evolutionary processes and ostensibly innate human characteristics, the limited range of which included diligence and anti-capitalist sentiment, the PTMS ran counter to its stated ideals of individual development. Furthermore, in their effort to underscore the infallibility of the

\(^{177}\) Polytechnisches Museum Schwerin, *Hinweise zur Durchführung*. 
state, PTMS exhibits that emphasized the inevitability of socialism also undercut motivations for productivity, for why would one work if the future was indeed assured? Given the hollow tenor of emphatic guarantees, it was unsurprising that the GDR had continual problems in motivating an aggressive work attitude. Thus, the museum would not solve the conundrum of psychologically fostering a present-minded, independent ethic of responsibility by appeals to reason.

The exhibitions on energy technology addressed the task differently, aiming to create confidence in the socialist project on the part of visitors, but also an unquestioning faith in the party’s abilities. In spite of the museum's avowals of egalitarianism and anti-elitism, energy exhibits used scientific and technological virtuosity as an argument for the primacy of the party and its intellectuals in all areas of society. Museum personnel could therefore overlook local uncertainties about whether technology could be controlled, such as nuclear power, and focus upon its productive potential. Yet even as the museum reinforced the supremacy of scientists – or rather, the party – it inadvertently provided the means to question their leadership. Depictions of energy problems in combination with a persistent lack of consumer goods implied that cultural functionaries like Krüger, and the planners above them as well, were bereft of the very wisdom they professed to have. Instead of conscious, or critically thinking, socialist personalities, the PTMS desired in the end more reflexive responses of obedience.

Energy displays rationalized the supremacy of party leadership, and therefore underlined distinctive roles in society, but the exhibitions of agriculture maintained that party and society were one harmonious whole. Exhibitions aimed to impress visitors with the supreme rationality of collectivization and, consequently, the partnership
between state and society that implemented them. Despite walls of upbeat productivity statistics, and repeated boasts that land reform demonstrated successful, rational cooperation between party and nation, museum exhibits were a reminder of the coercion that many farmers suffered. By justifying land reforms, the museum contradicted its own argument that technology assured social liberation. Collectivization was a policy whose forcible implementation not only struck at the heart of the social ideal, but indeed epitomized the absence of volunteerism, a personality trait that the museum hoped to inspire.

In the end, the argument running throughout the museum during the 1970s and 1980s that students could possess a kind of “directed independence” was circular, if not sheer assertion or tautology. Theoretically, the sign of true socialists was not only their “conscious,” but also “happy and worthy” lives, and would be reflected in their willingness to rush to the front line of Cold War conflict. Yet the party alone defined what a conscious, happy, and worthy life meant. This left no room for an individual, let alone a dissenter: dissent itself was antagonistic to the allegedly harmonious democratic state that socialism had already achieved. However, the continued rumblings of dissent among young people and the populace at large, even when muted, showed that GDR educational policy was not working.  

Indeed, by the end of the 1980s, educators in the PTMS and across the nation had to face increasingly apparent discrepancies between the reality and ideals of socialism. The growing instability of the institution and the nation was literally evident in the PTMS: the castle structure was crumbling, causing a prized computer to suffer water

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damage. The literal disintegration of the building was rivaled only by the institution’s political situation, in which personnel during the tumultuous days of 1989 could no longer suppress the contradictions within their relationship to the public. Against the backdrop of the GDR’s demise, museum staff themselves broke loose from political constraints, and the local population made their sentiments about the museum’s ideological role clear.

Because of failing health, Krüger had given up his post as head of the museum in 1987. Perhaps it was just as well, since the political transformation that took place in several years’ time would demand a reorientation more radical than anything Krüger could have imagined. Taking his place after a string of acting directors was Werner Zielke, who tried to keep up some of Krüger’s principles. At least, he also wrote about the necessity for furthering a “creative independence (Selbsttätigkeit)” in the viewer, thereby maintaining the pedagogical line of others in the field during the late 1980s.

He did not appear, however, to engender the same sympathy as Krüger had from his colleagues. In the days following March 1990, Zielke’s colleagues ejected him from his position with a vote of 18 to 3 proclaiming no confidence.

Museum staff had ties to the party, and to most of them the fall of the Wall came as a surprise. “H,” who by November 1989 was ready to give up his party membership,

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179 In 1989, for example, 55 percent of GDR streets and roads had damage, with 18 percent “barely passable,” Staritz, Geschichte der DDR. On the condition of the museum, see Schneider, "PMS Ordner Chronik."

180 Schneider, "PMS Ordner Chronik."; [Schneider?], "Chronik (Kopie) des Museums 1959-1997."; Krüger stepped down from the Bezirkskabinette in 1984, Krüger, "Zur Vorgeschichte."


182 Schneider, "PMS Ordner Chronik."
recorded his experiences of the last days of the GDR.\textsuperscript{183} On the third of the month, “H” wrote, “today is a particularly special/strange day... it is my first day without party! (Ich bin den ersten Tag parteilos!)”\textsuperscript{184} By considering his defection to be a leap, when in fact he joined a growing number of individuals who were also “without party,” “H” revealed the great extent to which party membership had grounded his existence.\textsuperscript{185} Observing the demonstrations and upheavals around Schwerin as well as across the nation, the chronicler wrote with astonishment and incredulity: “What days!!! Everything is indeed completely changing! [...] The opening of the borders hit me like a bomb. Is it now truly the \textit{Wende} (turn of things)?”\textsuperscript{186}

The demand for creative self-motivated behavior was difficult to maintain as the walls crumbled around museum staff, but they struggled to justify the PTMS’s continued existence. Yet members of public used their own new freedom to divorce themselves from ideological education and, thus, avoided the museum. In one summer drawing competition entitled “Children experience technology in the polytechnical museum,” only a pair of siblings showed up to participate. Whether it was the vacation period, a lack of promotion, or just an absence of interest – a newspaper article implied the latter – the

\textsuperscript{183} In order to protect the diary writer, the “H” is used.
\textsuperscript{184} Ibid.
\textsuperscript{185} To be without party (parteilos) was to be part of an actual political category, the roots of which stemmed from at least the Weimar Republic. American political scientist James K. Pollack, Jr. discussed the political power of Parteilosigkeit’s ostensible “nonpartisan” or apolitical nature in the 1928 elections, when splinter parties actually described themselves as “parteilos,” see Pollack, Jr., James K., American Political Science Review 23, no. 4 (1929). In the GDR, political activism became a sign of antifascism, as a departure from the presumed inactivity of many citizens under Hitler. Thus, to be without party was unacceptable – as those rallying for the CDU in the Soviet Zone of Occupation proclaimed: “Those who remain outside the parties during the emergencies of their people are unworthy of the honor of being a citizen!” (\textit{Wer in Notzeiten seines Volkes parteilos bleibt -- ist unwert bürgerlicher Ehre}). It was not impossible, however, van Melis, \textit{Entnazifizierung in Mecklenburg-Vorpommern}, 144.
\textsuperscript{186} The degree of staff political involvement will never be completely known given the internal destruction of documents, “Protokoll über die Vernichtung der gewerkschaftlichen Unterlagen [26.10.1990],” Schneider, “PMS Ordner Chronik.”
museum was certainly in trouble. Another attempt to prompt interest in the museum among children later that fall, which included the possibility of a free trip to Hamburg, also failed. The local paper summarized the pedagogical effort on "Energy in the Schwerin Museum" bluntly: "Museum quiz without resonance: school children continue to show little interest." Without the continued Jugendweihe or educational structure to underscore the ideological significance of a museum visit, people apparently found other things to do. At any rate, there was no longer any need of lessons that taught the potential of technology for socialism.

A former member of the staff, Rüdiger Knoll, became director after unification and led the attempts to reorient the museum according to the times. According to the prospectus, the PTMS was now "for the people," or more specifically, the museum would "understand itself as an institution of the public, for the public." The museum's new profile would focus on three areas permitted by the limits of its collection, but defined afresh: energy, the environment, and information and communication technology. Without having to bolster socialist productivity, the new exhibits could give different weight to the "Nature-Humanity-Technology" equation. Though past ideals had assumed technology to be harmonious with society, the museum now recognized hostile aspects

190 The museum created an ecological tradition for itself. Though it was not ecological in today's sense, museum staff took past references to nature and the environment and argue that they proved the museum's long commitment to biological conservation. Even in his memoirs, we find that Krüger felt that the museum always related to ecological points of view, see Krüger, "Zur Vorgeschichte," 11. A fascinating account of the changing depictions of nature in museums over time is offered by Andrea Plamper, Von der Kulturlandschaft zur Wunschlandschaft: Die visuelle Konstruktion von Natur in Museen (Münster: Waxmann, 1998).
more fully. For example, museum personnel kept the model of the atomic reactor, but explained both its economic advantages and its potentially unsafe aspects.\textsuperscript{191} Staff intended to gear the entire museum towards reconciliation efforts. "These three guiding concepts [of energy, environment, and communication]," read the prospectus, "will flow though the newly conceptualized exhibition, like a red thread; they will attempt to bring technology closer to humans, but at the same time represent the problems that result from scientific-technical progress and human development, both globally and nationally."\textsuperscript{192}

Although the museum tried to refashion itself to the new political sensibilities, it could not nor did it care to discredit its entire past. The staff was still positive about technology and felt that some aspects of the past institution could be carried over, such as its pedagogy of active engagement or emphasis on the problem-solving capabilities of technology. The assumedly neutral principles of education and technology were important parts of their pitch to become the technology museum for all of northern Germany. In the view of the personnel, the PTMS was "the only technical museum in northern Germany, which show[ed] technology in concrete and creative experiential ways for the visitor."\textsuperscript{193} Staff also argued that the museum deserved support precisely because it offered "scientifically-determined, possible solutions in connection with the projection of already known and expected problems of world civilization" and those local to Mecklenburg-Vorpommern.\textsuperscript{194}  

\textsuperscript{191} My own photo in 2004.  
\textsuperscript{192} "Nächstes Jahr Auszug aus der Orangerie: Zur Zukunft des Polytechnischen Museums Schwerin," Norddeutsche Zeitung, around 21 May 1990, found in Schneider, "PMS Ordner Chronik."  
\textsuperscript{193} Technisches Landesmuseum Schwerin, "Langfristige Grundorientierungen für die Entwicklung des Polytechnischen Museums Schwerin."  
\textsuperscript{194} Ibid.
Whereas, before, active learning and problem solving were part of a socialist ideological framework, now they and the museum would benefit a democratic society. The new institution was therefore no less ideological or aspiring in terms of the technological future. When the museum gained a new name on 20 September 1991 that reflected the new political realities, its reformulated aims were as eloquent as those of its former life. Mecklenburg-Vorpommern’s State Museum of Technology in Schwerin (Technisches Landesmuseum Schwerin) was now prepared to deliver what it – and all of socialism – had implicitly promised all along. Moving away from the old rooms and philosophy, the new charter of the museum read: “As a public and culturally educational, leisure and tourist institution marked by the scientific-technological character of the state of Mecklenburg-Vorpommern, the content [of our museum] aims at … pedagogical work with the visitor in the service of our free, democratic, social and just governance, [and making] a contribution towards the achievement of independently thinking and socially conscious, responsible humans.”

From the perspective of the public and the authorities – albeit in completely opposite ways – the mix of education, technology, and “democratic socialism” was not what it promised to be. The inconsistencies of PTMS education arose out of a larger problem with centralized socialism in the GDR witnessed in the departure from Ulbricht’s New Economic System (NES) policies. The realization of a technologically advanced socialist society was what the party’s authority over GDR citizens rested upon,

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195 Schneider, “PMS Ordner Chronik.”
even though they may never have been entirely convinced of the prospects in the first place. While the GDR’s legitimacy depended upon the party’s ability to deliver its promises, fulfillment also desperately required the active participation of a reluctant population. Following the initial open parameters of NES, however, the degree of appropriate participation was in dispute. Honecker reasserted the primacy of party over all society – including scientific leadership – in 1971, and “pleas for creative initiative” fell on deaf ears thereafter, as the ousting of dissident Rudolf Bahro proved. What the party, and the museum, sought was a “really existing socialist,” to use Honecker’s pragmatic turn in socialist policy: no longer starry-eyed, yet inexplicably believing in (a more muted) socialist dawn to come.

The utopian and ideological aspects of both the museum and GDR education were fairly obvious. Inculcation became the key: a Volk armed both with knowledge and an ethic of responsibility, much like the PTMS’s productive personalities, would bridge the gap between technological enthusiasm and political obedience. Yet the likelihood of creating this citizenry in the PTMS was slim, since the task was also compromised by a host of dichotomies at work in the GDR and visible in the exhibitions. Historical determinism versus human autonomy, the solutions versus problems of technology, party subjects versus objects – all offered tensions that neither educational authorities nor the SED could afford. However, the struggle to determine the role of both political and intellectual authority in a socialist society involved a query that struck at the heart of socialism: to what extent should an “expert” authority define the terms, tenor, and limits

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of political activity – and indeed the very psychology or character – of its public in a state that ostensibly held their individual and social happiness as the ultimate end?

It was a nation both defined by contradictions and the attempt to overcome or “unify” them, a notion that hearkened back to another age entirely. Though pedagogues of the GDR may not have recognized it, their “unified” socialist school system echoed the terms of orthodox mandarin Ferdinand Jakob Schmidt, who had talked about the “unified, social-humanistic educational objective” of the classically influenced (Gymnasium) educational system.\textsuperscript{199} They were radically opposed in ends, for Bildung elites sought to retain a broadly humanistic education that included Latin and Greek and ultimately preserved educational privilege, while East Germans strove to abolish the divisions of class. Yet the two were similar, since they both recognized the ways that technological industrialization created deep fissures. Their common response was authoritative guidance, which in the East German case could also be insistent to the point of compulsion. In historian Konrad Jarausch’s terms, the GDR was a “form of forced rule not by, but rather for the people.” Put another way, East Germany was a “welfare dictatorship” that expressed its obligations through a blend of care and coercion.\textsuperscript{200}

Rather than a conscious, self-motivated productive personality, the PTMS was more likely to shape someone else entirely. After the fall of the Wall, social scientists of the West gave their own definition of the socialist personality, ranging from sociologist Andrew Arato’s “authoritarian socialist formation,” to psychologists Schoensee and Lederer’s formulation that involved the “wide-spread feeling of paralysis paired with

\textsuperscript{199} Fritz Ringer, \textit{The Decline of the German Mandarins}, 284.
anxiety and fear,” and even a “permanent state of schizophrenia.” However, the resigned, even anti-utopian, person of official optimism described in sociologist Theodor Adorno et al.’s *Authoritarian Personality* from 1950 rings more true. The official optimist was one who “recognizes from the very beginning the overwhelming superiority of the existent over the individual and his intentions, … advocates an adjustment implying resignation with regard to any kind of basic improvements, … gives up anything that may be called a daydream, and reshapes oneself into an appendage of the social machinery.” According to the theory, the more a person was ready to respond to authority, the more he professed his commitment to utopian or ideological thinking, although he had in fact given up his ideals.

Calling upon psychology and the powers of rationality, whether in education or in politics, was a two-edged sword. If the museum advocated technological growth and proclaimed its imminent arrival, it also brought attention inadvertently to the continued material deficiencies of the GDR. Failures across the board in hoped-for technological developments and productivity in the 1970s and 1980s were almost inevitable since, in the observation of Peter C. Caldwell, the “plan” for a socialist future became not a means to results but an end in itself. In fact, the museum’s very presence in a society of increasingly lagging technology placed doubt upon party promises. To declare the goal

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203 Ibid. However, even according to the authors, the authoritarian personality (and those less dominated) still had latent ideals of what a good society entailed.

of rational and critically thinking citizens who still did not question the capability of the planners in charge was a contradiction.\footnote{Baylis, \textit{Technical Intelligentsia}, 19-20, 275.} Perhaps psychology itself provides an apt metaphor for the dilemma. Famous for his experiments upon groups of twins during the Nazi period and forty years thereafter, Gestalt psychologist Kurt Gottschaldt oscillated in his explanations of personality between the opposing factors of genetic heredity and environment as he himself moved from under the governance of Hitler, then Ulbricht, and finally to Adenauer.\footnote{Mitchell Ash, "Kurt Gottschaldt and Psychological Research in Nazi and Socialist Germany."} GDR functionaries certainly had to contend with legacies of 1945 and an even more powerful political environment, quite different from their West German twins, when attempting to combine the vectors of technology, socialist democracy, and education into one unity. The challenge of material circumstances only created more difficulties for overcoming the tensions already inherent in the enterprise.
TOHUWA is top secret. My professor lowers his voice long before he lets this word slip out, Dr. Fettback lowers his little mustache, and Dr. Hinz lowers the corners of his mouth for reasons unknown to me. But I, motionless and attentive among the papers on the desk, I know what it is all about: TOHUWA means nothing less than TOTAL HUMAN HAPPINESS.

The abolition of tragedy: that is what they are working on here.


CHAPTER 3 · GDR MUSEUMS, PART II

The world through a socialist lens: interconnectivity in the Technisches Museum Dresden

Through the eyes of a literary tomcat, East German author Christa Wolf presents a research professor pursuing a formula for human happiness. Rather than an elixir, however, the professor and his colleagues seek a system of human behaviors that will guarantee personal contentment in all circumstances. Vagaries of human life become variables for their anthropomorphically named computer program “Heinrich,” which demands over the course of the tale an ever-increasing amount of sacrifice from the hypothetical test-subject. However, the factors slated for elimination, like creative thinking, begin to encroach upon the very markers of human nature. The story’s conclusion is an uneasy one on two counts. Though the prospect of determining a system for human happiness becomes unlikely, the pursuit nonetheless continues. In fact, it transforms, and the tale suggests that those in power tend to force others ultimately into “bliss” as they define it, impinging on people’s autonomy and very humanity.¹

¹ Christa Wolf, "The New Life and Opinions of a Tomcat," in What Remains and Other Stories (Chicago: University of Chicago Press, 1993), 137. Christa Wolf (1929–), writer, was born in Landsberg (Warthe) (now Poland; in 1945, her family resettled in Mecklenburg). Her first major work was Der Geteilte Himmel (Divided Heaven) in 1961.

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The tale is undoubtedly ironic and humorous, as the mishaps of a team of researchers from the perspective of a housecat would be. Yet Wolf addressed a serious problem: whether the efforts of socialist planners and scientists to realize utopian visions—through data processing no less—were ultimately impossible, if not critically misguided from the start. Their efforts stemmed from assumptions about human development, laws that governed the world, and the belief that individual and social happiness could be uniformly and universally addressed. These suppositions not only grounded the endeavors of Wolf’s fictional characters, but were also at work within a small institution focused on electronic and computer technologies in the heart of Saxony, the Technisches Museum of Dresden (Technisches Museum Dresden, TMD).

Residents of Dresden were in sore need of visions for human happiness after World War II. With the city’s firebombing on 13 and 14 February 1945, Dresden joined a small coterie of cities whose names became synonymous with the most advanced methods in military destruction, such as Guernica, Coventry, Nagasaki, and Hiroshima. British and American bombers decimated 70 percent of the capital of Baroque architecture within hours, and thousands perished in the conflagrations that ensued. Though the chaotic aftermath made precise counts difficult, scholars estimate that between 25,000 and 40,000 persons died. Moreover, many cultural monuments were

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destroyed, as well as the industrial and armament production facilities that were an intimate part of the region’s mining and manufacturing identity.\textsuperscript{4}

Against this background, Dresden’s small technical museum opened in 1966 and strove to make relevant local contributions by addressing grand universals of human life, desire, and aspiration through a focus on electronic technologies. Specifically, the museum showed how a proper, socialist understanding of the world ensured both efficient operation and the realization of utopian ideals like peace and love. Technology and socialism, as illustrated in the museum, would benefit not only visitors’ own lives. In the TMD, helping viewers to acquire a socialist worldview also included an understanding of their impact upon the lives of others on the local, national, and even international levels. In stressing the principle of interconnectivity, or truth of dynamic interdependence, not least among the hoped-for results for museum designers was greater awareness on the part of visitors that each individual effort achieved the larger social project.

While the museum’s notion of an interconnected, universal framework dated from the early modern scientific revolution, it was also informed by recent theories in cybernetics. Originally introduced by the US mathematician Norbert Wiener in 1948, cybernetics melded the worlds of man and machine and provided scientists of all stripes with a new model for seeing the world. A theory of dynamic communication and control through regulatory feedback, cybernetics became fashionable with the beginnings of the computer revolution and, in the GDR, under the technological enthusiasm of first SED

\textsuperscript{4} Rat des Bezirkes Dresden, "Profilierungskonzeption für die Museen des Bezirkes Dresden," 18 February 1974, TMD Ordner Profilierung Museen; Taylor, Dresden: Tuesday 13 February 1945. The council estimated the destruction at 70 percent.
party leader Walter Ulbricht during the late 1960s.\(^5\) It seemed to promise, with the help of advanced computing machines, the efficient steering of society and thereby legitimated the centralized organization of the state in the GDR. Cybernetics also had appealing possibilities to educators regarding the processes of human learning, adaptation and growth.

However, if the prize was the realization of socialism, cybernetics and its dynamic, open structure had an ambivalent relation to an ideological worldview. For one thing, the dynamism of cybernetics challenged the strictures of a consciously planned or organized society. Moreover, educational theorists neglected the part of cybernetic theory that also suggested the inevitable decline of such systems, or entropy. Finally, though museums in the GDR took the project of optimizing communication and education seriously, they still encountered a host of external problems that they could not control, such as access to resources or the pressure of audience feedback on local and international levels. Thus, the Technisches Museum Dresden faced challenges to its universal claims about technology and democratic socialism on a number of fronts.

*The paradox of Abgrenzung and cybernetics for GDR education*

When SED party chief Walter Ulbricht ordered the building of the Berlin Wall in August 1961, the objective was both economic and political. First and foremost, patrolled borders allowed the formation of stable economic plans because the party could depend upon steady growth in the working population. Since the 17 June 1953 uprising,

\(^5\) See Chapter 2.
East Germany had lost a dramatic amount of persons and talent.\textsuperscript{6} Half of the 199,000 to 300,000 émigrés who registered officially in the West were under 25 years old.\textsuperscript{7} However, the success of future economic plans required not merely a young and technologically skilled generation, but one that was loyal and, more to the point, diligent. The effort to create a different national mentality for East Germans was therefore a top priority, and codified by cultural ideologues in the policies of Abgrenzung, or demarcation, from West Germany and other capitalist nations.

The burgeoning of technology meant that East Germans accessed West German culture to a degree that SED party leaders found troubling. It was difficult to isolate East Germans from a world available at the mere click of a button. Western radio and television programs frequently had a GDR audience, despite the party’s attempts to discourage viewing. Besides directing citizens not to watch, initial efforts to block West German programs even included “operations” in which Free German Youth (FDJ) groups furtively reoriented rooftop antennae. Nonetheless, an estimated forty to fifty percent of school children in one official estimate of 1963 tuned in to West German shows (school drawings showed, for example, depictions of automobiles not present in the East). As the number of consumer goods in the GDR increased in the 1970s (a result of SED party chief Erich Honecker’s chief domestic policy), so too did the number of televisions and, therefore, access to Western media. Communication functionaries then accepted the reality of their viewing public, and strove to make their programs more appealing. While

\textsuperscript{6} The uprising of 17 June 1953 began a wave of strikes and demonstrations across the country, emanating from East Berlin, involving over 500,000 strikers and 400,000 demonstrators. The crackdown, which required Soviet intervention, resulted in 51 deaths. See Staritz, Geschichte der DDR, 120-22.
\textsuperscript{7} Rodden, Repainting the Little Red Schoolhouse, 73-74.
many GDR citizens continued to watch and even preferred their own programs, they also numbered West German television as one of their standard options.8

Because rapprochement with West Germany in the 1970s promised even greater cultural exchange, functionaries heightened their efforts to create a sense of difference from the Federal Republic in all venues, including museums. Already in 1968, the GDR’s Council on Museum Issues (Rat für Museumswesen) suggested ways for museums to reinforce antagonism towards their western siblings. A March memo encouraged the support of the “international working class” through representations of the German working class “struggle” and West German connections with imperialism and fascism. By “uncovering” these parallels for the small, but significant, numbers of Western visitors – if not in fact for the home audience – the ministry argued that “museums strengthen[ed] knowledge of the dangerousness of imperialists and militarists, especially among the [visiting Western] youth, and they further[ed] the process of growing democratic strength in West Germany itself.”9 Democracy meant socialism as found in the GDR, of course, and after 1972 border treaties guaranteed more visits by West Germans, Eastern functionaries became more insistent about the need to maintain cultural difference. Meetings focused on the problem of “more strongly support[ing] the progressive, democratic energies in West Germany,” in the words of Gerhard Thiele, member of the Museum Sector in the Ministry for Culture. Given the expected increase

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8 By 1980, a West German researcher estimated that eighty percent of East Germans had televisions, of which eighty to ninety percent tuned into West German programs. Mark Fenemore, “The Limits of Repression and Reform: Youth Policy in the early 1960s,” in Major and Osmond, The Workers' and Peasants' State; Woods, Opposition in the GDR; 9; Claudia Dittmar, "GDR Television in Competition with West German Programming," Historical Journal of Film, Radio and Television 24, no. 3 (2004); Michael Meyen and Ute Nawratil, "The Viewers: Television and Everyday Life in East Germany," Historical Journal of Film, Radio, and Television 24, no. 3 (2004).

in West German visitors, "it was clear to everyone that we must make the frontlines in ideological areas more clear and cannot give any room to this idea of ‘intra-German relationships within the frame of a unified German Kulturnation (cultural nation)’ being pushed by the Bonn government."\(^{10}\)

Functionaries stressed the cultural divide because they found the underlying principles within Western, and West German, civilization to be antithetical to those they wanted to instill in citizens of the GDR. Günter Wehner, a head assistant at the Museum of German History (Museum für Deutsche Geschichte), found the very categories of Western museums to be insidious. Even assuming a "modern industrial society," as FRG museums did, undermined a socialist perspective on life. For Wehner, the category was equivalent to "modernized anticommunism," because socialism became a mere "variant of ‘industrial society’" instead of the progressive and developmental step that socialist society in fact was.\(^{11}\) In support of his argument, Wehner pointed to West German art historian Karl-Heinz Esser’s conclusion that "no one takes seriously anymore the notion that it is possible to derive generally applicable rules and laws from history, or that our society and future would be determined through them."\(^{12}\) Esser’s assertion contradicted law-based socialism at its core, and in the view of Wehner and his fellow museologists, also proved the West’s own ideological dispositions.

However, Abgrenzung did not mean a withdrawal from the international sphere, because the GDR leadership wanted to make its own inroads into West German and

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\(^{10}\) Gerhard Thiele, Letter to Plavius, 25 January 1972, BA-SAPMO DR 1/7426.


Chapter 3

international politics. On the more extreme end of efforts was the covert support of radical groups in West Germany, an attempt to realize the *Communist Manifesto*’s ideal of international revolution.13 Less extreme endeavors included East Germany’s pursuit of recognition on the world stage, a prize that only an international community could grant. In other words, East German policy would not cordon itself off from the West entirely, because GDR politicians believed their legitimacy was tied intimately to international standing. The party was therefore completely uninterested in the policy of autarky, or economic self-sufficiency, that Hitler had fastidiously pursued.14 Both Ulbricht and Honecker persistently sought a World War II peace treaty and the GDR’s entrance into the United Nations as a sovereign nation. After decades of geopolitical machinations in the crossfire of Soviet, NATO, and West German interests, both halves of Germany became UN members in September 1973.15

The search for legitimacy meant that the GDR sought a great deal of recognition, interaction, and achievement on the world stage in many areas, especially technology. Sports and the arts were important, but technology had special meaning in the post-1945 era. Thus, party organizers used the annual spring and fall Leipzig fairs – the oldest venue of their kind in Germany – to show the world the best examples of GDR technology.16 Under Ulbricht’s technological enthusiasm, the quest for technological superiority became especially pronounced in areas of computing research. Honecker even surpassed the early eagerness; it was almost inconceivable at the onset of the 1970s

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14 Ian Kershaw, *The Nazi Dictatorship*.
16 Katharine Pence, “‘A World in Miniature’: The Leipzig Trade Fairs in the 1950s and East German Consumer Citizenship,” in *Crew, Consuming Germany in the Cold War*; Stokes, *Constructing Socialism*. 
that the author of "really existing socialism" would acquire a passion for technology. However, the formerly pragmatic Honecker became a technological cheerleader one decade later, demanding the GDR’s pursuit of the one-megabit chip and other landmark computing efforts. Programs for consumer goods and computational technology were neither as centralized, coordinated, or ideologically consistent as party functionaries would have liked, but they nonetheless reflected a national policy commitment to all areas of technology.

Part and parcel of the computing revolution was the new conceptual model of cybernetics. Moreover, the system of cybernetics appeared to capture aptly the increasing complexity in the world beyond computers, and provide a way to manage it as well. Cybernetics went further than the mere theorization about the ways that systems, computerized or human, communicated with one another. In the words of the French pioneer Louis Couffignal, cybernetics was also "the art of assuring efficiency of action," and the socialist party wanted nothing more than an efficient means to socialism. Correspondingly, the 1965 Education Act codified not only the importance of a polytechnical education, but also stressed the importance of mechanization, automation, and the sciences of electronics and cybernetics. In recognition of the ways that science and technology were defining modern life according to "objective laws of social development," the Act was supposed to exemplify the merging of education with the technological "buildup" of socialism. Comprehensively and without contradiction, then,

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the "scientific-technological revolution" and advances in education were to come together under the auspices of the Party.²⁰

Cybernetics, however, had a fraught relationship with socialist politics. Initially, ideologues in the USSR defined it as a "reactionary pseudo-science" and "an ideological weapon of imperialist reaction."²¹ Rehabilitated after Stalin's death in 1953, cybernetics enjoyed its heyday in the GDR during the 1963-1969 period of Ulbricht's New Economic System (NES) and Economic System of Socialism, but fell out of favor by the end of the decade.²² Because it involved steering and control mechanisms aimed at the attainment of a specified goal, cybernetics provided an ideal metaphor for the operations of the East German state. Furthermore, because cybernetics also stood for a self-regulating and dynamic system, or the ability to react to unforeseen changes, it seemed to offer socialist planners a solution to oft-encountered snafus. Planning problems in the GDR were frequent, as production shortages during the 1960s attested, despite official assertions of the party's comprehensive and conscious control. In fact, total control was part of the problem: local actors could not react independently to situations when external resources failed. In experimental breathing room that NES allowed, figures like philosopher Georg Klaus, legal theorist Uwe-Jens Heuer, and economist Gunther Kohlmey delineated the possibilities of cybernetics to address these challenges for socialist philosophy, law, and economics. However, their research, and indeed the principles of cybernetics, implied

¹⁹ Rodden, Repainting the Little Red Schoolhouse, 128.
²¹ For more on NES, see chapter 2.
ultimately that an over-centralized system was detrimental. This conclusion, however, challenged the very premise of party control over society.\textsuperscript{22}

Key to the downfall, though not elimination, of cybernetics in socialist political theory was the return to hard-line party politics following the “Prague Spring” of 1968. Alexander Dubček, the new chairman of the Communist Party in Czechoslovakia, had permitted liberalizations in the public sphere that many leaders of the Socialist Bloc found threatening.\textsuperscript{23} The military intervention of the USSR in August brought Dubček’s efforts for “Socialism with a Human Face” to an end, and experimentation with socialism across the Bloc largely stopped. Though resulting policies discouraged further developments in cybernetic and socialist thought, the legitimacy of cybernetics in explanations of communication and related processes still persisted, if precariously.\textsuperscript{24}

One arena in which the metaphorical power of cybernetics would be difficult to override, or expunge completely, was education. Cybernetics corresponded well with educational theory and museum strategies in particular, giving rise to a number of articles from the Working Group on School and Museum Issues (Arbeitsgruppe Schule und Museum). In the group’s journal of 1969, for instance, leading museum pedagogue Kurt Patzwall, a principle in the School und Museum group, elaborated how cybernetics provided a model for human emotional and psychological “systems.” Patzwall’s article, “The museum exhibition from a cybernetic point of view,” maintained that every exhibition could be characterized as a system or “comprised of an entirety or complexity

\textsuperscript{22} Caldwell, \textit{Dictatorship, State Planning and Social Theory in the GDR}.
\textsuperscript{23} Alexander Dubček (1921-1992) was educated in the Communist Party College in Moscow in law. He was the First Secretary of the Central Committee for the Communist Party of Czechoslovakia from January 1968-69, expelled from the party in 1970, and a supporter of the Velvet Revolution in 1989.
of elements and pieces [that] contained a structure, realized a function, and either gave or processed data."\(^{25}\) A visitor, in his schema, was another system, and an analysis of interaction between the two could provide insight into the optimal transmission of information from one to the other. Fatigue, for instance, was expressed in terms of "system overload" speak:

That the visitor, when viewed cybernetically, represents a dynamic, closed system of rules – in addition to an ability to increase and develop oneself (i.e. "self-organizing system"), [a visitor is] a system possessing the ability to maintain stability in the face of environmental factors through a regulating effect (in short, a self-stabilizing, self-regulating system). He can, for example, when exhausted (though overloading) "turn himself off."\(^{26}\)

By abstracting the visitor's tiredness into a feedback signal, cybernetics gave educators an important conceptual tool for effective work.

However, the degree to which the cybernetic model of education actually gave more control to educators was unknown. Ilse Jahn, head of the Museum of Natural History, pointed out the puzzle in her reflections on cybernetic possibilities titled "On an attempt to program exhibition sections."\(^{27}\) In her 1969 essay, Jahn echoed the desirability for programming methods in museums as ways not only to awaken interest in the viewer, but also to determine the different learning temperaments and desires of subjects. A museum should not only seek out intellectual methods, in her opinion, but


\(^{26}\) Ibid.: 61.

also emotional and artistic or aesthetic means to convey information.\textsuperscript{28} Yet Jahn also recognized the greatest obstacle to this goal in museums, in contrast to other forms of instruction: the dearth of authentic “feedback.” Feedback was “the most important part of a cybernetic system,” in her opinion, because it made possible “true control and self-control of the visitor concerning the received information.”\textsuperscript{29} Without the tests and other devices employed in a normal schooling format, museum educators had no way of knowing whether or not the information they were transmitting reached their goal.

Whether in planning or practice, politics or education, cybernetics presented tantalizing, yet vexed, possibilities. There were also political contests to take into consideration – at the beginning, nobody wanted to leave the field of cybernetic thought alone to the capitalists, as a 1966 conference in Dresden proved.\textsuperscript{30} Thus, cybernetics showed the conundrum of GDR cultural demarcation policies in a modern age. Despite the best efforts of GDR officials to demote cybernetics, they could not completely quell the theory since it was tied to computers and, thus, the economic future of the nation. If the GDR sought to make incursions in the international arena, the international spheres of politics and scholarly disciplines in turn had influences upon national policies and theoretical discussions more than SED leaders would have perhaps liked.

\textit{Dresden, Fritz Leuschner, and the values of interconnectivity}

The riddle that cybernetic theories posed for cultural policy in the GDR was particularly visible in the internationally renowned city of Dresden. In World War II, allies had defended their targeting of Dresden because it was a major railway hub for

\textsuperscript{28} On the difference between an democratic, aesthetic education in the GDR and Western (German) “free education,” see B.T. Lichatsow, “Aktuelle Probleme der aesthetischen Erziehung der heranwachsenden Generation,” \textit{Schule und Museum im einheitlichen sozialistischen Bildungssystem der DDR} 10 (1975).

\textsuperscript{29} Jahn, ”Ausstellungsabschnitte zu programmieren.”

\textsuperscript{30} Weber and Engelskirchen, \textit{Streit um die Technikgeschichte}, 307.
Eastern Europe and *Mitteleuropa*, and thus a center of traffic, cultural, and industrial exchange. The advantageous location, however, also helped Dresden to recover. After reconstruction, the region’s (*Bezirk*) 1.9 million residents (circa 1973) and the city itself became representatives of the GDR to the world.\(^{31}\) Although the famed architecture and museum collections of the city had sustained much damage, Dresden was still a touristic-worthy destination. This was particularly the case for Eastern Bloc citizens, since Dresden lay conveniently near the borders of Poland and Czechoslovakia. The city’s culture and nearby mountain excursions in “Saxony’s Switzerland” were attractive to socialists needing a respite beyond their own borders, thus local planners consciously developed this aspect of the Dresden’s profile.\(^{32}\)

While rebuilding the city’s cultural character, planners rewrote local history to emphasize Dresden’s socialist tradition. In the words of the Regional Council, Dresden possessed a “technically-trained proletariat, reared in the industrial tradition, and ready for the development of other industrial branches” that needed to be emphasized.\(^{33}\) The socialist tradition did in fact run quite deep, because the mining and industrial precociousness of the Saxon region had a corresponding effect on politics. Considered the “cradle and bastion of German Social Democracy,” Saxony and its leading cities of Dresden and Leipzig had reputations for leftist opposition.\(^{34}\) Dresden’s own radical history dated from the May Uprising of Dresden, one of the last revolts associated with the German Revolution of 1848.\(^{35}\) The city was also, as council members pointed out,

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\(^{31}\) Rat des Bezirkes Dresden, "Profilierungskonzeption für die Museen des Bezirkes Dresden."

\(^{32}\) Ibid.

\(^{33}\) Ibid.


“tightly bound” to famous socialist revolutionaries like Wilhelm Liebknecht and August Bebel, founders of the Social Democratic Workers' Party of Germany 
(Sozialdemokratische Arbeiterpartei Deutschlands).\textsuperscript{36}

Yet the socialist past that functionaries tried to depict was not always consistent in Dresden and, in fact, riddled with contradictions. Despite the revolutionary legacy, a particularly authoritarian regime ruled the region until 1918. Thus, the might and opulence, or Macht und Pracht, of Dresden’s architecture had a real political corollary.\textsuperscript{37} Support for the National Socialist party enjoyed early popularity in the area as well. Not only was the first regional group (Ortsgruppe) of the Nazi Party founded in nearby Zwickau, but the National Socialists also achieved their first national electoral victory in Saxony.\textsuperscript{38} Although Dresden itself supported the NSDAP less than the national average prior to Hitler’s assumption of the chancellery, the difference in percentage points was quite small. Thus, “Red Saxony,” had ceased to exist by 1933.\textsuperscript{39} By the end of the century, Dresden would again be marked by conformity rather than revolution, at least in areas of education: while the region would prove to be the most thorough in purging the ranks after 1989/90, there was, at the same time, a substantial staff to purge.\textsuperscript{40}

As city organizers attempted to recapture the city’s cultural significance, however, they strove to make museums, the centerpieces of Dresden’s former landscape, into ideologically consistent educational institutions. Indeed, leading museologist Patzwall had commended Dresden’s local or Heimatmuseum for showing signs of educational

\textsuperscript{36} Rat des Bezirkes Dresden, "Profilierungskonzeption für die Museen des Bezirkes Dresden."
\textsuperscript{37} Retallack, "Saxon Signposts."
\textsuperscript{38} Benjamin Lapp, "Der Aufstieg des Nationalsozialismus in Sachsen," in Pommerin, Dresden unterm Hakenkreuz; Gunda Ulbricht, "Die Wahlen in Dresden 1932/33," in Pommerin, Dresden unterm Hakenkreuz.
\textsuperscript{39} Lapp, "Der Aufstieg des Nationalsozialismus in Sachsen"; Ulbricht, "Die Wahlen in Dresden 1932/33."
\textsuperscript{40} Rodden, Repainting the Little Red Schoolhouse.
precociousness well before 1945. In spite of fallible “nationalistic and antiproletarian” aspects, the Heimatmuseum of Dresden contributed significantly to general public education and possessed an ultimately “progressive” sensitivity to school objectives.\(^4\)

Now, Patzwall argued, these institutions could be organized according to socialist principles for socialist purposes. “Careful planning” in collaboration with the centralized, regional organ would result in representations that showed the appropriate, or Marxist, connection among the resources and economics of local geography.\(^2\) In 1973, planners precisely articulated the parameters of an ideological commitment to Marxist-Leninism and socialist politics for all Dresden museums, defining five focal points of museum activity for the city’s ninety-six venues. Museums were to

1. contribute to the construction of a larger socialist community in the GDR by representing the development of its local incarnation,
2. represent the integration of international socialism and a “tradition” of friendship with the Soviet Union,
3. represent the history of the worker’s movement in connection with the emergence – and dissolution – of capitalism,
4. represent local history as contributing to the working-out and consolidation of a socialist historical consciousness,
5. and represent the region of Dresden as a modern socialist center of science and technology, specifically heavy industry, metallurgy, data processing, electronics and electrical engineering.\(^3\)

In these points, planners described the ways that cultural institutions in Dresden would join local issues to national interests, national to international events, workers to the world, and the past, present, and future for socialism. Dresden’s museums were to understand their contributions as part of a web of intersecting currents and interests that reflected the dynamics of their locale.

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\(^2\) Ibid.: 11-12.

\(^3\) Rat des Bezirkes Dresden, "Profilierungskonzeption für die Museen des Bezirkes Dresden," 9-10.
The final point about science and technology may have been especially significant to technical museums, but the region did have a distinctly technological character. Indeed, in what was *the* engineering center of eastern Germany, Dresden had long been associated with developments in electronics and technologies dealing with electricity, including entertainment technologies and medical technology. After the war, these industries continued, and the city even was home to the nation’s short-lived nuclear research programs. The efforts to rebuild the city’s economic profile not only demanded a financial commitment to local industries, but also required educational resources in order to create a technologically adept working population. Developing a sense of cultural identity as a technological center factored into the endeavor. The Technische Hochschule Dresden (Technical College of Dresden, TH Dresden) was quickly re-founded, and began teaching of the history of technology as early as 1946.

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44 In the suburb of Rossendorf, the Central Institute for Nuclear Research (Zentralinstitut für Kernforschung) started a research reactor in December 1957. When costs prohibited further development, the institute closed in 1962, Burghard Weiss, "Nuclear Research and Technology in Comparative Perspective," in Mackrakis and Hoffmann, *Science under Socialism.*
East German efforts thereby established new chairs in technological history faster than West Germany. In 1953, the faculty even founded an Institute for the History of Technology and the Natural Sciences (Institut für Geschichte der Technik und Naturwissenschaften) at the college that, despite its eventual dissolution, influenced history of technology research in the years afterward. In one of the “most significant regions of industry in the Republic,” according to a perspective partial to technical exhibitions, the technological cultural landscape also included museums. Renowned collections of two museums that survived the war – the Transportation (Verkehrsmuseum) and the Hygienemuseum – reflected the city’s former dominance in technologies of transport and medicine. The National Army Museum (Armeemuseum der DDR), which also included a host of military technology, relocated to Dresden from Potsdam in 1972.

Yet some wanted more for the region’s technological landscape, and had ambitions for a national museum dedicated to technology. As early as 1951, educators at the Institute for the History of Technology and Science, which “provocatively contain(ed) ‘technology’ before ‘science’ in the title,” requested the creation of such a museum. Professor Kurt Koloc, rector for the History of Technology at TH Dresden, also published an article in the local newspaper on the topic to stress the region’s need for the

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45 Weber and Engelskirchen Streit um die Technikgeschichte; Weber, "History of Technology after 1945."
46 Weber and Engelskirchen, Streit um die Technikgeschichte; Weber, "History of Technology after 1945."
48 Originally opened in 1961 in Potsdam, the institution moved to Dresden since the city had more space to offer; Manfred Lachmann and Johannes Streubel, "Das Armeemuseum der Deutschen Demokratischen Republik: Stätte militärpolitischer Erziehung und Bildung - Schatzkammer militärhistorischer Sachzeugen," Revue internationale d'histoire militaire 43 (1979).
49 Weber, "History of Technology after 1945."
museum. In 1955, the yearly congress of the GDR’s Academy of Technology (Kammer der Technik) echoed Koloc’s demand. The efforts floundered, however, as the Institute fell out of favor for not being ideological enough according to orthodox lights. Things finally turned as ideologues became increasing aware of technological education venues emerging across the border – in 1966, the University of Bochum in the Ruhr Valley opened as the first full-fledged university with a department for the history of technology – and Ulbricht’s policies for polytechnical education picked up steam.

On 15 June 1966, the Regional Council of Dresden (Rat des Bezirkes) founded what eventually came to be called the Technisches Museum Dresden. Opening five months later on the first of November as the Polytechnical Museum Dresden, local administrators hoped that its significance would extend beyond the city and region. Their ultimate goal was an institution that could rival the Deutsches Museum, but with a focus on “socialist technology” instead.

In the end, the museum proved to be the antithesis of the ambitious aims. Though among the first – and few – technology museums built in the GDR, Dresden played a very pronounced second fiddle to almost every technological venue in the country. Never able to expand past the 320 square meters (a little over 3,200 square feet) that city functionaries allocated in 1966, the TMD was truly a bite-sized museum.

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51 Leuschner, "Technische Revolution und Bildung."

52 Weber, "History of Technology after 1945."

53 Ibid.

54 Weber and Engelskirchen, Streit um die Technikgeschichte, 190.

Moreover, the TMD did not straddle expert and novice worlds as the Deutsches Museum did, becoming instead "a museum for the people." That is, the Dresden museum was "no museum for specialists" and aimed at the tenth-grade viewer.\textsuperscript{56} Also, although the regional council tried to cast the museum as having supraregional (überregional) importance, and while the TMD certainly tried to perform like an international institution by collaborating beyond GDR borders, it never attained Group I classification.\textsuperscript{57} Faced with a constant lack of resources, the museum narrowed its scope during the years 1967 to 1971. In keeping with the technological strengths of the region, the museum became instead "the only institution of our republic for museological research, collecting, and exhibition activities in the areas of electronics, photography, writing, and calculating technologies."\textsuperscript{58} The tighter focus also corresponded with a administrative transfer for the museum from regional to city council. The new name of Technisches Museum Dresden on 1 May 1975 reflected all these changes.\textsuperscript{59}

However, museum workers did not abandon their own goals for broad impact, and the man most responsible for the TMD explained why. Fritz Leuschner's background and education well equipped him for a job that touted the cultural meaning of technology for socialism. Born 4 May 1920 in Schweidnitz as the son of a metalworker and hair-


\textsuperscript{57} On the significance of Group I status for museums in the GDR, see Chapter 2. In a draft on the current affairs and long-term conceptualization of the TMD, an unknown writer suggests that the museum did acquire Group I status in "Bericht und Langfristige Konzeption[sic] zur Entwicklung des Polytechnischen Museums Dresden," 7 April 1975, TMD Engelsstr 5a, Techn. Museum. However, none of the documents at the Ministry for Culture bear this out; it seems that it was a hopeful projection of what the TMD might achieve, perhaps to support yet another request for greater exhibition space. Rat der Stadt Dresden, "Beschlussgegenstand 'Bericht und Konzeption für die weitere Entwicklung des Polytechnischen Museums in Dresden,'" 10 April 1975, TMD Ordner "Engelsstr 5a, Techn. Museum."


\textsuperscript{59} Andrea Kroh et al., ed., \textit{Technisches Museum Dresden: Die Sammlungen} (Dresden: Technisches Museum Dresden, 1992); Fritz Leuschner, "Technisches Museum Dresden," 1986, TMD Ordner A; Leuschner, "Technisches Museum Dresden." Another explanation of the name change noted that a 'Polytechnisches Museum' seemed to suggest that it was only for students, and not the general public. Leuschner, "Technisches Museum Dresden," 8.
stylist, Leuschner served in the Information Corps during World War II. Returning from a Soviet prisoner of war camp, he worked at the concern VEB Görlitzer-Machinenbau as a mechanic, then began studies in 1949 at the TH Dresden. Until 1953, Leuschner studied Pedagogy and Cultural Sciences, specialized in Mechanical Engineering, and graduated with a technical instruction degree (Diplom-Gewerbelehrer). Before assuming directorship of the TMD, Leuschner worked at the Institute for the History of Technology and Natural Sciences as an assistant specializing in technical museums and monuments.\(^{60}\)

From the outset, Leuschner theorized the practical and ideological benefits of smaller scaled, polytechnical museums, and expounded them in his dissertation for Humboldt University. In “The Technical Revolution and Education: On the Necessity of Polytechnical Museums in the GDR,” which he finished a year after the TMD’s opening, Leuschner argued that small museums had the advantage of accessibility to an unsophisticated public. The enthusiasm that V. I. Lenin and his spouse, Nadezhda Krupskaja, had for the petite polytechnical museum served as the canonical basis for his work.\(^{61}\) Moreover, smallness was ideologically antithetical to the large and encyclopedic Deutsches Museum in Munich. According to Leuschner, the Deutsches Museum epitomized how “imperialism discovered the ideological value of technology, with its display of exciting achievements.” The museum had acquired in founder Oskar von

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\(^{60}\) Leuschner, "Technische Revolution und Bildung."

\(^{61}\) He noted that Lenin and Lenin’s spouse Nadezhda Krupskaja were of the same mind, as they had both called for small technical museums: Lenin had wanted the creation of small museums, steam engines and trains, among other objects in order to support polytechnical education. Krupskaja, according to Leuschner, had demanded the “organizational of a net of small polytechnical museums as well as departments devoted especially to polytechnics in existing local history museums (Heimatkundemuseen),” N. J. Krupskaja, Über die allgemeinbildende polytechnische Schule (Berlin: 1955), 145-46. As quoted in Leuschner, "Technische Revolution und Bildung", 14. As Leuschner understood Lenin, “the building of small polytechnical museums emerged under the concrete situation of the young Soviet power, which was interested in giving all Soviet persons the opportunity to further their education,” Leuschner, "Technische Revolution und Bildung," 15.
Miller's estimation over ten million marks in assets by the 1930s, many of which Leuschner pointed out were gifts from the industrial sector. Thus, "tax-free donations, the cheap public relations benefit, [and] the ideological influence upon the visitor to favor the industrial class" characterized the Deutsches Museum. Technical achievements also acquired a "nationalistic" and anti-social dimension in the museum as entrepreneurs and potentates alike became "representatives or supporters of technological progress and as benefactors of mankind." As the prototype for museums of technology, the Deutsches Museum was nonetheless an example from which to learn; quizzes that Leuschner authored for museum staff ensured a familiarity with von Miller, for example. However, the Deutsches Museum was also a symbol of what to avoid.⁶²

Therefore, the very limitations of Dresden's Technical Museum affirmed socialism, including a dependence upon, or "interdependence" with, other organizations. Inspired by his mentor Alfons Kauffeldt, who succeeded Koloc at TH Dresden, Leuschner proposed a "new" and "economic" way — no doubt referring to the New Economic System — of creating a museum. Since resources were not freely available from the city or state, a museum like the TMD could tap into those of the community and foster a network of exchange that included the local university, specialized schools, industries, and the range of scientific museums administered by the State Secretary of Specialized Schools and Universities (Staatssekretariat für das Fach- und Hochschulwesen). Furthermore, Kauffeldt's 1962 essay even entertained the idea of possible profit for the museum through the production of books and films.⁶³ Certainly, Leuschner's proposal differed radically from the recent fantasies of autarky under

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⁶³ Leuschner, "Technische Revolution und Bildung."
Nazism. While differences with the practices of Deutsches Museum might be difficult for an outside viewer to determine, Leuschner argued that his were consciously socialist. In relying upon and joining with other institutions of education and culture, the museum helped to fulfill the larger “social task,” which was the “development of a socialist, national culture and deepening of a “Marxist-Leninist worldview.”64 A principle of interconnectivity thus set the TMD apart from the Deutsches Museum, and indeed marked the socialist museum of technology.

In fact, the very essence of a “polytechnic” philosophy lay in the recognition of the social, and socialist, interconnections that grounded all life.65 An exhibition’s “polytechnical aspect,” as Leuschner elaborated in his prospectus for the museum between 1977 and 1990, should “make easily recognizable the natural scientific laws, main elements, effective principles, and essential features of technology” and their application.66 Yet the museum could only accomplish this task if it revealed the “interrelationships (Zusammenhänge) of politics, the economy, the natural sciences, and technology on the one hand, and mankind, nature, and technology on the other.” If successful, the result was a “scientific,” or socialist “worldview” on the part of the viewer.67 A polytechnic perspective, when understood appropriately, also demanded a conscious relationship with the community that respected these interconnections. This, in Leuschner’s view, made the TMD superior to museums that merely contained technological exhibits.68 Therefore, the dropping of “polytechnic” from the museum’s

64 Leuschner, "Konzeption des Technischen Museums Dresden für die Jahre 1977-1990."
65 The “Polytechnical Principle” was a catchphrase of socialism.
66 Ibid., 3.
67 Ibid.
68 As noted in Chapter 2, the local Verkehrsmuseum was not “polytechnical” in this manner. The lack of a political or ideological connection was what specifically made this Group I technology museum (with an attendance of 470,000 in 1963) contemptuous, an opinion shared by Polytechnical Museum of Schwerin
name in 1975 was not critical, since the TMD continued to affirm the same principles that made it “polytechnically oriented in an evidential way.”

A major goal of emphasizing interconnectivity was productivity. Using organic, and even cybernetic, terms to describe the main mission of technology museums in a socialist society, Leuschner articulated the practical results of a polytechnical worldview. In his view, technology museums not only deepened awareness of the “dialectical relationship” between society and science, but also contributed a better understanding of the Human-Nature-Technology relationship as well as the connection between technology, economics, and politics. [Technology museums] help to obtain an overview of the entire organism of production and economy and thus further the insight of socialist producers as to their own role and responsibility [within it].

Melding organic to machine worlds, Leuschner not only invoked a cybernetic understanding of the world, but also maintained that a careful look at the history of technology and society would uncover deep biological structures that ensured socialist success. Viewers that adopted the goal of productive labor were then simply recognizing the true state of world affairs and aligning themselves with socialist processes.

A better knowledge of “Nature” would properly direct workers’ actions, but its dynamic interconnections were not obvious. The precise details of relationships between man and machine, individual and society, or life and productivity were not self-evident. As it happened, Leuschner was able to work out the details of representing socialist interconnection before the TMD even opened its doors.


Technika Didaktika

A cooperative exhibition among four museums titled Technika Didaktika contained key principles of pedagogical practice that would guide the Technical Museum of Dresden throughout its life. To create the exhibits, the TMD joined the Moscow Polytechnic Museum (Politekhnicheskii Muzei), the National Technical Museum in Prague (Národní Technické Muzeum), and the Technical Museum in Warsaw. Since the venture began while Dresden’s museum was still in the planning stages, Technika Didaktika was an important step in codifying the ways that the TMD would approach polytechnical education. Specifically, the exhibition’s attempts to harness the latest methods of popularizing technological education, to collaborate internationally, and to depict socialism and technology in everyday life would eventually define the TMD.

A forerunner to the exhibition, which was already the result of ten years of cooperative effort among the other museums, took place at the Technical Museum in Warsaw on 15 May 1967. Plans for Technika Didaktika, and East Germany’s participation in particular, were underway from at least the year before. Since the event promised to illustrate the ways that museums could contribute to general polytechnical education, Leuschner and his staff kept both the Ministry for Culture and the Ministry for People’s Education abreast of the planning. Apparently, ministry demands were

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71 Staff member Irene Ludewig’s memo suggests that the exhibitions of the Technical Museum of Warsaw were in fact titled "Museen der Technik als Instrument polytechnischer Bildung" (Museums of Technology as Instruments of Polytechnical Education) and "Die Schule der Zukunft" (The School of the Future). Whether or not it was an “official” Technika Didaktika exhibit, the conference-symposium held in conjunction with the Warsaw exhibit was the active starting point of the Technika collaboration, Irene Ludewig, to Bauer, 29 May 1967, BA-SAPMO DR 2/A4562; Technisches Museum Dresden, "Brigadebuch: 5 Jahre Polytechnisches Museum Dresden 1971," 1971[?], TMD Brigadebuch 1.
72 Klaus Gysi (Ministry of Culture) asks Margot Honecker (Ministry of People’s Education) for a representative well before the TMD’s founding. See Klaus Gysi, Letter to Margot Honecker, 28 January 1966, BA-SAPMO DR 2/A4562.
73 Ibid.; Ludewig.
relatively simple; so long as the museums emphasized the role of technology for achieving a socialist society and did not demand too much from centralized sources, all was well. At least, in response to Leuschner’s questions, a representative from the Ministry for People’s Education replied circuitously that polytechnical education in the museum was a straightforward matter and that, moreover, that the expansion of technical museums was not on the agenda in spite of the renewed emphasis on technology proclaimed by the recent seventh Party Congress.\(^{74}\)

According to a planning conference for *Technika Didaktika*, a central goal of the exhibition was to take advantage of new educational methods for technology and socialism. Technological advances, like nuclear energy and space travel, marked the advanced nature of the times and this “new era” demanded a new, and specifically socialist, education.\(^{75}\) At the same time, the exhibition addressed what planners considered to be the underexploited state of achievements in “socialist modern society.”\(^{76}\) Socialist, in this instance, meant the Eastern bloc nations in the Council for Mutual Economic Assistance (COMECON, or RGW in German), which the USSR formed in response to the United States Marshall plan for economic aid to West Germany. Thus, *Technika Didaktika* could help solidify the coordination and commitment among COMECON nations, and promote socialist goods as well.\(^{77}\)

Exhibition planners used everyday, approachable themes to popularize technology. For example, the Polish contribution to the exhibition focused on types of

\(^{74}\) The seventh congress announced the Economic System of Socialism (ESS), which reasserted the goal of advanced technology even as it muted the freedoms of the prior plan of NES. More detail is in Chapter 2. Prof. Dr. Kaiser, Letter to Fritz Leuschner, 21 June 1967, BA-SAPMO DR 2/A4562.

\(^{75}\) Ludewig.

\(^{76}\) Ibid.

\(^{77}\) Ibid.
energy, a major subject for socialist economic development. In order to do this, the installation first included a meditation on the sun as both a “source of energy and life.” Organizers presented the sun in a larger “history of humanity,” such as its symbolic and religious importance. The introduction also included Copernicus, whose theory overturned the earth-centered Ptolemaic understanding of the universe and illustrated the kind of mental revolution in viewers that the museums hoped to accomplish for socialism. After reminding viewers that an energy source like the sun had resplendent meaning for humanity, and in fact made life possible, the installation then drew out technology’s significance for socialist living in the more complex energy developments of electricity or petroleum.

The overall didactic aim was for viewers to understand both socialism and technology as integral to the nature of humanity, which the TMD captured in its installation on photography and film. The exhibit on “The Image” started with the assertion that the science of image reproduction was a basic need of mankind. Placard One introduced visitors to the view that the “need to reproduce images of the world ...[was] old as conscious man himself.” Technology was intricately tied to this need, because it shaped the quality and nature of reproductions. Beginning with prehistoric man and cave paintings, the installation then traced a long history of humans and images. As the story went through the Greeks to the printing press, the designers incorporated

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80 Technisches Museum Dresden, "Technika Didaktika, Polytechnische Museen im Dienst der polytechnischen Bildung."
81 In two copies of the exhibition layout: Fritz Leuschner, "Drehbuch für den Ausstellungsteil der DDR der 'Technika - Didaktika' in Prag 1968," 5 March 1968, BA-SAPMO DR 1/7460; Technisches Museum Dresden, "Drehbuch für den Ausstellungsteil der DDR der 'Technika-Didaktika,'" 1968[?].
another human need – communication – into their account of technological developments as well. The progressive history finally culminated in the most recent, and highest, development: the camera.\textsuperscript{82}

After the long view of human history, the TMD introduced Dresden’s camera industry. Indeed, camera production in Dresden had a noteworthy past from the late-nineteenth century. With the availability of first-class lens technologies from Jena, influential innovations of the Single-Lens Reflex Camera (SLR) for 35-millimeter film took place in Dresden.\textsuperscript{83} By 1926, Dresden also became home to the Zeiss-Ikon Company, the biggest camera manufacturer in Europe of the period.\textsuperscript{84} The East German successor to the pioneering industry was VEB Pentacon, which continued to cooperate with the rebuilt Carl Zeiss Jena lens company. In light of all the machinery that had been dismantled and carted off by Americans and Russians alike, the survival, let alone excellence, of both industries was astounding.\textsuperscript{85} Aspiring worldwide recognition for their products, VEB Pentacon continued the local camera tradition and made innovations in camera technology during the 1960s.\textsuperscript{86}

\textsuperscript{82} Leuschner, "Drehbuch für den Ausstellungsteil der DDR der 'Technika - Didaktika' in Prag 1968"; Technisches Museum Dresden, "Drehbuch für den Ausstellungsteil der DDR der 'Technika-Didaktika'.”
\textsuperscript{85} Naimark makes this observation with regards to Zeiss Jena in Norman Naimark, The Russians in Germany: A History of the Soviet Zone of Occupation, 1945-1949 (Cambridge, MA and London: Belknap [Harvard University Press], 1995). However, Zeiss Jena’s excellence becomes understandable when considering that administrators reorganized the entire resources of the local university to support the company, Uwe Hoßfeld, Jürgen John, and Rüdiger Stutz, "Weaving Networks: The University of Jena in the Weimar Republic, the Third Reich, and the postwar East German state," in Walker, Science and Ideology.
\textsuperscript{86} For example, in 1965 the PRAKTICA mat by VEB Pentacon Dresden was the first SLR camera with TTL exposure measurement to be manufactured in Europe and in 1969, it created the PRAKTICA LLC which the company hailed as a "world novelty": the first SLR camera with an electrical diaphragm situated between the camera body and the system’s interchangeable lenses, see Pentacon GmbH. Praktica.
Recent successes of VEB Pentacon made it easy for the museum to portray the camera as an example of socialist triumph. Between capitalist beginnings and a superior socialist product, the exhibit represented Pentacon’s achievement as a “natural” development of the camera industry. Viewers also learned that the camera production itself had two socialist dimensions. First, because cameras fulfilled the basic human need of image production, they were necessarily socialist. Second, the manufacturing process of cameras could be ideological as well. By implementing “the socialist rules of production” in the work environment, VEB Pentacon had created specifically socialist labor conditions that led to high quality products. As Placard 26 of the exhibition proclaimed, “only under the relations of socialist production did employees of Dresden's camera industry encounter work conditions that – through the development of socialist corporate work efforts in the VEB concern Pentacon – combined the scientifically and technically grounded production with the experiences of thousands of specialists.”  

Because Pentacon’s excellence relied upon technically skilled laborers, the TMD’s story of the camera was also a paean to socialist education. “Nowadays,” the exhibit intoned, “the apprenticing of young, qualified specialists begins from school, corresponding to the Unified Socialist Educational System of the GDR; they are put straight into production, and are informed about career education and the many possibilities of advanced qualification.” In a picture of Pentacon’s 1,500 students, the TMD showed bright youths who were “gaining a glimpse into production [and] basic skills into handling of materials and finishing of excellent projection devices, image

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87 Leuschner, "Drehbuch für den Ausstellungsteil der DDR der 'Technika - Didaktika' in Prag 1968."; Technisches Museum Dresden, "Drehbuch für den Ausstellungsteil der DDR der 'Technika-Didaktika.'"
viewer, and slide devices.” Through cameras, the TMD not only showcased the brilliant results of technological instruction in the GDR. The productive implications for the museum’s own educational efforts were also clear.

In the end, pictures revealed not merely the meaning of humanity, but also socialist ideals, economics, and education; even the operation of taking pictures became a socialist act. At the installation’s conclusion, the TMD explicitly reinforced the connections between the camera, humanity, and socialism. Returning to the issue of vital need, the installation tied “basic” human desires, like picture taking, with humane values and socialism. Though the pictures that exhibition designers used to illustrate each principle are lost, it is not difficult to imagine the photos they used:

The human desires to recognize himself in pictures.

In pictures, the human desires to preserve images of home (*Heimat*).

The human wants to see himself in his life and work.

The human wants to commemorate world events in pictures.

In pictures and through pictures, man wants to claim the party for a socialist humanism, for peace, and for the understanding of peoples.  

Capturing the moments of everyday life and aspiration, images were an everyday tool for socialism to be used by everyday men.

Yet the realities of capturing the party for a socialist humanism were not as picturesque as the exhibition averred. *Technika Didaktika*’s first unveiling took place in Prague during the month of March 1968 and what was perhaps the ultimate attempt for humane socialism. The Soviet army brutally suppressed the moment of liberalization represented by the “Prague Spring,” and the didactic exhibit continued onwards to

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88 Leuschner, "Drehbuch für den Ausstellungsteil der DDR der 'Technika - Didaktika' in Prag 1968."
89 Technisches Museum Dresden, "Drehbuch für den Ausstellungsteil der DDR der 'Technika-Didaktika,'" 8.
Dresden in 1969, ending in Moscow in 1970. The events of 1968 were a marked contrast to the museum’s depiction of harmony between “human,” or universal, character traits and socialist values that the TMD hoped would legitimize the socialist project. Moreover, the exhibit’s appeal to universal values sanctioned international interactions, whether on the institutional or political level, as a way to overcome limitations in the museum’s – and nation’s – resources. However, the irony of a humane exhibit wanting “to commemorate world events” resulted precisely from the international or universal dimension within which the museum wished to operate.

Dresden continued collaborations not only with Prague or the USSR, but even non-Eastern bloc countries such as France, which ensured that the tension, or contradiction, remained. In fact, the pursuit of international museum cooperation was enmeshed in Cold War politics. Founded after the war, the International Council of Museums (ICOM) was an organization with affiliations to UNESCO that restricted membership to officially recognized national committees. When ICOM founder and President Chauncey J. Hamlin invited Germany to form a committee in 1951, the result was a solely West German organization. Though East Germany clamored for recognition from the 1950s, it only first participated in ICOM’s 1965 annual conference and became a full-fledged member in 1967. Leuschner’s notes suggest that the delay was due to pressure on the part of West Germany, whose politicians did not want the GDR to win any kind of recognition, and therefore legitimacy, from a UNESCO-related institution. Eventually becoming a member of ICOM’s oldest committee (which was on issues of science and technology), Leuschner’s participation fulfilled the continued demands by East German museologists and the Ministry for Culture to work with ICOM and other

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international groups. However, while the TMD won global recognition in the realms of culture, as GDR had in politics, increased international participation also complicated the types of claims that the museum could make, since its audience now included capitalists.

Figure 14 - Electrostatics from the Palais de la Découverte, Paris


Another complication was that the museum’s legitimacy also rested on the experiential corroboration of visitors. Through appeals to an ostensibly shared range of emotion and everyday experience, the TMD’s exhibition on images strove to capture the audience’s affections. Yet depending on the audience judgment was a tricky matter. If the staff was correct in their assumptions, personal reflection would result in the viewer adopting an integrated socialist worldview that included technology, economics, and education. What if, however, people searched their everyday experience, the range of their human emotions, and their interconnections with the Western world to a different result? Because its educational paradigm was intrinsically double-edged, the TMD

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would employ a policy of guidance – or steering, to use the cybernetic term – within its walls to tread the tensions between evaluations on the universal and individual levels.

*Guiding love, “peace,” and technology in everyday Dresden*

The TMD’s first ten years (1966-1976) saw the formation of permanent exhibitions that stayed in place for most of the museum’s existence. By 1976, if not already in 1971, the museum included installations on typewriting, X-ray technology (reflecting the medical industries of the area), and various electronic devices.72 A steady stream of traveling exhibitions, often from Moscow, Prague, and even Paris, enlivened the small space. To keep track of the changes, staff members of the TMD maintained scrapbooks that reflected its cozy nature. Throughout Leuschner’s tenure, which ended in 1986, personnel diligently followed this practice originating from the Bitterfeld Movement, which was an ongoing, nationwide attempt to bridge divides between art and “[real] life.”73 Scrapbooks were a means of “proving political engagement,” and proved to be a method of political self-censoring as well.74 Personnel recorded silver anniversaries, annual women’s appreciation days and the like, but also their active political involvement through “solidarity donations” for comrades in war-ravaged Vietnam and Chile.75

However modest in size and scale, the museum was not modest in their hopes. In an exhibition draft on electronics for the average viewer, the TMD staff claimed to make socialism itself possible:

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72 Technisches Museum Dresden, "Brigadebuch 6," 6. 1971 was the occasion of a major restructuring.
73 In the first Bitterfeld Movement of April 1959, writers went into factories in order to learn the ins and outs of industrial production as a means of overcoming “alienation,” David Bathrick, *The Powers of Speech: The Politics of Culture in the GDR* (Lincoln, NB & London: University of Nebraska Press, 1995).
74 Staritz, *Geschichte der DDR*, 181.
75 Solidarity donations were a coordinated practice, as the files of SAPMO attest.
we know what creative powers yet slumber in our people. We want to support the effort to awaken and develop them. Winning the cooperative efforts of millions of workers towards scientific-technological progress is something that is possible in our type of society, a path that capitalism cannot follow. It is an extraordinarily worthy and rewarding goal; we could win many millions in marks and in hearts at the same time.  

With goals of affection and economics, the TMD tried to steer visitors’ reading of technology in a way that followed the cybernetic models of pedagogues like Patzwall and Jahn. Specifically, the museum used the area of everyday technologies to inculcate a sense of loyalty to the state by creating positive emotional associations between socialism and everyday life. With emotional trust gained, the anticipated effect was improved economic and social circumstances.

The key to the museum’s methodology was personal guidance, which was taken very seriously. As Leuschner wrote in his reflections on the ten year anniversary of the museum, “all [visitors] are personally looked after by the staff collective (Mitarbeiterkollektiv), whereby we mean ‘looked after’ literally: the fundamental principle of our collective has been and is that no visitor should be left to their own devices in our exhibition.” Because Leuschner and the TMD crew were interested in the most direct contact possible with the viewer, visitor guestbooks, for example, were an especially crucial part of the installations. Staff would then know immediately whether or not something was wrong with the exhibitions. The desire for direct influence in the interpretation of exhibitions extended even to the Jugendstunden (Youth Dedication Classes), which normally allowed schoolteachers to lead their own classes. Discussions over this possibility caused some consternation for at least one of the personnel; not only

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56 The original author of the draft was Alfons Kauffeldt, who seems to have been working in collaboration with the museum, Technisches Museum Dresden, "Museum Führungstexte, Drehbücher," TMD Führungstexte, 20.
did the issue of space make the teaching of independent classes impractical, but he
worried that they would conflict with the programs that staff had already developed.98

One revealing example of museum steering was the script for the X-ray exhibit.
An image of badly damaged lungs alongside the X-ray showed not merely overall
advances in technology, but also the technological power of the young state. The display
focused on the efforts of the national "People's X-Ray Campaign," which addressed all
lung illnesses. Museum guides recounted the success of the drive; since an X-ray was a
mere 84 cents, the campaign prevented great cost even when combined with other
preventative measures, the total of which were cheaper than having to heal severe cases.
Scripted down to pauses, the presentation's libretto explained why the installation
communicated the GDR's capable care of its citizens. The X-ray lesson of prevention
and foresight was an important one for citizens to learn in a system where all health care
was under the purview of the state, and the state claimed to direct and control the
future.99 In turn, the museum hoped to produce a loyal response on the part of the visitor.

Workers at the TMD also aimed to create the most appealing exhibition possible,
and showed themselves to be adeptly acquainted with the cybernetic learning
mechanisms that Schule und Museum writers like Patzwall and Jahn espoused.100
According to Leuschner, the staff "naturally placed importance on colorfully appropriate
presentations, so that the viewer might feel at home with us and be aesthetically
influenced in a positive way."101 Yet the subject matter of the TMD's exhibitions was

98 "P" (to protect identity), "Dienstreisebericht Schwerin über die Schulung pädagogischer Mitarbeiter, 12.-
99 Technisches Museum Dresden, "Museum Führungstexte, Drehbücher."
100 Almost the entire set of Schule und Museum, and other museological works, were available to TMD
museum staff. Their library was assumed into today's Technische Sammlungen der Stadt Dresden.
101 Leuschner, "Das Technische Museum Dresden (10 Jahre)," 10.
attractive as well. In general, much of the museum’s focus dealt with the popular
entertainment technologies, whether in permanent or special exhibitions. Thus music, for
example, was an appropriate topic, which had great promise for creating national loyalty.
According to one member of the staff, the emotional influence of music was an easy way
for visitors to develop a love for their country. He thought that music for museum
programs should be chosen that not only “appeals emotionally to children,” but develops
their “sense for beauty.” Furthermore, with a selection of local performers and
orchestras, museum work could “deepen a love for the socialist home”; one staff member
suggested the possibility of even tailoring exhibitions to include the hometown cultural
works of children when they came from afar.

Figure 15 “A Ramble Through the Technical Museum”

Rather than cold, impersonal machinery, this showcase of the TMD for Dresden
Museums displays the stylish nostalgic fashions, in dress and technology, that visitors could

102 "P,” “Über die Arbeit mit Kindergarten- und Hortgruppen im Technischen Museum Dresden,” TMD
Geschichte, 2.
However, the museum’s attempt to win hearts and marks for the state was not always an emotionally uplifting one. In fostering nationalism, the museum stoked antagonism against the West. Strangely, like many other propaganda campaigns in East Germany, exhibition organizers cloaked the language of antagonism in words of peace. For instance, the museum’s very first special exhibition from the Soviet Union in 1970 on space exploration trumpeted: “peaceful space exploration is the desire of all mankind.”

Throughout their exhibitions, the TMD followed the common argument that socialists were the only authentic defenders of peace and yet, staff designed exhibitions to create a deeper sense of opposition to the GDR’s Cold War enemies. This was particularly the case in museum narrations of revolution and evolution that contrasted the benefits of party socialism to the negative consequences of capitalism. In these stories, the TMD used a subtle argument, in which technology was the mechanism propelling a larger

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human development toward socialism, thereby relegating capitalism to a historically inferior role.

Beginning with "the concentration of power and monopolization in the electrical industry" at the end of the nineteenth century, the TMD spotlighted corporations like the electricity giant AEG (Allgemeine Elektrizitäts-Gesellschaft), founded by Emil Rathenau in 1883 with patents from Thomas Edison and Siemens.\textsuperscript{104} Undoubtedly, these companies made leaps in technological development, but what drove the rapid growth was, of course, money: these "leading monopolies ... accelerated the technical development of sending and receiving equipment, whereby they tried from these perfected developments to draw ever increasing profits."\textsuperscript{105} The impoverished social ethics that followed then led to the international tragedy of fascism. Rather than blaming technology, a transnational cooperative achievement, the TMD pointed instead at the bourgeois-class (\textit{bürgerlich}) state apparatus that "abetted the emergence of a mass medium that could become abused in capitalist countries, by the dominance of finance capital, for the misleading and suppression of the masses."\textsuperscript{106}

Exhibition designers had a wealth of radio propaganda examples from German history that supported their claims of destructive capitalism and the progressive unfolding of socialist technology. Highlights included the founding of the "fascist organization \textit{Reich Alliance of German Radio Subscribers}" and the Nazi prohibition of Moscow radio reception in 1934, a ban that was expanded to include all foreign countries in 1939.\textsuperscript{107}

The exhibit did not mention the ironic situation of the party discouraging GDR citizens

\textsuperscript{104} Technisches Museum Dresden, "Drehbuch: Sonderausstellung 'Unterhaltungstechnik Gestern-Heute,'" TMD Führungstexte. Technisches Museum Dresden, "Brigadebuch 3."
\textsuperscript{105} Technisches Museum Dresden, "Drehbuch: Sonderausstellung 'Unterhaltungstechnik Gestern-Heute'."
\textsuperscript{106} Ibid.
\textsuperscript{107} Ibid.
from listening West German radio, but contrasted fascist and capitalist examples to a  
"working-class" development of radio. Placards pointed out that "Freedom Station" 29.8  
helped the Central Committee of the German Communist Party (KPD) during World War  
II "to improve the political-ideological efforts of the anti-fascist resistance." Radio was a  
part of the defeat of Hitler as well. The first broadcast on 14 May 1945 – "This is Berlin!  
This is Berlin!" – signified, in the TMD's view, the presence of the first "democratic  
radio that in Germany's history that was truly in the people's interest." Thus radio  
showed "the spirit of peace, democracy, and socialism that has expanded with each  
historical event and has guided and supported each of our steps toward a better future." 

Another way to promote the peaceful intentions of the GDR while fueling  
hostility for the West was to assume role of victim. The TMD's 1981 exhibition So  
sahen Sie Dresden ("Dresden through your eyes") in the Photography Salon displayed  
pictures of the city before and after "the senseless Anglo-American ...attack [that]  
destroyed the beauty of Dresden with one stroke." Though British bombers had been  
mostly responsible for the firebombing, US forces became the focus of antipathy. In a  
brochure on the exhibit, the TMD proclaimed that its work was "only possible" under  
peaceful conditions. The danger to peace, however, was  

discernable in the views of US President Reagan, who believes that a  
atomic war limited only within Europe is possible. Therefore, we will  
exert all of our strength to see that peace prevails, and that the newly  
resurrected beauty of Dresden declares the peaceful intentions of its  
inhabitants to the entire world.  

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108 Ibid.  
109 Technisches Museum Dresden, "Drehbuch: Sonderausstellung 'Unterhaltungstechnik Gestern-Heute.'"  
110 Ibid.  
111 Ibid.
Ultimately, the exhibit avoided Dresden’s, or eastern German, complicity in the war. They reflected instead Soviet- and SED-guided policies that encouraged *Abgrenzung* with the West, but at the cost of washing away the Nazi past.\textsuperscript{112} With Dresden now “innocent,” institutions of the educational system like the TMD could assume the moral high ground, and made the unambiguous antipathy toward capitalist countries acceptable.

However, no amount of guidance and posturing could suppress the contradictions within socialist peace politics that became increasingly apparent during the 1980s. Staff members maintained that the state cared for citizens, but there was a disastrous environmental situation taking place beyond museum walls. By the end of the 1980s, the smell of burning lignite, or brown coal, was prevalent particularly in the south near Dresden, and ecological reports associated the conditions to an increase of respiratory tumors and circulatory diseases. Compared to West Germany, sulphur dioxide particles in the air were four to five times higher and fine dust six to seven. Experts also estimated that 90 percent of trees in the GDR had sustained some level of atmospheric damage.\textsuperscript{113} In technological historian Weber’s opinion, it was a telling indication of the state and the intelligentsia who served it that, given the state of environmental disaster, historians in particular did little to interfere.\textsuperscript{114}

Moreover, the argument that advanced technology was peaceful, for example, denied both its intricate ties to military applications and the socialist quest for tactical domination. Even new and improved designs for the TMD shortly before 1989/90 barely


\textsuperscript{113} “East Germany: Country Report,” *The Economist Intelligence Unit*, no. 3 (1989). Moreover, the GDR was leading hazardous waste dump for Europe, Allen, *Germany East: Dissent and Opposition*.

\textsuperscript{114} Weber and Engelskirchen, *Streit um die Technikgeschichte*, 322.
recognized the connection. In his proposal, Leuschner’s successor Peter Bartsch envisioned a new core for the museum around the progressive, chronological story of technology, including episodes on “The Transition from Capitalism to Socialism” or the GDR as pinnacle in “Socialism on German Soil.” Among the additions outlined in the proposal were the “world-historical victory of the Soviet Union [of World War II], the methodological emergence of the socialist world system, COMECON, … the [USSR’s] breaking of the atomic bomb monopoly, a soviet atomic reactor, and the first artificial satellite.” However, the museum did not then discuss the conflict of military technology with peace politics. If the world was as interconnected as the museum proposed, then the balance – or tension – between ideological promises and political practice was all the more difficult to maintain.

*Lessons of interconnectivity in a world of microelectronics*

The power of cybernetics, whether or not it enjoyed official sanction in the GDR, lay in the compelling metaphors it offered for a technological age. When nation became system, each member then gained significance in a totality that produced concrete results. Though a cybernetic model was not explicitly followed in the TMD, the logic of cybernetics was unavoidable in a locale that pursued computer excellence. Dresden was not only the GDR’s hub for camera technology, but also computing technology in the post-war years, and computers were deemed the kernel of the “scientific-technological revolution.” By connecting the local to the global, and individual to system, the

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116 Ibid.
museum redefined the microcosm-macrocosm model for socialism. In centuries past, the museum was a collection that revealed "the Great Chain of Being," and showed how the tiniest objects of nature revealed larger cosmic order.\textsuperscript{118} Now, the TMD hoped to promote the productivity of others in areas of high computing through making visitors aware of the reality of interconnectivity.

![Diagram](image)


After participating in a 1978 conference for technical museum personnel, a TMD staff member thought that “the notion that all things are connected needs to be intensified in our institution. It is not only important to show specific consequences of development, but also the connections to today’s situation (social conditions, etc.) should be delineated.”\textsuperscript{119} Yet an intensification of the theme of interconnectivity in this museum is difficult to imagine, considering that it had from the outset, for instance, associated mathematics and computing with the foundations of civilization. The might of the


\textsuperscript{119} "P." "Dienstreisebericht Schwerin über die Schulung pädagogischer Mitarbeiter, 12.-14.12.78," 2.
ancient world, such as "pyramids, temples, and other buildings of these cultures could not have emerged without math" according to TMD scripts, which "decisively influenced every important achievement of humanity." The museum restated the claim while presenting an abacus in their 1981 brochure on "The Path towards Data Processing," averring that "numbers are the foundation of all calculation, [and] cultures of past millennia show us that humans since the dawn of time have always been engaged with mathematics."  

Figure 18  Introductory room of the TMD  The first room of the museum opened with a display on "Numbers: The Building Blocks of all Calculations" (above the Greek figure) before moving into calculating (far right), and then computing technologies. Technisches Museum Dresden, "Brigadebuch: 5 Jahre Polytechnisches Museum Dresden 1971," TMD Brigadebuch 1.

Museum literature tied computers to the GDR not merely in local, but also ethnic terms. Dresden was the site of the first developments in electronic calculating

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120 Technisches Museum Dresden, "Museum Führungs texte, Drehbücher," "Tafel 9."
121 Technisches Museum Dresden, "Der Weg zur EDV (Elektronische Datenverarbeitung)," 1981, 2.
technologies in the GDR, since N. Joachim Lehmann at TH Dresden built the country's first computer, "Dresden 1" or D1, in 1956.\textsuperscript{122} As scientists began to centralize and consolidate computer research efforts for the nation, they formed the Robotron concern in Dresden in 1969. VEB Robotron was also responsible for coordinating an international socialist project called the "Unified System of Electronic Computing Technologies" (ESER).\textsuperscript{123} Highlighting the city's role in the history of computing, the TMD also underscored the German connection to computer technology. The computer pioneer Konrad Zuse had his place in the chronology with his Z3 of 1941, the first tape-stored, program-controlled computer.\textsuperscript{124} Even United States citizens deserved mention when they were German descendants. Hermann Hollerith, "an American engineer of German extraction," for example, was hailed for his idea to use punchcards for data memory.\textsuperscript{125}

Establishing a connection between computer technology and the GDR was important practically and ideologically. The beauty of the international ESER effort, as described by a museum brochure, was its particular virtues in computer flexibility, accessibility, and a "programming capability... that allowed all devices to couple with a central unity, [or] the uniformity of constructive and technological solutions."\textsuperscript{126} Just in case the references to the GDR's - or the entire socialist bloc's - own centralized structure were unclear, the TMD underscored the point: "[ESER's] cooperative labor in

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\textsuperscript{124} Technisches Museum Dresden, "Der Weg zur EDV." Although whether this was in fact the "first computer" is up for debate; it was not general purpose, and did not directly influence today's computer. However, debates over this claim, which include the US and UK, has much to do with national histories itself. Another example of this, in film and television history, is Andreas Fickers and Frank Kessler, "Techno-Nationalist Tales of Glory and Failure: Writing the History of Inventions in Early Film and Television," \textit{MIT4 (Fourth Media in Transition Conference) 6-8 May 2005}, http://web.mit.edu/commforum/mit4/subs/mit4_agenda.html 2005."

\textsuperscript{125} Technisches Museum Dresden, "Der Weg zur EDV," 6.

\textsuperscript{126} Ibid., 13.
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the area of electronic computing technology is a vivid example of employing the advantages of the socialist economic system and the development of economic integration among the socialist countries.” The possibilities and rewards for successful integration were also obvious. “Microelectronics are creating a new way [to solve complicated tasks]” that, according to the TMD, “revolutioniz[es] our life. It has become a tool that will ensure a high economic growth in our time.”\textsuperscript{127}

On the most functional level, an interconnected outlook rationalized the unity of human and machine in the pursuit of productivity. Automation itself was the planners’ response to increasing limits upon economic options.\textsuperscript{128} However, as TMD expositions on data processing warned, the microelectronic transformation would not occur independently but demanded true unity with machines, and therefore involved the coordination of human efforts. “It should not be thought,” cautioned the museum, “that the application of the speed [of computing technology] will alone achieve more.”\textsuperscript{129} Workers themselves had to also adjust in order to create the maximum output: “Much more important is the coordination of tempo in the ‘working unity’ (Arbeitseinheiten). It must reach optimal balance.”\textsuperscript{130} This echoed Leuschner’s early belief that the task of all technology museums was to work closely and reach an “optimal” collaboration with career and work agencies.\textsuperscript{131} To help achieve “socialist intensification,” a political catchphrase that promised greater production in the face of a dearth of labor and resources, TMD sought to raise workers’ consciousness.\textsuperscript{132} Specifically, by clarifying

\textsuperscript{127} Ibid., 14.
\textsuperscript{128} Geipel, "Politics and Computers in the Honecker Era."
\textsuperscript{129} Technisches Museum Dresden, "Museum Führungs texte, Drehbücher."
\textsuperscript{130} Ibid. Also a reference to Marx’s Kapital.
\textsuperscript{131} Leuschner, "Technische Revolution und Bildung", 107.
\textsuperscript{132} Leuschner, "Konzeption des Technischen Museums Dresden für die Jahre 1977-1990." Gary Geipel describes the principle of intensification in the following fashion: “faced with rising energy prices,
the historical roots of production in the framework of socialist economics, people could better integrate themselves in the economic process – especially in Dresden’s computer community – and thus become more productive.\textsuperscript{133}

How the TMD communicated systemic relationships and work ethics to viewers in an appealing and readily accessible way was apparent in what also proved to be its most popular exhibitions: technological microminiatures. In 1975 and in 1978, two special exhibitions from Moscow secured the museum its highest visiting statistics. The first exhibition, “HUGE (when using a magnifying glass!)” (\textit{Unter den Lupe ganz gross!}), not only had people lined up around the block, but won Leuschner an interview on television.\textsuperscript{134} The second exhibit of folk-artist Nikolai Sergeevich Siadzistii’s work drew 48,000 visitors and contributed to the TMD’s highest record year.\textsuperscript{135} On display were hand-sculpted microminiatures so delicate that their details were barely visible to the naked eye. The fruit of Siadzistii’s fine skills fit well with the museum’s focus on microelectronics. According to the exhibition, the finesse and manipulation of Siadzistii’s art was a marriage of science and technology, or know-how and applicability.

\begin{itemize}
\item[133] Leuschner, "Konzeption des Technischen Museums Dresden für die Jahre 1977-1990."
\item[134] Technisches Museum Dresden, "Brigadebuch 3."
\item[135] My colleague Natalia Bayer helpfully provided the transliteration of the artist’s name in American English; another one is Mikola Sergeevich Siadzistii.
\end{itemize}
Figure 19 "So many people stood in front of our museum!"

A snapshot from the Brigade Scrapbooks during the first microminiature guest exhibition, Technisches Museum Dresden, "Brigadebuch 3," 3.

Not only did the small wonders signify the genius of civilization itself, but also the limitless possibilities of human achievement in a malleable world. "The art of microminiatures," exhibition visitors learned, "was as old as human civilization."136 Alluding to intricate, 2,000-year-old filigree-work on display in museums around the world, the museum declared that they "awakened even today amazement with the puzzling delicacy of [their] execution."137 With their ability to astound, microminiatures were "a visible refutation of the earlier ideas about human limitation." Moreover, they showed not only that did human achievement and the natural world go hand-in-hand, but achieved together something better. Miniatures, the museum argued, "confirm the belief in practically unlimited human possibilities in the areas of building micromachines and the knowledge of the animate and inanimate microworld. In this manner, microminiatures correspond with technical and scientific progress."138

136 Technisches Museum Dresden, "Mikrominiaturen," 2 March 1978, TMD Ordner Neuererinformation (crossed out). Though one note says 1975, this appears to be a typo, since 1978 is confirmed in three other locations, see Technisches Museum Dresden, "Brigadebuch 6."
137 Technisches Museum Dresden, "Mikrominiaturen."
138 Ibid., 8-9.
Like the exhibition on computing technology, the exhibition on miniatures mentioned the need for productive labor. Firstly, exhibition liner notes pointed out that the artist’s extensive knowledge about different materials was of great practical significance, since it helped Siadzistii to manufacture the smallest of parts and tools.\textsuperscript{139} Moreover, the exhibition taught that scientific progress or human limitlessness could not happen without effort. In the artist Siadzistii’s own words, what was needed above all for his creations was “great skill and ability, diligence, and perseverance. ... ability alone has no effect without work.”\textsuperscript{140} Knowledge and effort were lessons especially suited to the microindustries of Dresden. Serving as a kind of socialist citizen’s call to action, the morals of miniatures just skirted the standard proclamations about the inevitability of a socialist world.

In fact, the laws of productivity and human achievement did not work according to the principles represented in the museum, at least for the GDR’s computing industry. First and foremost was the “irony” of GDR computer production: although the country manufactured most of its own computers and chips in an effort to be self-sustaining, the effort required a dependence on the world that actually increased with time.\textsuperscript{141} The drive towards dominance in the fields of computing technology began under Honecker with the tenth party congress in 1981, and intensified in 1986. However, GDR engineers were never able to accomplish more than reverse-engineering, all of which still required vast amounts of espionage and money. Embargoes meant that 90 percent of the microelectronic technological innovations that “KoKo,” the GDR’s commercial coordination bureau for the procurement of foreign exchange (Kommerzielle

\textsuperscript{139} Ibid.
\textsuperscript{140} Ibid.
Koordinierung), acquired were illegal. Unsurprisingly, Robotron was a major beneficiary. Former KoKo employee and defector Werner Stiller went so far as to call Gerhard Arnold, a West German employee of IBM-Stuttgart, the “father of computing in the GDR.” In the pursuit of the one-megabit chip, East Germany spent 14 billion marks in the late 1980s, money desperately needed for a host of other purposes, but to no success. Given the hard economic situation, the GDR then used its computing products for trade, primarily with the USSR. Robotron’s sales in the last half of the 1980s reached 3 billion marks, or 5 percent of the GDR’s entire trade volume, with two-thirds of these sales exported. Not much was left for East German citizens to enjoy, yet again leaving the country on the poorer end of the economics of interconnectivity.

*Feedback and entropy in the socialist Weltanschauung*

Cybernetics initially promised the coordination and direction of both human and computerized systems toward specified ends. However, even in originator Wiener’s own view, the applicability of cybernetics to human systems was not predictable. As he wrote in his *God and Golem, Inc.*, which won the US National Book Award in 1965, “the social sciences are a bad proving ground for the ideas of cybernetics – far worse than the biological sciences, where the runs are made under conditions that are far more uniform on their own proper scale of time.” By this, Wiener did not mean that the ideas of cybernetics were inapplicable to social sciences, such as sociology or economics.

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143 Ibid., 111. The GDR sent two-thirds of all exports to the USSR.
144 Ibid.
146 Wiener, *God and Golem, Inc.*
However, the “formless” nature of those fields first required the testing of cybernetic principles in other, harder, venues like engineering or biology.

The words of caution, however, did not prevent people from trying to apply cybernetic ideas to solve human behavior, like trying to mediate an obvious disjuncture between the pretty pictures of socialism that the party – or museums – painted and cold facts of everyday reality. If museum educators were correct about the cybernetic educational tactics they employed and the worldview they portrayed, the result was supposed to entail not only an emotional response of loyalty on the part of the viewer, but also increased productivity in the region. However, just as the congruence between cybernetic systems and a socialist worldview was never straightforward, neither was viewer response. Visitors could not always be gauged and even when they could, they did not refrain from criticism. This called into question the very possibility of the museum to accomplish its purposes.

In certain measurable terms, the feedback that the TMD received was rather poor, which confirmed that it never attained large significance. Even during the best years of 1975 and 1978, the number of visitors never broke 67,000.147 This was all visitors for a year, including not only special exhibitions, but also lectures and other events held by the museum. External evaluations of the museum corresponded to the insignificant numbers. An East Berlin department leader in the Ministry of Culture, Werner Schmeichler, had in

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fact included the TMD in prospective developments for the most important museums in
the GDR in 1975. Yet the developments never came through and, thus, the TMD
never made the high-class Group I list. Among technical museums, only the
Verkehrsmuseum of Dresden and the Postmuseum in Berlin received the honor. Finally,
although precise demographics were impossible to know because of undifferentiated
ticket pricing, youth and children appeared to be the most regular visitors. While this
was expected given the educational focus of the museum, it also meant that the museum
failed to garner the larger public to which it aspired.

Numbers were in fact important. It was one of the ways that the museum justified
continued financial and resource support from the state. Yearly budgets approximated
the expected number of visitors – a practice important to a planned economy and system
– and reports at the calendar’s end would explain reasons for failed or surpassed
expectations. Thus, for instance, when the staff realized in 1986 at the half-year point
that fewer numbers of visitors were turning out than planned, they took measures such as
active canvassing during cultural fairs in the region, intensifying public relations efforts,
and giving press interviews about the museum. In the end, when planned targets were
“not entirely realized,” the director defended the shortcoming. In this instance, Bartsch
attributed the shortcoming to the closing of their photo gallery, an above average number
of sick days, and maternity leaves. For these reasons, the director still felt justified in
asking for the prize funds normally awarded for meeting their yearly goals.

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149 See for example a 1976 report in Leuschner, "Das Technische Museum Dresden (10 Jahre)."
151 Ibid., 1-2.
152 Ibid.
Though the museum may have fallen short in areas of quantity, this did not necessarily doom the quality of their efforts, or the attainment of their educational and ideological goals with the public. Indeed, Leuschner noted that guestbooks “very positively appraised” the exhibitions, and on the whole, responses were positive – though frequently expressed in a formulaic manner.\textsuperscript{153} Moreover, as a result of Dresden’s international profile, the TMD enjoyed visitors from all over the world and on both sides of the curtain, including the U.S., France, Vietnam, Poland, Hungary, Denmark, and Japan.\textsuperscript{154} Even from non-socialist countries, there were often favorable responses. Since these visitors were often members of their national communist party, main ideological conflicts were at least not an issue.

Yet not all expressed feedback was positive. For example, on the occasion of the Soviet Space Exploration exhibition, two viewers complained that the museum presented nothing that they had not already seen in the press.\textsuperscript{155} Though Dresden was one the few districts of the GDR in which television transmissions from the West were all but impossible to receive – the region was known as the “Valley of the Clueless” (”\textit{Tal der Ahnungslosen}”) – residents still managed to keep abreast of news.\textsuperscript{156} More to the point, they understood when there was a \textit{lack} of information, the providing of which was the very purpose of a technological educational institution. One guest, a leader of the local Cultural Association group (Kulturbund IG) for science fiction, complained that the exhibition was “too general and piecemeal,” and that the photo essays should have been

\textsuperscript{153} Leuschner, ”Das Technische Museum Dresden (10 Jahre).”

\textsuperscript{154} Technisches Museum Dresden, ”Gästebuch 2”; Technisches Museum Dresden, ”Gästebuch 3”; Technisches Museum Dresden, ”Gästebuch 4.”

\textsuperscript{155} Technisches Museum Dresden, ”Gästebuch 1.”

\textsuperscript{156} Despite valley residents’ “ignorance,” they were no more trusting with regards to GDR news sources. Viewers recognized hyperbole, omissions and the like easily, Meyen and Nawratil, ”The Viewers.”
more extensive. Instead, he would have really liked a comparison with the research in the USA and other "space exploring nations." A whole group of visitors went even further, signing that they were "disappointed" and even criticized the exhibit's consistency. Not only did they find the exhibition "unworthy" of some of the models displayed – assumedly those from the USSR – but also thought that at least half of the photos did not correspond to the exhibition theme, though they had made the exhibit most interesting. Regarding the permanent exhibitions, it was native visitors, even children, who proved to be the most critical of deficiencies. An entire classroom in 1986 wrote of their visit to the "structure," their term from the building, that despite some interest in the musical devices, they "didn't like it... it could be better!! (too small for many visitors)."

It was probably expected that the efficacy of the museum's message left something to be desired in a system that controlled even the use of paper. Not merely did the Ministry of Culture issue guidelines on its usage ("The most frugal usage of materials... is a permanent imperative of socialist management"), but paper statistics had their own place in the yearly accounting. Even in the manufacture of their own brochures and other educational devices museum workers were constrained, as attested by the few, brief, and fragile exemplars that remain. Besides these limitations, museum personnel had to endure crumbling buildings, darkroom breakdowns, and a perpetual lack of staff as well. This was the case in all Dresden, as the absence of funds and continued

157 Kramer, on the 'Sowjetische Raumfahrt' exhibition, 5 April 1970, TMD Gästebuch 1.
158 Ibid.
159 Technisches Museum Dresden, "Gästebuch 1," 15.
160 Technisches Museum Dresden, "Gästebuch 3."
neglect of structures would prove, in the words of one ethnographer, "more significant for the disintegration of the city] than the [1945] bombing" itself. 162 Though the museum finally received a new location, and moved from Friedrich-Engels-Strasse 15 to Reinhold-Becker-Strasse 5 on 15 September 1989, it took place amidst a collapsing state. 163 For a political system once fond of the cybernetic metaphor, entropy comes to mind.

Despite the attempts to steer and control interpretation in the TMD, feedback showed that to some measure, educators could not achieve their objectives because of contradictions among their messages, the visitor’s access to other media, and even the viewer’s own evaluation of reality. A perfect example of this conflict in TMD exhibitions was the display of camera surveillance technology. In a brochure for the permanent collection, the museum highlighted that its collection also included secret and detective cameras alongside those for everyday, personal use. 164 Perhaps the museum’s allusion was innocent. However, given that State Security (Stasi) and its affiliates had ten percent of the population at one time or another under surveillance, the connection must have occurred to some viewers within a society keenly aware of the secret police. 165 The bitter truth of camera surveillance, for those behind and before the apparatus, was that the knowledge of being watched might control behavior, but it could not foster affection or loyalty. 166

163 Technisches Museum Dresden, "Gästebuch 2."
165 There were 128 kilometers of surveillance case files at the GDR’s end, Pommerin, introduction to Culture in the Federal Republic, 70.
166 As political scientist Karl Kahrs put it in 1972, “feedback is part of the deal that the Party struck to achieve functional efficiency. Information keeps coming in. Even if the ‘wrong’ messages are screened out time and again, a repressed awareness of facts and findings is accumulated that may back up some day
In another example of steering failure, appeals to local sensibilities and peace politics may have ultimately countered attempts to inculcate loyalty. Remembrance of the Dresden firebombing was an annual event that was originally intended to foster antagonism with West, not East. Gathering at the ruins of Dresden’s once landmark church, the Frauenkirche, museum staff joined in the memorial ceremonies along with...
thousands of others. Staff recorded in the yearly scrapbook, for example, a speech of Günther Drefal, professor and President of the National Peace Council, who told his listeners that the “threat to our socialist community presented by the reactionary NATO-circle grows larger and larger” and “only the peaceful powers of the world, if unified, can stop the confrontational course of the USA.”167 The museum chronicler ended the day’s events with her own proclamation: “The fate of Dresden should never be repeated! Europe should not and will not become another Hiroshima!”168

Yet for many, as ties between technology and destruction became hot issues in the 1980s, the logic of peace transformed the Dresden bombing into a rallying point for political opposition. What the ideologically correct scrapbooks did not recount was an especially important gathering to commemorate the bombing that took place the year before. The Dresden Peace Forum, organized in January 1982 by dissident pastor Rainer Eppelmann, collected 2,000 signatures demanding a peaceful alternative to the military training that had become a mandatory part of school education.169 On the evening of the bombing’s anniversary, 3,000 youths gathered to hold a candlelight vigil and 6,000 locals came together the next morning, singing “Give Peace a Chance” and “We Shall Overcome.”170 The famed response of Minister for People’s Education Margot Honecker was her organization of a youth (FDJ) rally that bore the slogan “Peace must be armed.” Nevertheless, the peace movement gained strength in the next years, and Eppelmann became an important figure in the events of 1989. Upholding the paradoxical traditions of revolution and conformity in Saxon, Dresden itself stepped beyond the boundaries of

168 Ibid.
169 For more details on militarization, see Chapter 2.
170 Allen, Germany East, 106; Rodden, Repainting the Little Red Schoolhouse, 156.
its typically acquiescent character on 3 October of that year and was an important site of protest against the closing of the Czech border.  

Museums like the Technisches Museum Dresden continued to push utopian visions of technology and society, and sought the “abolition of tragedy” while their very institutions disintegrated. Initially, systems ideas and cybernetics seemed adept at explaining the superiority of socialist interpretations of the world. Particularly seductive was the idea of the human society that could be run as efficiently as a well-oiled machine. In Dresden, the newest technological and scientific theories involving computers, cybernetics, and the whole world of interconnected micro-processes were even tickets to the realization of socialism. However, the dynamism of systems theory challenged the strictures of a consciously planned or organized society. Thus, cybernetics, taken seriously, also provided the possibility for resisting static or imposed authoritarianism.

In the TMD itself, these tensions were a part of its very structure. On the one hand, museum staff sought to imbue their visitors with a far-reaching socialist Weltanschauung, or worldview. Concerned with the quality of life for their visiting public, they framed technology in universal terms, emphasized interdependence and participation, and hoped that their efforts would catalyze citizens to act for the grand socialist system. Individuals could function like cogs in the larger world machine, which also encompassed nature and all humanity. On the other hand, the TMD was also a small, intimate museum, characterized by a local identity, in which personnel emphasized strong connections to the community and values like peace and affection. However,

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171 Ten Dyke, Dresden: Paradoxes of Memory in History.
these values were at times not only contrary to the political goals of the museum and the state. They also validated the individual perceptions and experience as an appropriate gauge of existence, thereby unwittingly providing a counter to museum efforts.

The material and political dynamics of interdependence also posed a problem for both state and museum, because above all else, the GDR located the outside world as a source of legitimacy. East German politicians were constantly aware of the perceptions that others had of the GDR, and this insecurity was a problem as the futile attempts to found an independent computing industry proved. Abandoning the failed project was apparently impossible, indicating perhaps what Germanist Benjamin Robinson called "socialism's insecure culture." By this, the GDR “characteristically doubted its underlying structural integrity – its differentia specifica— just seriously enough to throw into question whether or not it was really —qualitatively, quantitatively and dialectically — distinct from capitalism." Yet East Germany also needed the grand contest. Noting a larger contradiction of “totalitarian systems” in their desires for foreign influence and isolationism, social scientists Yakov Rabkin and Elena Mirskya made the following conclusions about the socialist worldview:

while ideologies of scientism and totalitarianism offer a temptation of total control, of human omnipotence, they also provide a quasi-religious solace of participation in gigantic and therefore collective projects to a populace suffering from “atomization, impotence and despair.”

Thus, the effort to control science through ideology also proved at least conflicting, if not contradictory to the dictates that science demanded itself. Even West German theologians Rudolf Bultmann and Karl Jaspers felt after the war that an

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advantage of modern science was that it could not support a totalizing worldview.\textsuperscript{174} In the GDR, however, economics became a matter of “political-ideological steering” after the abandonment of real technological innovation under the New Economic System.\textsuperscript{175} Yet a generation after Nazism, even mathematicians and scientists fell into the ideological view. The increased regard for math and science on the part of the SED was appealing to mathematicians after their neglect under National Socialism, but not the party’s increased interference. The new generation of science – and party – functionaries, however, made the connection between an antifascist, progressive Weltanschauung and the advance of knowledge.\textsuperscript{176} Having accepted the terms of success set by the West, planners and scientists alike were perhaps blinded to alternative economic strategies in the industries that the GDR that might have had a measure of success.\textsuperscript{177} At least in the GDR, events proved that ideology could not steer science well enough. Though party leaders disallowed the scientific community its own research agenda, directing it instead to fulfill the consumer needs of the public, the irony was that the community was never sufficiently innovative to anticipate consumer want – GDR technology was forever chasing after developments in the West.\textsuperscript{178}

When it came to the GDR’s own citizens, the praises of interconnected technology fell on the deaf ears of a populace that still lacked everyday items. While Honecker was proclaiming the advances in microcomputing, workers noted instead the absence of tool parts and decrepit machinery in factories. One consumer complained in

\textsuperscript{174} Referencing Myth and Christianity: An Inquiry into the Possibility of Religion without Myth, in Ibid.

\textsuperscript{175} Robinson, "Socialism’s Other Modernity," 710.


\textsuperscript{177} Geipel, "Politics and Computers in the Honecker Era."

\textsuperscript{178} Eckart Förtsch, "Science, Higher Education, and Technology Policy," in Mackrakis and Hoffmann, Science under Socialism.
dark-comic fashion, "We have trouble filling our shopping baskets. Pretty soon they'll just give us all a microchip instead of something to eat."\textsuperscript{179} Of the visitors to the TMD, feedback showed interconnectivity and cybernetics to be ambivalent tools. While it is difficult to measure the effectiveness of technology educators or know how much students and visitors took these visions to heart, residents of Dresden belonged to multiple spheres with competing ideals. Dissenters for peace and the environment in Dresden, then, were also tuned into national ecological groups or transnational movements to end the Cold War. In moments of protest, they became "citizens of the planet," rather than the state.\textsuperscript{180} Regarding the attempt both by the museum and the GDR to seek validation from a national, and even international, community, and also to steer the community, Christa Wolf's computer summed up the contradiction most eloquently:

QUESTION WRONGLY POSED. NOT POSSIBLE TO UNIFY MUTUALLY EXCLUSIVE FEEDBACK CONTROL SYSTEMS IN A SINGLE FUNCTIONING SYSTEM. BEST WISHES, HEINRICH.

Because a republic ultimately can be stable only insofar as the principles of its constitution take root in the convictions and practices of its citizens.

Such a mentality can be formed only within the context of a free and combative political culture; it emerges through criticism and confrontations in the arena of a public sphere that has not lost heart, is still accessible to arguments, and has not been ruined by commercial television.

– Jürgen Habermas, *A Berlin Republic*

**Chapter 4 • Alternatives**

**The marketplace as a “third” way? West Berlin’s Museum of Transportation and Technology**

Founded in a city defined by decades of conflict, the Museum für Verkehr und Technik (MVT), or Museum of Transportation and Technology, recognized the complicated significance of technology. In the divisive context of Berlin, the inextricable connections between technology and democracy were clear. Among the images that stood out in both personal and public memories were the gleaming planes of the Berlin Airlift, during which US bombers literally kept the Western sector “fed and free” against the Soviet blockade of 1948-49. The same technology that destroyed it several years prior now saved it through the continued supplies of airplanes. Thus, when the plans for the MVT took flight in 1983, museum architects consciously avoided a triumphant, progressive tale of technology.

Instead of the optimistic, liberal democratic expositions of the Deutsches Museum or the triumphalist depictions of socialist technology in the East, Berlin designers tried another, or – to use the parlance of political alternative – “third” way. ¹ Günther

¹ Sociologist Krishan Kumar defines the third way as between the “atomization of competitive market society”, on the one side, and “a state dominated existence”, on the other,” visible in the works of Henri de Saint-Simon, August Comte, Alexis de Tocqueville, Emile Durkheim, Ferdinand Tönnies, and Talcott Parsons, Krishan Kumar, "Civil Society," 380.
Gottmann, former head of the Deutsches Museum’s pedagogy department and the MVT’s first director, articulated the new vision.\(^2\) Gottmann’s break with the Deutsches Museum was not only professional, but also conceptual. In contrast to the encyclopedic vision of Munich’s institution, Gottmann relished the fact that his new museum had no pervading story or guiding moral when it came to the complicated trajectory or implications of technology. “It should be so,” he declared in response to his critics, “since a museum is no three-dimensional primer in which the second page can only be understood after studying the first.” Rather, to Gottmann, a museum was an “open marketplace with many stands among which the visitor can steer himself...go where and do whatever he wants, [and] not what a museum-didactic totalitarianism prescribes to him.”\(^3\)

The architects of the MVT avoided making overly utopian promises about technology, but this did not mean that they abandoned the task of fostering democratic values. In treating visitors as mature voters who could navigate technological issues for themselves, the hope remained that museum education would support the workings of a strong democracy. However, if technology was meant to be ambiguous in this “open marketplace,” it also took on the character of an overarching and beautiful web that made navigation difficult and even obfuscated human agency. A network of technological connections could in fact paralyze visitor choice, since the difference between “good” and “bad” technology was unclear and the prospect of control over technology was dubious. Furthermore, Gottmann’s use of the market analogy may have been more adept than he intended, because the problem of fostering critical independence in the museum

\(^2\) For Gottmann’s early career including a stint as a Catholic professor, his film documentary of Brazil back alleys, and pedagogy at the Deutsches Museum, see Chapter 1.

was also challenged by the presence of corporate advertising. In addition, reminders of West Berlin’s geopolitical, or Allied, commitments were present in the MVT as well. In the face of great difficulties, Berlin’s museum sought to find a way between the ideologized and apolitical education and the extremes of East and West.⁴

_A museum of technology for contentious Berlin_

Currency reforms among the Western sectors in June 1948 had been responsible for the shiny vessels of the Berlin Airlift. These reforms were the tipping point in a series of escalating exchanges among the former allies, or more specifically, between the USSR and the Americans, British, and French. The act of creating a unified means of exchange among the Western occupied territories incorporated them simultaneously into the economic systems of the Western allies, and thus entrenched political division against the USSR. In response, the Soviet administration, which exercised jurisdiction over lines of transport into Berlin, blockaded all traffic, including foodstuffs, from entering or departing West Berlin (except through their own eastern channels). The predominantly American retort to the Berlin Blockade was an “air bridge,” in which US forces supplied the daily needs of West Berliners through airplanes. The standoff lasted for more than nine months and 275,000 flights that provided between 3,800 (November) to 6,000 (March) tons of food and coal per day. Due to the airlift’s success, many West Berliners even gained weight that winter. The hostilities were resolved partly by the formal creation of West and East German states in, respectively, May and October 1949.⁵

⁴ In documenting the creation of the MVT, there are limitations in source material. As will become clear, bursts of funding meant that museum personnel quickly pushed through plans that had been waiting in the wings when monies were available, and did not spend much time documenting the process, Jörg Schmaluß, conversation with author, 30 April 2004.
⁵ Bark and Gress, _A History of West Germany_, vol. 1; David Clay Large, _Berlin: A Modern History_ (London: Allen Lane, The Penguin Press, 2001), 401-08; Turner, _Germany from Partition to Reunification._
Because of its politically significant location, West Berlin – whether depicted as the doorstep of the Communist world or an island of freedom in a “Red” sea – became a showcase of liberal democracy to the world. Yet it was a rather poor one; having little local industry especially after the war, and precisely because its placement offered little incentive for economic investment, the city was largely kept afloat on federal and other external subsidies. Just after the Berlin Wall went up in 1961, even people were scarce, with 300 persons leaving the city each day. Nonetheless, West German politicians intended that their Berlin would display the benefits of democracy, which included the flowering of a “free” culture. Creating a cultural beacon for the East ranged from the display of glittering wares in department stores like Kaufhaus des Westens (Department Store of the West) on the “Ku’damm” window boulevard to institutions like the newly founded Free University of Berlin. The former example exemplified the emergence of a “consumer society” that was unprecedented in the history of the world, while the latter in fact demonstrated why West Berlin was a problematic exemplar for liberal democratic Cold Warriors. Given the maze of legal strictures that governed West Berlin, residents were exempt from army conscription and made the university a very attractive gathering

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7 Large, *Berlin*, 461. The statistic is for 1962.

8 The Free University (FU) was founded in 1948 and up until 1961, East Berlin students could attend the “innovative” FU, Suri, *The Cultural Contradictions of Cold War Education."

9 Historian of technology Wolfgang König argues that the consumer society, or the profound qualitative difference in society wrought by the quantitative explosion of industrialized production, only occurred in the twentieth, and even mid-twentieth, century for western Germany, Wolfgang König, *Geschichte der Konsumgesellschaft* (Stuttgart: Franz Steiner Verlag, 2000).
place for youths at odds with the system. As these and other constituents began to feel
that the democracy of West Berlin was only for “show,” the Free University became a
ready hotbed for all kinds of political protest, including anti-US demonstrations, to the
delight of East German party ideologues.\footnote{Large, Berlin, 482.}

East Berlin retained the lion’s share of the city’s cultural landscape and museums
in the division. Humboldt University, the grand (protestant) Cathedral on the Unter den
Linden promenade of architect Karl Friedrich Schinkel, the Alexanderplatz described
famously by writer Alfred Döblin – all these fell on the eastern side of the city. The
GDR inherited the royal Hohenzollern Palace too, which Ulbricht promptly demolished
in order to underscore the socialist state’s departure from the past.\footnote{Ibid., 422.}
In addition, many of Berlin’s surviving world-renowned museums and collections fell on the eastern side of
the line. These were significant institutions, including the reconstruction of the ancient
Greek Pergamon Altar and its home, the “Museum Island.”\footnote{Given the funding situation in the GDR, however, many cultural sites like the Pergamon Altar fell into disrepair. The Museum Island, whose five museums were constructed between 1824 and 1930, became a UNESCO world heritage site in 1999, UNESCO World Heritage Centre, “Museuminsel (Museum Island), Berlin,” http://whc.unesco.org/en/list/896/ (accessed 20 April 2006).}
This did not mean that West Berlin was entirely bereft; the palace of Charlottenburg and nearby art collections
in the very Western part of the city took on a new significance, however.\footnote{Large, Berlin. Large notes that during reconstruction, the Americans paid close attention to the outcry that followed Ulbricht’s demolition of the palace.}

Berlin’s former cultural landscape had also included some museums of
technology, though no single institution devoted to the theme of technology at large. For
a city once so characterized by technology that it was known as “Elektropolis,” this was a
sad state of affairs. In this earlier era, Berlin had witnessed pioneering developments in
urban transportation. The suburb of Lichterfelde implemented the world’s first electric
street car in 1881 and, after World War I, Berlin could boast the very first traffic light for automobiles.\textsuperscript{14} After the second World War, however, 26 cubic meters of debris for each of the 3 million remaining inhabitants blanketed the city’s former glory.\textsuperscript{15} Both the Museum of Marine Studies and the Museum of Transportation and Engineering (focused mostly on locomotives) were almost completely destroyed by the wartime bombings. What came closest to a technology museum for the city was the Reichspostmuseum, a museum containing technological developments of the Wilhelmine postal service, but this too became the East’s.\textsuperscript{16}

Once Berlin began to recover, some residents hoped to regain, and even redefine, the technological profile within the city’s museological venues. Initial efforts for a museum of technology dated back to the efforts of a Berlin bureaucrat in 1953.\textsuperscript{17} As Inspector Theodor Bars saw it, most likely given the pressing demand for technological expertise at the beginnings of West Germany’s “economic miracle,” Berlin was in desperate need of a new museum as a resource for engineering and science students in particular.\textsuperscript{18} Though he sought to replace the destroyed technological museums, Bars did not in fact want to replicate these past institutions, especially when it came to their military aspects. Past exhibits of the Museum for Marine Studies and its “exploded

\textsuperscript{14} Large, \textit{Berlin}, 81-86; Schivelbusch, \textit{In a Cold Crater}.
\textsuperscript{15} Schivelbusch, \textit{In a Cold Crater}, 2. Although, as Large notes, Berlin’s glory was tempered by a certain “ugliness” in comparison to the metropoles of Paris, London, and New York.
\textsuperscript{17} Another beginning for a transportation museum was attempted in 1954 by the brother of Professor Lemmer (CDU), Construction director at the Senator’s Office for Construction and Residential Issues, von Dorrer, "Wiederaufbau eines Verkehrsmuseums in Berlin," 9 February 1954.
\textsuperscript{18} Theodor Bars, "Die Idee eines neuen Verkehrsmuseums für Berlin," \textit{Der Bau und die Bauindustrie} 8, no. 22 (1955).
torpedoes, shot-up armor plating, [and] ship grenades” were not desirable at all.\textsuperscript{19}

Rather, the new museum would show the connecting aspects of transportation technology (völkerverbindenden Charakter des Verkehrs), a theme that resonated with the rebuilding of Berlin. In anticipation of the new museum, Inspector Bars reportedly spent all his spare moments making models of transportation, which were veritable “wonderworks of precision” themselves.\textsuperscript{20}

Individuals like Bars came together in 1960 to form the “Society to Rebuild a Transportation Museum in Berlin, Incorporated.” The group was headed by Gerhard Weiler, a member of the Ministry of Transportation, and was not limited to individuals. Among the founding affiliates were also the German Federal Railways (Deutsche Bundesbahn), Berlin Transport Industries Guild, a member of the Chamber of Commerce and Industry Lobby, the Technical University of Berlin, and Lufthansa.\textsuperscript{21} For the next two decades, Weiler presided over the efforts to build a technology museum in Berlin. In the meanwhile, the organization began a permanent exhibition in 1964 within the halls of Urania, a popular science organization.\textsuperscript{22} Yet despite many efforts, the organization was unsuccessful in reaching its goal. To be sure, the Berlin Senate passed a measure in 1960 to create a transportation museum, with the support of the Ministry of Transportation and also the Deutsche Bundesbahn, Lufthansa, and other transportation industries. However,

\textsuperscript{19} Theodor Bars, Letter to Oberbürgermeister Berlin, 24 February 1955, MVT Archive FV 1.
\textsuperscript{21} Gesellschaft für die Wiedererrichtung eines Verkehrsmuseums in Berlin E.V., to Bundesminister für Verkehr Abteilung A in Bonn Dr. Kullman, 11 November 1960, MVT Archive FV 1. Name of the institutions in German: Deutsche Bundesbahn, Deutsche Luftfahrtsammlung Berlin, and Berliner Fuhrwerbe-Innung.
as the city and country encountered economic difficulties in the early 1970s, the project stalled.23

Part of the group’s inability to find backing was that the interests and exhibitions were mainly the stuff of technology enthusiasts, and original plans for the museum certainly had an enthusiastic view of technology.24 “Transportation is crucial to life,” the Society declared, which was “especially clear in West Berlin, whose existence is decidedly dependent upon reliable, functioning access routes and high performance transport carriers.” It seemed obvious to these museum advocates that Berlin was “predestined” to represent the history of transportation within “a museum that is informing, beholden to public discussion, and trend-setting.” “BERLIN NEEDS THIS KIND OF TRANSPORTATION MUSEUM,” the Society cried.25 It was equally clear to the citizen and corporate initiatives that formed the Society that the discussion and display of transportation should include support the continued presence of NATO powers in West Berlin. In the 1960s and 70s, the Society would periodically cooperate with American authorities and organize exhibits that focused on examples of American and British aircraft machinery. On “Open House” days, for example, the organization worked with Berlin Senate Office of Economics and the US Air Force to open Tempelhof Airport – the former landing spot for the Raisin Bombers and the American air base in Berlin as well – to the public.26

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23 "Senatsbeschluss Nr. 1310/60 über Wiedererrichtung eines Verkehrsmuseums," 1960, 1 March.
26 In the early days, even an “Air Bridge” department for the museum was in the works that used gifts from the British and American air forces, Museum für Verkehr und Technik Berlin, "Ergebnisprotokoll über die Vorstands-Sitzung, 3. Mai 1977," 3 May 1977, MVT FV III/12; VMB, Rundschreiben, no. 12 (1964); VMB, Rundschreiben, no. 20 (1966); VMB, Rundschreiben, no. 49 (1977).
However, negative attitudes about technology and politics in this period held powerful sway. With the growing discontent—especially among students—about the educational system and Vietnam War, extraparliamentary forces gained popularity across West Germany and particularly in Berlin. To many, American involvement in Vietnam showed anti-communism to be barbaric. In addition, a number of students, and some instructors, felt that authorities had broken the implicit and explicit promises of democratic education at the Free University. After the building of the Berlin Wall, dissenters argued that a repressive atmosphere had replaced the former political openness of the institution. Thus, when students began disruptive protests in 1966 on the glitzy Ku’damm boulevard, they battled what they considered to be an entire system of political machinations made under the guise of democracy. Tensions escalated through 1967 and 1968 and resulted in the death of one peaceful demonstrator at the hands of the police, and the shooting of student movement leader Rudi Dutschke. To this younger generation, technology remained steeped in violence.

What finally catalyzed the efforts for a technology museum were concerns that reached a new pitch in the late 1970s. Despite the treaties of rapprochement at the beginning of the decade, which involved Berliners intimately, hostility between East and West reemerged by the end. Some aspects of the treaties affected Berlin immediately and beneficially, such as decreased travel restrictions or the 1971 accord that allowed FRG representation for West Berlin. However, the stationing of medium-range missiles on Soviet and West European soil in 1977 heightened tensions once again. Another point of

28 The first major anti-Vietnam demonstration according to Large was on 5 February 1965, but Suri maintains that “particularly” disruptive student protests began in 1966, Large, Berlin, 483; Suri, "The Cultural Contradictions of Cold War Education," 5.
concern was that, in response to the Oil Crisis of 1973, West Germany was attempting to overcome the country’s 96 percent dependence on oil with the building of nuclear power plants.²⁹ Both the political and economic context prompted the increase of anti-nuclear sentiment and the eventual emergence of green parties in the country. In the “island” of West Berlin, the need for alternatives was felt more keenly.

In addition, policy across the West began to respond to technological transformations in ways that provided new impetus for the museum project. In 1972, the US Congress founded the Office of Technology Assessment to “provide early indications of the probable beneficial and adverse impacts of the applications of technology.”³⁰ Responsible for the idea was Connecticut House Representative Emilio Daddario, who then became the first Officer of Technology Assessment under President Richard Nixon.³¹ As Berlin’s Office of the Senator for Science and Art kept track of these developments, the Senate reflected the broad reevaluation of technology and politics taking place in their own discussions.³² This atmosphere created renewed interest in the technology museum, though various Senate offices continued to volley the “museum” – such that it was in 1972 – between themselves, each hoping to be rid of the responsibility.³³ By the end of the 1970s, the Senate finally began planning in earnest for

²⁹ Turner, From Partition to Reunification, 172.
a museum that would unify a number of technological interests present in the region, and address issues of technology at large.\textsuperscript{34} The project finally came under the aegis of the Senator for Cultural Issues in 1978 and 1979.\textsuperscript{35}

Undoubtedly, there was an aspect of rivalry with East Berlin that factored into the renewed drive for a technology museum. The 750\textsuperscript{th} birthday of Berlin, to take place in 1987, was already within sights and the West Berlin politicians and public knew that the Eastern half intended some kind of special show.\textsuperscript{36} Local newspapers also kept their readers abreast of the fact that there was no comparable technological institution on the other side. In fact, one article reported that East Berlin gave up on plans for a railway museum in the mid-1980s, thereby relinquishing its claim over the rail history for the city.\textsuperscript{37} However, as planning for the museum showed, West Berlin's cultural leaders seemed to have taken the political lessons of prior decades to heart. The Senate aimed to have a museum that not only appeared democratic, but actually internalized these ideals. This aspiration corresponded with developments in the museum world that surfaced after 1968: the search for a democratic museum.

\textit{Cultural politics and the democratic museum movement}

A demand for new museum methodologies came out of the late 1960s, when museums around the world began to evaluate their projects more critically and tried to consider the messages that they were sending. Within the international museum organization of ICOM, calls for a revolution within museum structure and philosophy

\textsuperscript{36} Jörg Schmalfuß, conversation with author, 13 May 2004.
reached their height in 1971. When participants at the Paris/Grenoble annual conference cried, “Put the Mona Lisa in the subway, not in the Louvre!” at the core of their protest was the sense that museums were somehow failing their public mission.\textsuperscript{38} The public obligations of museums, then, became the focus of conversations throughout the profession.

In July 1971, the German Research Council (Deutsche Forschungsgemeinschaft, DFG) of West Germany published a “Call for Immediate Aid” that informed the public, and more importantly the state, of an impending crisis regarding the nation’s museums.\textsuperscript{39} In light of what it described as the general “neglect” of museums and the beginnings of what seemed to be a rising trend in visitors, the group of scholars made seven demands. Foremost among them was the formation of a centralized institution on the subject of museum methodology. The council recognized that a relationship with the public was not as easy as it might have once been, for it was not the mere transmission of knowledge that the DFG desired, but effective communication. The Federal Republic, in the organization’s opinion, lacked the kind of information that would produce an “optimal and lasting effect – from the general atmosphere and architectonic composition [of the museum] to the presentation of the lone object – upon its visitor.”\textsuperscript{40} “Immediately” needed was experimental research of “the most modern methods” involving media, which included the fields of learning psychology, information transmission, and mass communications.\textsuperscript{41} 

\textsuperscript{38} Bagli et al, History of ICOM, 26.
\textsuperscript{39} Hermann Auer, Kurt Böhner, Gert von der Osten, Wilhelm Schäfer, Heiner Treinen, and Stepfan Waetzoldt, eds., Denkschrift Museen: Zur Lage der Museen in der Bundesrepublik Deutschland und Berlin (West) (Boppard: Harald Boldt Verlag, 1974), Appendix.
\textsuperscript{40} Ibid., 188.
\textsuperscript{41} Ibid.
As the Council’s call suggested, modern media presented a challenge that necessitated a reconsideration of the museum’s social function.^{42} Whether they liked it or not, museum representatives were competing for audience share against newspapers, TV, and radio, which made the need for reflection about the museum more than academic. Furthermore, the audience itself had grown sophisticated. This population was attuned to the powerful role that media could play in a democratic society. For instance, the *Spiegel* Affair of Adenauer’s downfall was offensive precisely because the state had run roughshod over the freedom of the press, and thereby belied one of the most fundamental rights of an anti-communist polity.^{43} The media, therefore, was an intricate part of cultural politics in democratic states.

There was also an unmistakable geopolitical dimension to the museum issues, which the DFG’s appeal inadvertently indicated as well. Indirectly, the council alluded to the Cold War when demanding protection of cultural artifacts “in case of armed conflict.”^{44} The possibility of destruction made clear the division between socialist states posed and democratic cultures. However, awareness of GDR museum developments exemplified the issue of cultural difference more typically, and it was a subject that drew more than academics and museologists. According to the Secretary in the Ministry of Domestic Affairs Gerhart Baum in 1975, for example, the re-evaluation of West German

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^{43} For the *Spiegel* Affair, see Chapter 1.

^{44} Auer, ed., *Denkschrift Museen*, 188. See also Hermann Fischer, "Schutz der Museumobjekte im Hinblick auf Katastrophen und bewaffnete Konflikte," in Auer, *Das Museum*. Baum (1932-) of the FDP party was *Staatssekretär beim Bundesministerium des Innern* from 1972-78 and Minister of the Interior between 1978 and 1982.
museums was a civic responsibility given "the other half of Germany."\textsuperscript{45} West German identity was more than the expression of emphatic liberal democracy, in Baum's view; the FRG was a \textit{Kulturstaat}. However, he also noted that, with only 0.3 percent of the Gross National Product going to cultural affairs, West Germany was far behind its Eastern rival. West Germany definitely committed fewer finances than GDR, and was even comparatively negligent in larger ways, because federal organization for Western museums did not exist. Perhaps, Baum reflected, museums grew "organically" in the West, but while this independent and individual character was admirable, no one even knew how many museums existed in the FRG, let alone what they focused upon.\textsuperscript{46}

Besides the concern that the West might be "behind," technologically based anxieties of the period were integral to the reevaluation of museums overall. It is ironic that just as museums began to experience their greatest growth ever – in what is now familiarly known as the museum "boom" – some thought the museum was dying. However, this was a problem that the president of the International Council of Museums, Georges Henri Riviere, believed he faced.\textsuperscript{47} Though Riviere's rhetoric may have been just that, his sentiment also reflected a general sense of unease in a troubled economy. Emotional deflation resulting from economic inflation forced the question of whether the "good life" that seemed attainable in prior decades was truly possible or sustainable. To Wilhelm Schäfer of the Senckenberg Museum of Natural History in Frankfurt am Main, fears of an overpopulation crisis, along with nuclear missile anxieties, was responsible for

\textsuperscript{46} ibid., 24-25.
\textsuperscript{47} Auer, \textit{Das Museum}. 
a change in mentality of the current-day viewer.\textsuperscript{48} The feeling of precariousness also, it
seemed, contributed to an increased historical consciousness, or reflection about history,
which explained the steady increase in museum visits.\textsuperscript{49} The desire for historical
continuities and meaning was connected to the problem of livability, or what influential
museologist Hermann Auer – long-time president of ICOM-West Germany and formerly
of the Deutsches Museum – called the search for technology’s “human aspects.”\textsuperscript{50}

To some, the precarious situation presented a unique opportunity for the museum
to shape cultural politics. If people were going to survive, they needed to learn how to
live together. This was earlier said than done, but persons like State Secretary Baum
contended that it was possible. In his words, the “way to a human city” was already
underway with new developments in city planning, which sought to return “human
proportion and measure” to unsociable cities. Museums and their sponsors could also

\begin{quote}
feel called to make a contribution to a cultural politics that furthers
communication and works against isolation, offers amusement and free
spaces as a counterbalance to the pressures of life, and nonetheless
demands reflection [from its audience] so that attitudes of conformity and
superficiality might be held in check.\textsuperscript{51}
\end{quote}

“The particular and incontrovertible possibilities and great sociopolitical relevance of
museums,” proclaimed Baum, lay within carefully formed educational and cultural
politics that led to the advancement of a harmonious, yet critically conscious society.\textsuperscript{52}

\textsuperscript{48} Wilhelm Schäfer, "Museen in unserer Zeit," in Auer et al., Denkschrift Museen.
\textsuperscript{49} Kurt Böhner, "Die Museen und das Fortschreiten der technischen Zivilisation," in Auer, Das Museum.
\textsuperscript{50} Hermann Auer, "Humane Aspekte im Museum der Technik," in Auer, Das Museum.
\textsuperscript{50} Auer (1903-1997) was a professor of physics in 1943 at the University of Munich. Between 1948-1971,
his served as scientific director of the Deutsches Museum, but also focused on methodological and
pedagogical questions, and became president of ICOM-West Germany in 1969. Serving until 1992, Auer
was honored by ICOM with his nomination as one of the few honorary members at the international level,
Baghli, History of ICOM (1946-1996); Hans-Albert Treff, "Zur Erinnerung Univ.-Prof. Dr. Hermann
Auer," ICOM-Deutschland Mitteilungen 1997/1, http://www.icom-
deutschland.de/mittlelungen/icom971.htm (accessed 20 February 2006).
\textsuperscript{51} Baum, "Museen in der politischen Wirklichkeit," 30.
\textsuperscript{52} Ibid.
It was a given that the new cultural politics were to be distinctly democratic. As museums reformed themselves in the 1970s, many explored what it meant to be A Museum of Democratic Society, the title of a 1973 work by art historian Detlef Hoffmann. Museum discussions centered around becoming a “place of learning,” rather than remaining a hallowed “museum temple.”\(^{53}\) Democracy in the museum not only required attention to the presentation of subjects, but the subjects themselves as well. No longer would museum educators expect an acculturated visitor, keen on rarefied offerings. Instead, they sought instead topics that spoke to broad demographic interests. Democratically minded museum personnel stressed a pursuit of culture for the masses and a museum “for the people.” In Secretary Baum’s words, “a museum in today’s political reality means first and foremost that museums are understood and represented as part of our democratic, open society.”\(^{54}\) Gone were the times when “as one museum director opined, the worst enemy of the museum was the visitor.”\(^{55}\) Now, directors vied for yearly increases in numbers.

Yet the deeper, or political, lessons of a consciously democratic museum were still matters of debate. For some, recognizing that the museum could be a political tool meant applying the institution towards the ends of state in a Cold War world. What had to be realized by politicians and educators, according to one administrator of Berlin’s State Museums of Prussian Cultural Heritage, was that “the museum has become an important instrument of public educational politics” and that it must be “operationalized,”

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\(^{54}\) Baum, "Museen in der politischen Wirklichkeit," 19.

\(^{55}\) Ibid.
or included in the considerations of political planning committees.\footnote{Andreas Grote, "Museen als Bildungsstätten," in Klauswitz, Museumspädagogik.} He noted – perhaps as an attempt to goad his readers into action – that, as of 1975, the “Unified Socialist Educational System” had enjoyed museum and school cooperation for a decade, and also a pedagogical working group.\footnote{For more on the Arbeitsgruppe Schule und Museum, see Chapter 3.} In calling attention to the divide between East and West, the administrator made some of his intended political purposes for museums clear. For this kind of cultural politics, upholding democracy meant not so much an alteration in method for museum educators, as a redirection of their political aims.

For others, a democratic museum had to reconsider significantly its own operations, and foster social ties in what cultural historian Hermann Glaser called “the best democracy that Germany has ever had.”\footnote{Hermann Glaser, B. Deneke, K.G. Kaster, and J. Hübner, eds., Museum und demokratische Gesellschaft: Forüberlegungen zum Konzept eines historischen Museums für Nürnberg's Industriekultur (Nuremberg: Verlag Medien und Kultur, 1979). Glaser (1928) was Head of the Department of Education and Culture (Schul- und Kulturdezernent) in Nuremberg from 1964 to 1990, Hermann Glaser’s Homepage, http://www.hermannglaser.de/index.html (accessed 15 March 2006).} Rather than reaffirming structures of educational, and often economic, hierarchy, Glaser suggested that museums could help reduce tensions among the various sectors of society. First, museums had to acknowledge and represent the complex ties between the individual and society. Glaser observed that though progress against poverty was evident, the creation of a truly “living environment” demanded that “the yet unsolved problem of moral impoverishment and social isolation … be considered.” The problem was, basically, avarice: challenging the “new enthusiasm for a democratic system of values” was, in his opinion, an increasing “material covetousness” driven by commodity aesthetics. As an alternative, Glaser proposed the “democratization of aesthetics,” in which museums could play an important
role by recognizing the right of each citizen to a “cultural share [and] right of creativity” free from market or other forces. Even museum officials wanted both their participants to feel unconstrained or “free,” but learn something significant – educationally or politically – at the same time. Increasing the enjoyment factor in museum visits was one way out of the dilemma. A museum encounter was in fact “multifaceted, comprising of emotional, sensual and intellectual categories.” Taking advantage of the multi-sensory character of museums while ensuring that they also precipitated an “individual” and “freely voluntary” learning process seemed to indicate the incorporation of entertainment. However, entertainment created another problem in turn, for how could museum administration get people to enter its doors, of their own free will, without turning it into an amusement park? Restraining the entertainment aspect to “a means through which to support education and cultural enrichment” could prove challenging.

Complicating matters further, educational tasks did not always balance with other aspects of the museum’s mission that were also, arguably, matters of public interest. One of the most important public duties of museums was preservation, which was especially pressing given the rapid transformations of the postwar period. Perhaps the efforts to create 76 new protected natural areas or windmills were “trivial,” but Hermann Lübbe, a professor of Philosophy and Political Theory at the University of Zurich, argued that they were also “fundamental.” According to Lübbe, the “unprecedented musealization” of the

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59 Ibid.
61 Nitsch, *Schule wandert ins Museum*, 121.
1970s was actually due to museums fulfilling their function as "rescue station[s] for the cultural remains of destructive processes" whose effects were irreversible. Museum expansion was therefore not the result of a better standard of living, or even democratization, but rather served as a hedge against the acceleration of "scientific, technical, economic, social, and cultural changes." The acceleration, Lübbe noted, was evident in the very structure of the technological museum in particular, since technical museums opened new departments, each corresponding to a new focus in the multiplying fields of research, in shorter periods of time.

In light of society's obligations to the future, the dedication of resources to preservation was a difficult, but necessary, task. How this duty meshed with the museum's educational mission, especially when competing over departmental funds, raised an interesting question of priority. The debate over public mission was also an issue of discipline. In the words of museum theorist Heiner Treinen, "the museum reacts not first — as one might naively assume — to the needs and imaginings of its public." As museology matured in the 1970s, Treinen pointed out that museum personnel were beholden not only to the public, but to politics and the discipline as well, all of which had different and often contradictory claims. Therefore, the obligations of a museum dedicated to the public, and a democratic one at that, were far from clear. Regardless, "democracy" became the catchword for all these museum developments, which came into play as Berlin's technology museum formulated its relationship to the public.

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63 Ibid., 16.
64 As quoted in Nitsch, Schule wandert ins Museum, 123.
65 Ibid.
"A new kind of technology museum"

Orchestrated by a government ministry, the MVT was certainly unique in that its initial concept was debated on senate floors. The museum was a truly corporate venture rather than the project of individual citizens, delegated or otherwise. In 1978, Berlin Representative (SPD) Arnim Rheinländer became the Society to Rebuild’s new director, and plans for a technology museum finally advanced.66 Following the Senate’s call for an expert commission on the museum, Senator for Cultural Issues Dieter Sauberzweig authorized a study that brought together the most up-to-date conceptions on what a technology museum of the 1970s and 1980s should look like. Claus-Peter Gross, a famed exhibition designer, gathered a series of recommendations, which included the thoughts of Hermann Auer and Deutsches Museum director Theodor Stillger.67 The heads of the Transportation House of Switzerland in Lucerne, the Werner-von-Siemens Institute of History in Munich, the Senckenberg Museum of Natural History, and technology museums in Bremerhaven and Bochum contributed their opinions as well.68

Gross specifically asked the commission to make suggestions within a set of constraints set by the Senate. First, no one wanted a parallel to the Deutsches Museum. Not only was this impractical, for none could hope to match the Munich collection, but it

66 "Museumspark für Raritäten wie Loks, Oldtimer und die 'Tante Ju',' Berliner Lokal-Anzeiger, 18 December 1979.
68 The Mining Museum in Bochum, with origins in the 1930s, did not fall within the range of this study. However, it would have also been an interesting point of comparison. Given its focus on mining, the topics of labor culture, class, and history that Bochum dealt with made it an important example; the founding of the museum in Nuremberg discussed in the next section nonetheless represents these issues well.
had also been long established – before the Senate’s involvement – that a number of industries would not support any competition against the national treasure. In any case, the new museum was supposed to have an altogether different philosophy. The Berlin approach, which was worked out among the left-leaning SPD, the opposing CDU, and the classically liberal FDP factions within the Senate, would not limit itself to one technology and use the “most up-to-date museology.” This would involve, in the opinion of the recommenders, not only making “the significance and utility of technological development understandable to a broad public.” The museum would also have to, in the words of Auer’s recommendation, illuminate the “interdependency between inanimate cosmos and the intellect of man.” In other words, the museum would show how technology “is created by humans in order to expand their abilities,” but also “has an extensive influence in many ways upon the life of individuals and society.”

For technology museums, the most up-to-date museology had to contend with democratic museum theory in three ways: keeping pace with rapid technological developments, the heretofore inherent optimism of technical display, and the “fetishization” of technological displays. As professor Lübbe had already noticed, technology museums faced a special kind of problem in comparison to others. Given the rapid changes within science and technology, and the general tendency of technology museums to deal with the recent past, if not present, these museums were often in the

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69 Already in 1968 and 1972, the Automobile Industry Association and Deutsche Bundesbahn had made their views clear on this matter. The Verband flatly refused to support any Berlin venture, while the DB made clear in 1972 that their support was conditional in this regard, Museum für Verkehr und Technik Berlin, “Vorstands-Sitzung am 21.8.1968 (minutes),” 21 August 1968, MVT FV III/12; Museum für Verkehr und Technik Berlin, “Vorstands-Sitzung am 16.2.1972,” 16 February 1972, MVT FV III/12.
70 Gross, ed., Gutachten, Kroker section, 4-6. In his recommendations, Werner Kroker of the Mining Museum in Bochum cited the revised proposal (Weiterentwicklung den Antrag) of the SPD and FDP factions of 20 April 1977. Also from Senat Berlin, Denkschrift des Senats. As quoted in Gross, Gutachten.
71 Ibid., Auer section.
72 Ibid.
position of playing catch up. The second and third problems were not as obvious, but articulated well by Hermann Glaser during the founding of the Nuremberg Museum of Industrial Culture in the late 1970s. A focus on worker culture and the laborer’s perspective on the industrialization of society distinguished this museum from other technological museums and discussions around the Nuremberg example showed the potential problems that faced a consciously non-authoritarian museum.

According to Glaser, technical objects were often portrayed with the "unbroken optimism of the nineteenth-century liberal bourgeoisie and their expectation of continual growth."73 The problem with this perspective was not only that it seemed unfeasible in the 1970s, but that it also took the happy experience of a limited slice of society, and then imputed it to all. This was especially egregious, in Glaser’s opinion, since the experience of many workers appeared to be the exact opposite; displays that depicted technology as liberating, because it made work easier and faster all the while producing more, perpetuated a lie. Instead, when situated properly, an object would reveal clearly the “anti-emancipatory” character of technology. A more contextual display showed the fewer jobs and increased competition among workers produced by the search for profit.

In fact, an optimistic view of technology resulted from a myopic focus on the artifact, which was an “objectification” or “fetishization” that Glaser held the Deutsches Museum above all responsible. Based upon objects alone, technological history could easily tell a long, happy, and progressive story because only the successes of creative human power survived; objectified technology, in his view,

documents the process in which mankind makes the world progressively into its servant, and offers obvious views into scientific laws and

relations... [it] becomes an autonomous development in museums, not the result of human work, ... isolated from historical-social relations."\textsuperscript{74}

The other problem with divorcing the object from its original context was that it fed a consumer culture that Glaser found anti-democratic. In displaying the remarkable, and often aesthetically slick, technological object, Glaser maintained that museums like the Deutsches Museum not merely “objectified,” but indeed fetishized technology.\textsuperscript{75}

Fetishization encompassed all the ways that exhibits generated a fascination with an object through sheer aesthetic force, and rendered its social history or significance as unimportant.

In the “cultural historical museum” of Nuremberg, this kind of display was unacceptable. It was not that Glaser thought a neutral representation of technology to be possible; in his estimation, it was “uncontroversial that technology in its social aspect is neither value-free nor objective.”\textsuperscript{76} However, if “communicative, learning, and goal-oriented processes” were indeed the aims of technological education, then representations had to use “motivational aspect[s] of technology,” like aesthetics, but not pander to stereotypes of human desire and limit cognitive growth.\textsuperscript{77} These considerations were very much at the heart of visions for Berlin’s museum of technology. According to the Senator for Cultural Issues Sauberzweig, the museum would create a specifically democratic kind of culture, and balance the tensions of technology and democracy.\textsuperscript{78}

\textsuperscript{74} Ibid.
\textsuperscript{75} Ibid., 91-2.
\textsuperscript{76} Ibid., 91.
\textsuperscript{77} Ibid., 91-2.
\textsuperscript{78} Senator für Kulturelle Angelegenheiten, "Speech on culture and democracy," 14 December 1979, LAB IIIA Museum für Verkehr und Technik Bd. XLIX. In Sauberzweig’s words, “cultural politics in a living democracy” was not only attuned to the personal, and varying, needs of its citizens. Culture was also supposed to, in his view, “directly build consciousness in our technified, work-divided, and thus alienated world – it should sensitize the consciousness, give content to the lengthened leisure time, and awaken tolerance and a willingness to understand when confronted with difference.”
The director that Senator Sauberzweig chose to realize these ambitions was Günther Gottmann, the second in command of the Deutsches Museum.

Gottmann brought to his new job sensibilities that seemed in tune with those expressed by a good number of senators. While still the educational director of the Deutsches Museum, Gottmann had agreed with the opinions of Glaser: unbridled optimism and fetishization was no way to display technology. Yet he put it in different terms: one of the most important tasks for a technology museum was “to represent technology and science not as an astounding or frightening object of enthrallment (Faszinosum), but rather as a rational system through and through.”\(^79\) It was crucial, in Gottmann’s opinion, to make the “scientific rationality of the technical system transparent,” because only then would the end goal of technology – humanity – be clear.\(^80\) Not only was he was of the opinion that the Deutsches Museum accomplished these aims, in contrast to Glaser, but that it did so also on a cultural level; the Deutsches Museum, after all, represented democratic technological culture \textit{par excellence}.\(^81\)

When at the Deutsches Museum, Gottmann’s educational posture remained reserved when it came to the new trends in democratic museum theory. He believed, on the one hand, that museums should have the courage to call themselves ideological. Gottmann criticized exhibits that displayed technological developments “like an automatic evolution, whose growing stages in each instance are characterized as the happy confluence of laws of causation and great discoverers,” and then used “the untruthful label of a so-called value neutrality and objectivity.” It was in fact ridiculous

\(^79\) Günther Gottmann, “Museumspädagogik - zum Bildungsauftrag eines naturwissenschaftlich-technischen Museums,” in Klausewitz, \textit{Museumspädagogik}.

\(^80\) Ibid.

\(^81\) The relationship of the Deutsches Museum to culture is examined in Chapter 1.
not to acknowledge the ideology of progressive technology in the face of debates over necessary educational goals for a pluralistic society. On the other hand, he found the push for more democracy in the museum somewhat overblown. To talk to people "on their level" was not in Gottmann's opinion a democratization of the museum space, but something that any pedagogue already knew. Though he acknowledged the recent critiques of the museum, and also supported more "democracy" in it, his conclusions were not like those of his more radically minded colleagues. At least, this was the case while he continued to work within the Deutsches Museum.

With the move to Berlin, Gottmann could develop his ideas without the strictures of the Deutsches Museum's past traditions or current administration, and in many ways in direct contrast to them. Shortly after taking up the directorship in 1980, he outlined his new ideas about the relationship between a museum and the public. Gottmann now admitted that, with the exception of a few recent departments, the Deutsches Museum was still "manifest[ing] the spirit of the period in which it was founded, that spirit of a yet unbroken pride in the progress of human discoveries and the tremendous achievements of newly self-confident engineers." The MVT, conversely, would depict the multiplicity of connections that technology involved, in addition to bridging the distance between the scientific layperson and specialist. Or, as Gottmann put it, they "[could] not exhibit the shiny chrome antique auto of the Golden 1920s or romantic steam locomotives without,

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82 Gottmann, "Museumspädagogik - zum Bildungsauftrag," 67-68.
at the same time, showing the latter-day problems of individual and public transportation, city planning, and energy politics.”

With the Berlin opportunity, Gottmann reclaimed some of the activist spirit that had defined his time in Brazil, and he and his compatriots codified the “new kind of technology museum" they hoped to offer in the name of the museum itself. This new vision hinged on the dynamism of Verkehr, a word that covers both transportation and communication, but implies the flow of personal relations. Thus, the Museum for Transportation (Verkehr) and Technology would represent the human interconnectedness of technology. The name showed, in Gottmann’s words, “that transportation, and thus communication, is the fundamental principle of each technology (as well as all of life) – the traffic (Verkehr) of people, goods, energy, information in each organism and each technical system.” The first departments of the museum were to be, accordingly, transportation, energy, communication, labor, “living spaces,” and the natural sciences.

Though the museum would recognize the political dimension of technologies, it would neither dictate the type of technologies that should be developed nor the manner of their implementation. “What kind of significance,” Gottmann asked, “should a museum bestow [upon an object…] given the fact that every thing (Ding) on the planet is already ambiguous or has multiple meanings?” Using the steam engine as an example, Gottmann rattled off a list of varied interpretations and meanings to make his point. One could regard the engine’s significance upon other technological apparatuses, the minute

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84 Ibid. Another place where Gottmann talked about the everyday aspirations of the MVT can be found in Gottmann, "Was wir haben."
85 Chapter 1 recounts Gottmann’s time in Brazil before his job at the Deutsches Museum.
88 Gottmann, "Was wir haben."
technical details – like pressure statistics – of its construction, the catalyzing role it played in the Industrial Revolution, the way it facilitated mass migrations from country to cities (and their miserable housing conditions), or even “how it made factories, Karl Marx, the Communist Manifesto, standardized mass production, a higher living standard, and technological progress all possible.” A prioritization of these many meanings was presumptuous, in Gottmann’s eyes, because with “all of these new meanings and considerations, only the smart aleck ‘knows’ how to decide which is the most important.”

Instead, the museum would serve as a forum for discussion between citizens. In his initial conceptual sketch of the museum, Gottmann stated that issues were to be “discussed and documented… in other words, [visitors were] not to be lectured to or indoctrinated.” If, as Gottmann noted, the experts themselves could not come to a unified stance regarding technologies, then a museum should not assume a partisan or conclusive position either. He echoed, unknowingly or not, the thoughts of Brazilian pedagogue Paulo Freire in his powerful 1970 work, Pedagogy of the Oppressed. Deciding the merits of technology was actually the purview of a democratic citizenry, which was not only their right in Gottmann’s view because public monies sustained the museum. Ultimately, in a liberal democracy, it was citizens who would make decisions on technologies upon which even the most competent scientific experts could not agree.

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89 Ibid.
90 Ibid.
92 Formulating a program for education that was both revolutionary and non-oppressive, Freire declared “Just as the educator may not elaborate a program to present to the people, neither may the investigator elaborate ‘itineraries’ for researching the thematic universe, starting from points which he has predetermined,” Paulo Freire, Pedagogy of the Oppressed, trans. Myra Bergman Ramos, 30th anniversary ed. (New York: Continuum, 2002), 108.
The politics of the "Green Center"

Despite the fact that Gottmann and his staff had codified visions for the museum by 1980, the MVT still took another three years to open. First and foremost, the Senate faced the problem of where to locate the structure; in the embattled zones of West Berlin, land was a vexed issue that often required negotiation among several authorities. The problems for the proposed technology museum were significant, and not only because of limited space. Although Berlin’s British sector contained the former Transportation and Architecture Museum – and its artifacts – East Germany also had jurisdiction in this matter. The structure happened to be a former railway station, and the GDR had inherited the former Soviet rights over all rail property. Even a visit therefore required the permission of both authorities, with the East Germans granting access and the British providing protection. In order to lay claim to the holdings of the former museum, the focus of new one underscored its lineage to former Berlin exhibitions. This was another reason why the inclusion of “Transportation” in the museum’s name was important.

Land was also a tense issue for politics at the local level. Though bribes or murky deals involving Berlin senators had never been unfamiliar to city politics, a multimillion mark real estate scandal in 1981 rocked the government to the core. SPD Mayor Dietrich Stobbe had made a 115 million mark loan to the real estate developer Dieter Garsky for housing projects that turned out to be fraudulent. The deception was egregious not only because of its scale, but also because it touched the sensitive subject of Berlin housing.

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96 Large, Berlin, 466.
Although the postwar housing crisis had ostensibly long been over, there were still many dilapidated buildings in Berlin whose owners — land speculators — had little incentive to improve, but were no longer legally fit for habitation. Using the condemned housing as tax write-offs, landlords had also impoverished the living environment of neighborhoods like working-class and immigrant Kreuzberg.\textsuperscript{97} The scandal resulted in a major upset, with the politically and socially conservative CDU party taking leadership over the traditionally “red” city. Also sending “shockwaves” through city politics was the arrival of a new party, the Alternative List (Die Alternative Liste, AL). Not only was the “Alternative” allied with the Greens, but it also stood in solidarity with the illegal inhabitants of the condemned buildings and even advocated the departure of Western allies from Berlin. Capturing more than the requisite 5 percent in Berlin, the AL joined the Berlin Assembly and also won representation on the federal (Bundestag) and European parliamentary levels.\textsuperscript{98}

The city’s financial situation endangered the realization of the technology museum.\textsuperscript{99} The plan to open the museum in 1981 ran aground. Gottmann agitated for support by trying to emphasize Berlin’s technological character, declaring “the history of Berlin is more stamped with natural sciences, technology, and industry than the histories of all other European metropoles.”\textsuperscript{100} For all the importance of the technological and political issues raging in West Germany, Berlin’s technology museum still apparently

\textsuperscript{97} Bark and Gress, \textit{A History of West Germany}, vol. 1, 296; Large, \textit{Berlin}, 493.

\textsuperscript{98} Large, \textit{Berlin}, 495.


\textsuperscript{100} Museum für Verkehr und Technik Berlin, ed., \textit{Oldtimer und Flugmaschinen}, 1.
played second fiddle to the rest of the city's museums. Nonetheless, the Museum für Verkehr und Technik managed to open in 1983, though it proceeded in fits and starts.\textsuperscript{101} Questions remained about continued financial support and other details as well. Regarding ownership of the objects, for example, it was uncertain as to whether they would become the property of the state, the museum, or the Society.\textsuperscript{102}

When the MVT first opened, however, Gottmann figured out a way to transform the uncertainties into advantages. In negotiations with the GDR and the city, the museum had finally acquired an area associated with the former, famed central Anhalter Station of Berlin.\textsuperscript{103} The location was a tremendous gain. As a historical site of freight and goods exchange in Berlin, it perfectly aligned with the museum's main theme of transportation and would lend an aura of authenticity. Furthermore, the central position was ideal because the institution hoped to address the city at large. However, large parts of the site were in ruins, and the hiccups in funding meant that progress was slow. In the end, the museum opened in an unfinished state, but the very act of opening was quite a feat given the long years of many efforts to find it. Indeed, Gottmann held that the fragmented construction process of the museum had great significance. Perhaps he made a virtue out of necessity, but in his view, the museum's incompleteness manifested the entirely new relationship to the viewer that the staff hoped to achieve.\textsuperscript{104}

Key to this new relationship was making sure that both the museum and technology respected the human "connection to nature." Science and technology were

\textsuperscript{101}Jörg Schmalfuß, conversation with author, 30 April 2004.
\textsuperscript{103}The museum obtained the area that had encompassed the Anhalter station for freight and goods – not persons (located just south of the famous Anhalter station).
\textsuperscript{104}Museum für Verkehr und Technik Berlin, ed., 
\textit{Schätze und Perspektiven}. 
not the “overcoming of nature, but rather its blooming (Entfaltung),” or mature realization, Gottmann averred. As architects and designers of the museum tackled its construction, they faced two challenges. Not only did they have to determine what a relationship with nature portended for individual installations, but designers had also inherited a space that itself possessed great significance in regard to their goals. This was not so much due to the land’s former, East German ownership as its particular, “green” character. Because the site was a former freight train station, it was already fairly undeveloped and sparseness had doubly been insured by the bombing campaigns of the war. In the years since, “native” flora and fauna had returned to the area. Thus, the earliest discussions and designs of the museum revolved around preserving the integrity of the open, green space in the very center of Berlin that the museum had received.

Ongoing construction of the museum allowed for public input, though the museum could not have acted independently in the matter even if tried. This new “city center” was an object of discussion in the Senate, and local editorials chimed in as well. One Tagesspiegel writer opined at the outset that the land should become a “protected natural area” instead. Environmental sensibilities of the period took on a new dimension in a city where land was scarce and movement restricted, excepting the narrow autobahn corridor to West Germany. Since every inch of city space impacted the West Berliner’s quality of life, the possibility for more recreational room was highly prized.

105 Ibid.
106 The fact of the museum’s central positioning depended upon the view; in today’s unified Berlin, it is certainly central (just a touch on the southern side). During the divide, it was not geographically at dead center, but was just south of the city’s historic center (Mitte), and it bridged the western, and more affluent, neighborhoods of Charlottenburg and Schöneberg with the eastern Kreuzberg.
107 “Ein Stück Bahnhofsgelände soll zum Naturschutzgebiet werden: Seltene Wildpflanzen und Kräuter wuchsen in der Innenstadt,” Tagesspiegel, 8 March 1980. These issues continued to be debated when the museum was already underway, by the AL party, for example, “Große Anfrage der Fraktion der AL über den 'Zentralen Bereich',” Abgeordnetenhaus von Berlin Plenarprotokoll 13. Sitzung, no. 10. Wahlperiode (1985).
Noting that the museum site was one in which “seldom-seen wild plants and herbs grow in the middle of a city,” the Tagesspiegel editorial urged its preservation. It could serve, in the newspaper’s view, as a kind of barometer for environmental conditions, climatic developments, and even pollutants. If, for example, “certain types of plants died out, then it is a sign that our strain [upon the environment] has become too great.”

In response to the ecological and urban livability concerns, the Society of Architect and Engineers of Berlin (Architekten- und Ingenieur-Vereins zu Berlin) awarded its prestigious Schinkel Prize to outstanding projects of young colleagues in 1982 that focused on the theme of free space. One of the society’s leaders, architect Manfred E. Gehrmann, expressed the matter with urgency: the conditions of West-Berlin’s exceedingly tight inner-city, which was “suffering under the considerable Freiflächendefizit (free space deficit),” demanded responsive and responsible development. Thus, Gehrmann considered it “undemocratic” that the city did not realize the projects of all Schinkel awardees. Happily, this was not the case for the MVT, whose design numbered among the Schinkel Prizes that year. Heeding the concerns of the public, the museum designers strove to preserve as much of the landscape as possible.

The design and its goal of preservation also aligned with the museum’s larger concept. Titled “The Green Center” (Grüne Mitte), the designers used the museum space

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108 “Ein Stück Bahnhofsflächenstandort, Tagesspiegel (8 March 1980).”
110 “Sonderdruck zum Schinkelfest 1982,” AIV (Architekten- und Ingenieur-Vereins zu Berlin)-Forum (1982). Gehrmann was one of the architects of the University of Bielefeld, 60er Architektur der 50er, 70er, (http://www.nrw-architekturdatenbank.uni-dortmund.de/arch_detail.php? gid=1096: Uni-Dortmund, s.v. "Manfred Gehrmann.”
111 "Sonderdruck zum Schinkelfest 1982."
to connect the “isolated” neighborhood of Kreuzberg with the rest of the West Berlin.  
Moreover, the museum would incorporate a recreational area that created equilibrium between ecological space and other cultural establishments in the area. Among the cultural institutions was the MVT itself, which would include restored historical buildings on the site. The signature of the design, however, lay in leaving – as much as possible – dilapidated old structures of the former train station among the trees and greenery, or “Nature,” that had re-encroached since the war. In the words of designers Axel Oestreich, Eva-Maria Eilhardt, and Werner Weinkamm, the “charm of the space lies within the juxtaposition of mouldering, technological structures against a Nature left to itself.” The point was to show the “historical,” or consciously man-made, “process of the tearing down (Aufreißen) of Nature.” In practical terms, this meant that the “museum of a different stripe” would include “meter-high trees among the decaying remains of bombed-out train sheds – all with the approval of the museum’s administration.”

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114 “Schinkel-Wettbewerb 1981/82.”
115 Ibid.
The historical process was not ultimately one of destruction and decay, but of regrowth, to use the biological terms of the museum designers. The park would show a confrontation between human and natural history: first, the subjugation of the site to the railroad, then its decimation by aircraft and bombs, but finally, the overtaking by wild grasses and weeds. An argument for the tenacity of ecology was thus possible.\textsuperscript{117}

According to this logic, constructing a hall of airplanes, among other things, alongside the nature park did not demonstrate the superiority of technology, but rather its ambivalence with regards to progress.118 Other aspects of the design were more hopeful about a possible mediation between nature and technology. For instance, designers planned to dot the natural area with past and futuristic examples of “intelligent” energy technology, such as windmills and solar power devices.119 Moreover, designers intended that one of the museum buildings itself would incorporate the latest energy conservation techniques and exemplify the height of technological sophistication.120

Gottmann hoped that the museum – its buildings and the park – would set forth a different cultural politics, or message, compared to technology museums of the past. It would also make a contribution to an “alternative” culture to Berlin, though not like the raucousness of the political Alternatives. Gottmann and the museum designers also positioned themselves against highbrow cultural types as well as the need for distinguishing between a West versus East culture. The “actual alternative culture in Berlin,” according to Gottmann, was the “forgotten culture of the natural sciences and technology.”121 The environmental design was intended, then, to offer a third way by showing technology’s place within not matters of high class or geopolitics, but daily

118 One of the highlights of the prize-winning MVT plan was the display of airplane technology.
119 Plans for alternative energy objects and exhibits on recycling began at least by 1981, VMB, Informationen 1981, no. I.
120 Plans for the building and its actual construction took the span of Gottmann’s career at the MVT. One particular wing involved a never-before attempted glass building, in which the latest technology in materials would take advantage of the sun for both heating and cooling. On 23 March 1991, the plans were finalized as a cooperative project of 140 million marks supplied partly by city and Ministry for Research and under the auspices of the Technical University of Berlin and IBUS (Institute for Construction, Environmental, and Solar Research). However, as the financial situation went into crisis with the unification of Berlin and Germany, the building was halted and almost called off entirely. It was finally completed in 2001, “Neues Museums wird von der Sonne geheizt,” Berliner Morgenpost, 5 October 1989; “Energie-Experiment von Bund und Land unterstützt: Museum fTV in Kreuzberg präsentierte Neubau für 140 Millionen Mark,” Der Morgen, 23 March 1991; Schmalfuß.
121 “Sonderdruck zum Schinkelfest 1982.”
realms of culture and politics. Stating his resolve to pursue confrontational education and the creation of his museum in the face of Berlin’s polarized politics and the MVT’s continually precarious financial position, the former theologian Gottmann used an appropriately natural metaphor of Christian history: “It reminds me of that famous illustration, that is alternately ascribed to Francis of Assisi and Martin Luther: ‘What would you do, if the world ended tomorrow? – I would still plant an apple tree today.’ Now, the tree is planted…”

By the time Germany’s Cold War finally ended, the museum in fact realized a good many plans, although not as many as Gottmann and others had originally envisioned. The museum finally established 12,000 square meters of exhibition space by 1991, though this too fell short of initial plans. It remained the slowest of building projects, subject to perpetual battles over funding that only increased after reunification. Even in 2004, the museum was incomplete due to the additional red tape regarding land rights amid the tortuous merger of legal systems after unification. However, as Gottmann maintained, incompleteness and the struggles to realize the museum showed the politics of technological display. The alternative culture that Gottmann and the museum proposed was also evident in the exhibitions.

Locomotives and aesthetical ethics

The most elaborate exhibition of the MVT during the 1980s dealt with the railways, which was perhaps predictable given the museum’s focus on transportation and the site’s history. The installation included the very structures that housed the artifacts on display: train engine sheds original to the location held a majority of the exhibit. The

122 Ibid.: 25.
first shed had opened in conjunction with Berlin’s 750th birthday in 1987, and renovation to the second and final shed finally completed during the next year, just in time for the 150th anniversary of the first Prussian railway (between Berlin and Potsdam). Elaborate displays and impressive locomotives helped make the museum’s most popular attraction. In fact, in the opinion of a researcher who conducted a study of the MVT, it was a “railway museum” for most; visitors skipped over many other installations to go straight to the holdings in the outside park.

While the railroad exhibition was the most popular part of the museum, MVT personnel also most directly challenged the progressive story of technology there. Alfred Gottwaldt, railway historian and senior curator of the locomotive technologies department, sought to create a “critical confrontation” with the viewer that relied heavily upon “de-fetishization.” or an attentive, historical evaluation of the objects. It was for this reason, for example, that the museum allowed its locomotives to remain covered with (some) rust and grime, thereby calling attention to the fictitiousness of restoration inherent to all technology museums. However, this policy did not necessitate unattractive displays. In Gottwaldt’s words, the public’s known “desire for optical pleasure” would be the “lever... to precipitate a critical [engagement] with the material

126 Ibid., 119. This was the case when even more exhibits competed for the visitor’s attention in comparison to the 1980s.
and with the foundational problems of technology." The challenge was to strike a balance between motivating viewers and taking into account their desires without turning the museum experience itself into a commodity.

The task was especially critical given one of the lessons of Nazi history: attractive aesthetics were certainly ambiguous and could even be dangerous. Hitler, failed artist though he was, had known how to utilize monumental pomp and colorful circumstance for his purposes. Thus, the railroad exhibit sought to employ an aesthetics informed by history. The overarching structure of the show consisted of "stations" in time through which the visitor would encounter a history of the railroad particular to German and Berlin contexts. At each stop, installations used the nostalgia for times past to create an easily accessible and everyday technological history. Most technology museums were already well acquainted with themes that touched everyday life, but the MVT also reminded viewers of the specific context of recent German history, including the Nazi period. Gottwaldt had included the uneasy aspect of the exhibition in conceptualizations long before the museum opened its doors. From the early 1980s, he had planned that a "1943" stop would represent the use of trains as genocidal instruments in the deportations of Jews, political prisoners, and others to concentration camps.

Since to the best of the staff's knowledge, the explicit connection between technology and mass murder had never before been displayed in a technology museum,

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129 Gottwaldt, "Rohkonzept."
131 Gottwaldt, "Rohkonzept."
132 Ibid.
let alone highlighted, they considered it a breakthrough. As director Gottmann wished, the meaning of the locomotive would be ambiguous, shown both as

a vehicle of never-before experienced mobility and experience of the wide world, as a lifeline of industrial progress, as an object of speculation and prestige, but also as an instrument of colonialism, of war, of the mass deaths in Auschwitz.

Through ambiguity, the museum hoped to avoid what Gottmann considered the two extremes of fetishization and moralization. On the one hand, with the inclusion of the cattle car of 1943, the exhibition clearly prevented the viewer from a “wordless, admiring fetishizing of the object.” Yet by taking visitor interest into consideration, and making it an important parameter of exhibition construction, the museum also aimed to avoid overburdening the visitor’s experience with moralizing. They would not, he declared, “obfuscate the artifact with ideological hot air or a pedantic know-it-all attitude.”

The swastika markings on older locomotives perfectly exemplified the challenge that the museum faced in representing politically charged technology. With conviction, the museum had left the swastikas rather than camouflaging them. This was critically important for the museum, in curator Gottwaldt’s opinion, to achieving more than an “antiquated Vergangenheitsbewältigung (overcoming of the past).” An antiquated pedagogy would “displace” the issue by either “relegating the aluminum hollow-casting locomotives of 1940 to the heap or ashamedly pulling a sheet over the swastika.” This was in fact detrimental, because it was not good to separate the pretty, streamlined forms of that period from the aesthetic seductive power of the system... [yet] it must always remain

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133 Gottwaldt, Züge, Loks und Leute, 13.
134 Ibid., 7
135 Ibid.
recognizable that this sign of the state and party is still, for many people of every age, a sign of terror.\textsuperscript{136}

Thus, Gottwaldt displayed these difficult objects in a way that hopefully made "an uncritical consumption" less feasible. It was nonetheless risky, but what he sought in terms of payoff was tremendous. Instead of parroting an accepted set of conclusions, his exhibition might catalyze authentic conversations among his visitors – during a weekend visit shared by grandfather and grandchild, for instance – regarding the past.

Railway transportation explored other contentious topics of German history as well. For example, the display of manufactures by the local petrochemical and locomotive giant Borsig offered an opportunity to grapple with the problem of appropriate living standards for workers throughout the nineteenth and twentieth centuries. Moreover, the museum also placed Borsig technology as part of the "militarization of the locomotive," or the utilization of railways for war purposes.\textsuperscript{137} The railroad department also tackled current-day political tensions. When Gottwaldt strove to acquire a second-class wagon car from the GDR, he said it would serve as a "symbol of the two [divided] German railway administrations" – and nations – after 1945.\textsuperscript{138}

To Gottwaldt, the opportunities for critique were possible because the museum was a publicly financed institution. Not only did the museum belong to the city of West Berlin, but funds for the railroad exhibit’s completion even came from the proceeds of a local lottery – not corporations.\textsuperscript{139} Public economic support had made detachment from the "usual orientation towards state rail industries of many large locomotive museums"

\textsuperscript{136} Ibid.
\textsuperscript{137} Ibid.
\textsuperscript{138} Gottwaldt, "Rohkonzept."
\textsuperscript{139} Gottwaldt, \textit{Züge, Loks und Leute}. 
Chapter 4

Gottwaldt felt the museum's freedom was especially clear when it came to displaying GDR railway history, a subject that he thought many museums would not even approach. "There remain walls not only between borders," Gottwaldt noted, "but also in minds and even in museums when it comes to the collection and exhibition of typical railway objects from the GDR (which goes vice-versa [for East Germany] even more so)." 141

Though it is difficult to conclude whether or not Gottwaldt and Gottmann's strategies to facilitate critical independence in the viewer succeeded overall, some visitor responses exist. When the exhibition was between six and seven years old, a survey of viewers showed that reactions varied. One person was satisfied with the museum and felt that there were clear evaluations the quality of life during the nineteenth century, which included conditions for laborers, and about the Nazi period. 142 However, others were not as certain. While one viewer came to the puzzling conclusion that "no critical statements" existed in the museum, others complained exactly about the points that Gottwaldt tried to make. "War, always and again, the war!," exclaimed one disapproving visitor. 143 Another expressed his dismay at the condition of the engines and wagons, which were "muddy and [with] a lot of rust." 144 In contrast, several visitors expressed concern about the display of Nazi symbols and "relics" because they did not see clear explanations of their meaning, and felt that "children...could be influenced" – negatively, that is. 145

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140 Ibid., 12.
141 Ibid.
142 Gefallen 0360 in Vorwerk, Besucherbefragung.
143 Kritik 0826 in Ibid.
144 Kritik 0252 in Ibid.
145 Kritik 0973 in Ibid.
On the one hand, whether or not all the visitors “got it,” the fact remained that the locomotive exhibition was one of the museum’s most ambitious and critical. The vagaries of attention spans, each viewer’s own expectations, and his or her visual sophistication were factors over which the museum had no control. Indeed, by bringing their own prerogatives to an exhibit, visitors behaved as much as one could have hoped in a museum that sought to avoid pedagogical controls. On the other hand, however, the feeling of directionlessness, which was another complaint of the critic who blasted the museum for dwelling upon the war, portended more than his particular desire for structure. Faced with the ambiguity of “good” and “bad” technology, visitors did not then respond as citizens empowered with a sense of control over technology, but at least in one case: aimlessness. Moreover, though the museum insisted on displaying grime-encrusted locomotives and sometimes contextualized their objects with tragic histories, these examples did not negate the larger problem of an attractive aesthetics used to engage viewers.

The attention to aesthetics simultaneously, for instance, inscribed the museum into the cultural circles of Berlin. An exhibition in 1988, “Mythic Berlin,” looked at the locomotive as art and the event revealed a certain politics of technology and aesthetics that was not very ambiguous. The attempt to reconfigure an actual locomotive into a piece of art that would symbolize “the demise of the railroad in Berlin” was, first, literally political in that it stirred controversy. It flopped tremendously – only 90,000 out of an expected 200,000 visitors came – with the League of Tax Payers protesting against the Ministry for Cultural Issues, which desired to purchase the piece. Secondly,

portraying the aesthetics of locomotives, or technology for that matter, was that staid
approach of the Deutsches Museum that created cultural capital for itself.  
In this
regard, it seems that Gottmann may have brought some of his former sensibilities with
him.

Whether debated outright or not, the meaning of the technological aesthetic was
not always clear. The complaint that there was no overview, or direction to the overall
space, meant that viewers were theoretically left to make their own conclusions. Yet
aesthetic considerations permeated the entire museum in ways that were not merely
obscure or contradictory. It was in technologies of commodity production that the
museum’s ambiguous aesthetics may have undermined the museum’s mission more than
Gottmann intended.

*Freedom in the grand marketplace*

As mentioned earlier, Gottmann’s model for the viewer was that he or she should
have the ultimate freedom to choose in the MVT. His goal was to “mediate the cultural-
historical dimension of technology without indoctrination,” which meant that it would be
up to visitors to decide what they wanted to see and even what to conclude about the
technologies as well.  

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147 For example, Ferry Ahrle, who used themes of transportation in his painting, was an artist displayed
more than once in the DM. In an opening speech on his exhibition “Art and the Railways” in 1972,
Minister for Transportation Georg Leber opened, saying “The toy trains of childhood awaken interest in
technology and a longing for distances. Later in life, the railways become a lifeline of connections. Each
person that rides them does so to encounter others. For this reason, I am overjoyed that an artist felt moved
to capture in images the manifold of human relationships to technology,” Georg Leber, "On Ahrle
[Stillinger?], "Speech ‘Licht in der Malerei,” 31 May 1976, DM VA 0910, 2 with Museum für Verkehr und
to maintain that the museum was not merely representing technology and its reach but also “empathically
its cultural significance.”

148 “Am wichtigsten ist der pädagogische Eros: Günther Gottmann, Gründer des Technikmuseums, Ex-
principle. Greeting the viewer was an installation called "Wheels and Rotation," in which a veritable hodge-podge of technologies surrounded the viewer. Ox-driven carts, for example, stood next to regal coaches, and airplane technology hovered above in the attempt to depict technologies of mobility. No large signage existed to direct the viewer and placards were not immediately visible. At first glance, the visitor seemed to have complete freedom.

"Freedom" and its related derivatives, like "liberty," were something of catchphrases in the MVT from the beginning, and the value or potential of the technology in question became unambiguously positive when installation designers invoked them. The bicycle and motorbike, for example, were more than mere vehicles of movement; they were instruments of emancipation.\(^{149}\) One of the first exhibitions in the MVT focused on old posters of nineteenth-century women (complete with bloomers) on bikes, through which the museum tied technology to the women’s liberation movement. A reporter, at least, made the connection. In the depiction of a woman rider pedaling before

\(^{149}\) Schivelbusch, *The Railway Journey.*
a steam locomotive, he saw "the bicycle as the 'preparer of the way' towards emancipation." Motorbikes were vehicles that not only created the feeling of freedom, but also, as an exhibit showed in 1990, equalization among the classes. Through the motorcycle, the "'little guy' seized his piece of mobility and individual freedom." Without a doubt, museum educators were also aware that many of these technologies were products available for purchase, which complicated the prospects of freedom. The installations displayed these considerations as well. For instance, designers of the household technologies exhibit in 1985 questioned the quality of women's emancipation in connection with technology. Though labor-saving household devices had been touted as "freeing" women, the museum's first exhibition on the subject asked directly – on a placard – whether this was in fact the case. Moreover, the installation pointed clearly to the economic interests of corporations, since these technologies were "a very essential market for different industrial branches, in particular the electrical industry." The exhibit intended to show "how women became 'discovered' as a particular consumer target-audience and that creating the 'economical and smart housewife,' who still stands at the center of advertisements, was the goal of technologizing the household (Haushaltstechnisierung)."

Though state ownership over the museum and its holdings gave MVT educators some critical distance, the prevalence of products in the museum, combined with the sheer pleasure that many viewers took in gazing at them, was inherent to the

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151 "Zweiräderiges Vehikel für den 'Kleinen Mann'," Welt am Sonntag, 4 April 1990.
153 Ibid.
154 Ibid.
enterprise.\textsuperscript{155} Challenging that delight could be formidable, as ICOM representative Hermann Auer observed. “Car,” for example, was the third word “after ‘mama’ and ‘papa’ – that the average baby of our civilization learn[ed] and [spoke],” wrote Auer, and the auto remained “a status symbol and object of desire for the have-nots.”\textsuperscript{156} The cultural importance of the automobile seemed to explain not only why every technology museum possessed a nostalgic row of “Oldtimer” cars, but also the fact that 98 percent of visitors ignored the accompanying placards. Apparently, they only had eyes for “shiny chrome.”\textsuperscript{157} Car enthusiasts also likely included those that, in the interest of “freedom,” protested automobile speed limits despite the oil problems during 1970s.\textsuperscript{158} Given the fact that the visitor was free to do as he liked – and the viewer was in fact usually male (and 38 years old, to boot) – in a museum that strived to reach the everyday “little guy,” an altogether critical position of commodity politics was impossible.\textsuperscript{159}

At times, the MVT tried to confront viewers with the problem of uncritical consumption. When the museum still used the halls of Urania, for example, it considered the aesthetic and economic dimensions of automobiles in art. Sponsored by ADAC, the German equivalent to the Automobile Association of America, the 1980 exhibit was “kindly self-critical” in the view of one reporter.\textsuperscript{160} Artistic works from the likes of surrealist Friedensreich Hundertwasser and Fluxus/performance artist Joseph Beuys

\textsuperscript{155} Undoubtedly, corporate interests were significantly involved in the early formation of the museum society. However, by the 1970s, members became increasingly sensitive to conflicts of interest and tried to assume a disinterested posture for the institution. Starting in 1974, discussions took place to ensure that the objects would belong to the museum and Berlin, asserting that “the purpose of the Society is not directed to an economically-oriented business purpose,” VMB, "Entwurf," 1974[?]. The Senate’s later involvement solidified the city and institution’s legal ownership over the holdings.

\textsuperscript{156} Auer, "Humane Aspekte im Museum der Technik."

\textsuperscript{157} Ibid., 83.

\textsuperscript{158} König, Geschichte der Konsumgesellschaft, 306.

\textsuperscript{159} Vorwerk, Besucherbefragung, 29.

presented glamorous images associated with driving as subject matter. The aesthetic
included sexy red lipstick, and yet, the exhibit “pitelessly spliced the fetishizing of
automobiles from the culture surrounding transportation, like a corpse on the examination
table,” in the words of one reporter.\footnote{161} Notably, representatives of the auto industry were
not present.\footnote{162}

However, towards the end of the 1980s, the critique was much less pointed or
even present. Using local or national pride as justification, museum administrators
permitted the presence of commodity brands in a way that eroded critical distance. In
1990, for instance, an exhibition on motorcycles focused on famous brand-name
elements from Berlin, while another entailed a forty-year retrospective of Audi
automobiles.\footnote{163} The latter undoubtedly provided interesting social and political history,
because it mapped the fate of an industry divided in the Cold War and was thus relevant
to the revolutionary times. Nevertheless, the displays also highlighted vehicles
manufactured by the Audi corporation, which sponsored the entire presentation. The
ever-increasing financial problems of the Berlin, which became more critical as a result
of unification, seemed to create a growing dependence on outside funds that tried the
museum’s heretofore freedom of presentation.

Funding problems explain the MVT’s most problematic display of technology: a
museum guide published just after unification in 1991. Advertisements appeared on the
front and back flaps of the edition, and throughout as well. In addition to Audi products,
the guide contained the services and products of automakers Daimler-Benz and Opel, the

\footnote{161}{Ibid.}
\footnote{162}{Ibid.}
\footnote{163}{Maria Borgmann, "40 Jahre Autos aus Ingolstadt' im Berliner Technikmuseum," Press Release, 1
February 1990, MVT Ordner Medien-Infos; Maria Borgmann, "Motorräder aus Berlin (23.06.1990-
Sommer 1991)," Press Release, 7 June 1990, MVT Ordner Medien-Infos.}
electrical and household appliances giant AEG, and even banks like Berliner Sparkasse.\textsuperscript{164} BMW must have splurged, given its five-page spread in the center of the book. In each ad, slogans strove to connect the company to key aspects of the museum’s character. Siemens called itself “future-oriented,” while BMW boasted “made in Germany” world-class quality, recognized in “over a hundred nations,” and claimed the “World Records of Yesterday, Highest Achievements of Today, Technology of Tomorrow.”\textsuperscript{165} The Deutsche Bank advertisement tried to avail itself as much as possible of the museum’s cultural – rather than technological – caché, however. Using buzzwords of culture, history, and even world peace, the page declared,

The new [view] of things is culture …. Culture is like the economy, a strong binding agent among peoples.

Berlin’s historical contribution to the culture of Europe as well as the cultural strength of our city today are the best preconditions for renewing the net of cultural relationships in Europe.

Preparing the way to peace and mutual understanding is a task in which culture and economics can significantly inform the solutions.\textsuperscript{166}

In other words, readers of the guide could learn not only about the museum and technology, but also that Deutsche Bank was poised to take advantage of the new opportunities that German unification provided.

The new developments presented opportunities to corporate interests that were not, however, necessarily shared by the museum or its potential visitors. As the museum guide made clear, funding for the museum had reached new lows, which threatened its future. Indeed, Gottmann had to protest suggestions for privatization.\textsuperscript{167} At the same time, the merger of East and West economies began to translate into large-scale corporate

\textsuperscript{164} Museum für Verkehr und Technik Berlin, ed., Museumführer.
\textsuperscript{165} Ibid., 63.
\textsuperscript{166} Ibid., back flap.
\textsuperscript{167} Potsdamer Neueste Nachrichten, 25 January 1995.
buyouts, downsizing, and unemployment, leaving many in the former East to feel that Western businesses and citizens profited at their expense.\textsuperscript{168} This created a growing sense of division – now on the levels of culture and even consciousness – between “Wessis” and “Ossis,” or former West and East Germans, in spite of the political fusion.\textsuperscript{169} During the fall of the Berlin Wall, East Germans may have altered their cries from “We are the people,” to “We are one people,” but unification meant in fact that the nation, and the Berlin museum in particular, had acquired a quite different audience.\textsuperscript{170} In the years after 1990, it was apparent the museum resonated with a western, not eastern crowd. Without any similar equivalent in the East, GDR citizens had initially stormed the gates of the MVT, and were even a source of hope for the museum’s renewal.\textsuperscript{171} Yet the numbers quickly fell off, and the representation of visitors from the former East German neighborhoods was quite small by 1996.\textsuperscript{172}

Commodification was a problem that permeated the museum more deeply than perhaps the institution liked to admit. It was evident in plans for the final phase of the MVT, yet unrealized in 2004, which entailed the creation of a “museum lane.”\textsuperscript{173} The design envisioned an exhibition space that would have an “actual” street banked by a number of “shops.” Examples of transportation technology would populate the museum lane itself; in fact, visitors could literally traverse a short history of transportation by


\textsuperscript{169} On the depth of “divided consciousness” that existed after unification, historians Arnd Bauer-Kämper, Martin Sabrow, and Bernd Stöver note a 1995 Noelle-Neumann/Köcker demographic study, in which 32 percent of eastern Germans felt themselves to be primarily “German,” but 49 percent still felt “East German,” while 66 percent of western Germans felt themselves to be “German,” and only 11 percent first as “West German,” Bauer-Kämper, Sabrow, and Stöver, introduction to \textit{Doppelte Zeitgeschichte}, 9.

\textsuperscript{170} Philipsen, \textit{We Were the People}.

\textsuperscript{171} Fördervereins des Museums für Verkehr und Technik, “30 Jahre Förderverein.”

\textsuperscript{172} Vorwerk, \textit{Besucherbefragung}, 142.

weaving among bikes and automobiles placed in the street. Cross-sections of the street would reveal not merely construction technology, but the “net” of sewage and city, or life-support, systems underneath as well.\textsuperscript{174} Visitors could also drop into shops, such as a bakery. There they would learn about the “production technologies” of bread and other cottage manufactures, among which the museum included “housework as unpaid labor.”\textsuperscript{175} Entertaining and educational, the exhibit was perhaps Gottmann’s supreme articulation of giving the visitor as much freedom to encounter the social complexities of technology.

Though the capitalistic tone of the exhibition was matter-of-fact, it was still problematic. On the one hand, the lane showed the ways that a capitalist economy permeated relationships in everyday life: “all the positions represented in the area of production technology bear a characteristic of capitalistic commodity production: … the rebuilding of a lending house… and the waiting room of an unemployment office should make these connections truly ‘visible.’”\textsuperscript{176} On the other hand, the tensions of Gottmann’s marketplace policy were most clear in this last expression of his vision. Within this particular space, Gottmann’s visitor was not merely a liberal democratic citizen, but quite definitely a consumer. However, consumption in Germany was not exactly “free,” or to be more precise, costless, liberating, or unconditioned. It was unfortunate, but fitting, that the publication promoting Gottmann’s vision also included advertisements within its pages.\textsuperscript{177} Secondly, by making an exhibit out of the actual conditions of everyday life, the room for technological possibility, and therefore public control over technology,

\textsuperscript{174} Ibid.
\textsuperscript{175} Ibid.
\textsuperscript{176} Ibid., 36.
\textsuperscript{177} Jörg Schmalfuß, conversation with author, 26 May 2004.
disappeared. Even if technologies posed social problems, the notion of agency in this context failed to make sense.

By the end of the 1980s, the museum yet failed to avoid a critique of liberal democratic society presented by the sociologist Jürgen Habermas, who had challenged the notion of a free consumer in his work, *The Structural Transformation of the Public Sphere*. Habermas had contended that corporate interests and the structure of information exchange prevented a truly equitable public sphere. Affluent participants, who were willing to pay for sleek and abundant advertising, ever had the advantage. He repeated this opinion in an interview in 1994, when commenting on the stability of republics in the aftermath of unification. Ultimately, he felt that political stability was rooted in citizen mentality. However,

such a network of motives and opinions, communicative forms and practices cannot be created with administrative means, and [yet] it constitutes the yardstick for measuring the political civilization of a community.\textsuperscript{178}

From the viewpoint of this critique, there was a two-fold problem with freedom, or lack of direction and structure, that the museum offered. Creating a web of technology in all its complexity certainly showed the problem of agency in a world of powerful technology. However, the complexity was overwhelming without some guidance. Undoubtedly, the museum could not simply administer or force critical thinking, an opinion with which the educator Freire would agree. The museum nonetheless adopted a problematic stance, which might have been criticized by Habermas's contemporary and contender Niklas Luhmann when he wrote

\textsuperscript{178} Jürgen Habermas, "A Conversation about Questions of Political Theory," in *A Berlin Republic: Writings on Germany* (Lincoln: University of Nebraska Press, 1997).
The communication of ignorance relieves authority. Whoever communicates knowledge absorbs uncertainty and must consequently take responsibility for the truth or untruth of his knowledge. Whoever communicates ignorance is excused.\textsuperscript{179}

Moreover, while challenging the efficacy of intentional and individual human action, the museum simultaneously permitted the presence of commercial forces – literally and in literature – that banked on the opposite. Proclaiming that the museum had no right to provide explicit direction did not make subtle influences upon the viewer disappear.

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Well after unification, the MVT continued to reflect a consciously critical view of technology. For instance, Gottmann and his staff persisted in contending with Nazi legacies and nationalized technology. They underscored how technologists during the Third Reich, like aeronautics pioneer Wernher von Braun, had shirked ethical responsibility for their creations in an exhibition titled “Technology alone was my Führer” (\textit{Ich diente nur der Technik}). In addition, Gottmann vociferously protested plans that would transform the pioneering Peenemünde rocket center into a historical site without addressing the wartime use of slave labor.\textsuperscript{180} For his individual engagement and


initiative as a citizen whose efforts supported democratic society, Gottmann received the Order of the State of Berlin in 1993.\textsuperscript{181}

Yet the larger problem regarding industrial or technological aesthetics lingered. Already, attractive aesthetics were a fact of museum exhibitions because of the understandable desire to encourage people to come through the door in the interest of democratic education. There was also the case of increasing competition from a host of other enticing media options. Between the sleek airplanes and small microchips of the computer revolution, visitors struggled to grasp the latent “pictures of progress,” which remained in the MVT exhibitions as well.\textsuperscript{182} Despite the effort to contextualize technology within a “web of relations” – political, economic, cultural or otherwise – exhibits in the MVT therefore contained an inherent positive bent. Given the wonders of technological innovation, this was unsurprising and perhaps endemic. Moreover, fighting to create a space for responsible, educated, and independent decisions on technology was not easy in a city with senators that wanted to sell off the collection.\textsuperscript{183} Though museum guides lost the multi-page advertisements of 1990, the struggle for consistent public financial support clearly created problems. On balance, the politics of technological display ultimately overwhelmed the effort to problematize aesthetics in the museum.

Thus, while Gottmann attempted to offer a completely unconstrained technological education, the democratic intentions behind his “marketplace of ideas” were obscured and compromised. Museum designers tried to create a framework that

\textsuperscript{181} "Leistungen zum Wohle der Allgemeinheit gewürdigt," Der Tagesspiegel, 2 October 1993.
\textsuperscript{182} Ursula Winter, "Industriekultur: Fragen der Ästhetik im Technik- und Industriemuseum," in Zacharias, Zeitphänomen Musealisierung. In the difficulty of exhibiting microchips, or other technologies barely visible to the naked eye, increasing smallness corresponded with increasing technological prowess. Even though the museum attempted to display the chip “with a wink,” by setting the miniscule object on a large, white pedestal, this was an ironic gesture that was probably only recognized by very few.
allowed maximum choice and flexibility for the viewer. While the anti-authoritarian impulse recommended itself to democratic principles of education, the museum simultaneously made choice and critical engagement difficult. Wanting to avoid the problems of fetishization, there existed an unmistakable aesthetic to the museum that buttressed them. Though the museum attempted to avoid taking “sides” in the Cold War conflict, it nonetheless reinforced capitalist and Western alliances on an “island” whose inhabitants were famously disparaging of these allegiances. That was because the museum’s presentation of the social and political entanglements of technology made acceptance, rather than active engagement, more likely. In trying to negotiate a third way between a “pure” technological history and a blatantly ideologized viewer, this almost anti-utopian museum may have inadvertently contributed to a politically neutralized viewer, which lent itself to the politics of those in power by promoting acceptance of the status quo.

In particular, the MVT bolstered the ways that their visitor was a commercialized viewer, which was, in point of fact, an ideological aspect of the museum that had no small bearing on social and Cold War politics. After World War II, “consumption and the quality of everyday life rapidly emerged as important battlefields upon which the East-West conflict would be fought out.”¹⁸⁴ Consumerism in West Germany became, in one historian’s words, “the source of core values for the nation” and “exercising free choice in a free market context came to figure as the very embodiment of the democratic

free citizen." The significance of economics for culture was not limited to technology museums alone. Issues involving display in art museums of "late capitalism" echoed those of the MVT, ranging from the "labyrinthine" quality of the Museum of Modern Art in New York to a minimal, industrial museum aesthetic that created safe, if not utopian, spaces to which viewers fled from their over-technologized lives for brief moments. Alternatively for technology museums, the museologist Treinen argued that they became sanctioned spaces in which to contain technology and allowed society to cordon off technological fears from everyday life. Whether the danger of technology was located primarily outside or inside the museum, displays in the MVT helped to neutralize fears and thereby served not so much as futuristic utopias (though the futuristic aspect was present), as modern-day Edens of escape.

Visitors responded to these dimensions of the museum. As the museologist Treinen noted in The Visitor in the Museum of Technology, only socialized adults said that "Learning" was the meaning of a museum visit in surveys; "ideology-free" children instead wrote down "Pleasure" (Vergnügen). Many in the MVT public played the consumer role perfectly; they picked what they wanted to see, which were above all railways, and consumed what the museum had to offer. Without a doubt, the meaning of postwar public education was complicated, involving some balance between the public's

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185 Crew, "Consumption and National Identity," 7; Erica Carter, How German is She? Postwar West German Reconstruction and the Consuming Woman (Ann Arbor, MI: University of Michigan Press, 1997), 24.
188 Ibid., 161.
Chapter 4

desires and their ultimate interests. However, playing to the purchasing power of the public through the language of aesthetics in the end frustrated the museum's ability to foster critical independence. A supreme symbol of the difficulties of democratic technological education in the West Berlin museum came well after the cessation of hostilities, but exemplified its long-standing Cold War, or economic and political, commitments: a beautifully-restored and shiny-chromed Raisin Bomber, once West Berlin's chief provider of consumables, crowned the newly opened energy-efficient glass wing of the MVT in 2001. 189

Figure 23 – The Raisin Bomber "Skytrain"

The ship has sunk. Designed by waking dreamers, built as a multi-colored sailing vessel ... in the end it hardly moved anymore: a rusted chunk of iron. Petrified. Sunk at sea without a storm.

The wooden raft carries the shipwrecked sailors: perpetrators and victims together, divided between those disillusioned people who no longer believe in land, and the hopeful ones who are looking out for new isles of the blessed, and who consequently do not see the Titanic, which some time ago set its course straight for them in order to rescue them.

-- Joachim Walther, *The Raft of Utopia*¹

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**Conclusion**

Given the strong political dimension in all four museums, it is seems fitting that their fates paralleled, to some extent, the states to which they belonged. Reaching full capacity by the mid-1980s, the Deutsches Museum expanded well beyond its “Museum Island” in the next decade. A branch devoted to air and space technologies opened in the former airfield of Schleißheim in 1992 (with 50 airplanes, helicopters, and gliders, and a EUROPA rocket as well); 1995 saw the opening of the Deutsches Museum Bonn, which focused on technology invented after World War II, and for its 100th anniversary in 2003, the Deutsches Museum created a new center of transportation technologies housed in renovated convention halls originally dating from 1907.² An opposite destiny met the former Eastern institutions. Despite the efforts to remake the Schwerin museum into a science center as it moved out of the castle, difficult finances forced drastic reductions. A dearth of state funds left the Technological Museum of Mecklenburg-Vorpommern

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² Füßl and Trischler, eds., *Geschichte des Deutschen Museums*, 202-08.
Conclusion

without any building for some time. With the help of regional patrons, the museum office finally relocated to the coastal city of Wismar after 2004, where it began to administer exhibitions in two cities.\footnote{Technisches Landesmuseum Mecklenburg-Vorpommern, "Homepage," Verein Technisches Landesmuseum Mecklenburg-Vorpommern, http://www.tlm-mv.de/museum/index.php (accessed 28 February 2006).} The story in Dresden was much happier; the technical museum eventually became the Technical Collections of the City of Dresden and moved into a former camera factory that dated from 1898. In Berlin, with a shiny new building but continued problems of finance, the “third way” became the Deutsches Technikmuseum Berlin (German Museum of Technology, Berlin) in 1996 and continued to sail somewhere in between the extreme Western and Eastern outcomes.\footnote{"Verkehrsmuseums hat neuen Namen," Berliner Zeitung, 21 September 1996.}

The historian Jürgen Kocka has observed that “historical comparison serves critique,” and contrasting museums in Cold War Germany accomplished this task along several lines.\footnote{“Der historische Vergleich dient der Kritik,” in Jürgen Kocka, "Nach dem Ende des Sonderwegs: Zur Tragfähigkeit eines Konzepts," in Bauerkämper et al., Doppelte Zeitgeschichte, 375.} Spanning institutions from large to small, urban to agricultural settings, and east to west, comparison has illustrated, for example, several points for the field of museum studies. First, the Deutsches Museum has proven to be a continual touchstone for technology museums after World War II in ways that it probably could not have imagined, especially in the East. The issues that guided the formation of all three successors confirm the continued impact of the Deutsches Museum upon technology museums since its inception. Second, an examination of local contexts demonstrated the extent to which immediate surroundings shaped the presentation of technological history. Most importantly, a tour of these museums showed how the development of museology, and the museology of technology in particular, formed under the conditions of the Cold
War. An intellectual and cultural history of museology, which has yet to be written, will have to include what seem to be pioneering efforts by Russians and East Germans. More importantly, a new history of museology will take into account how the larger geopolitical dimension shaped museum issues.

For German history, a comparative cultural examination bridged the East-West divide through the common issues of technology and history and the institutions of education and the public. These four museums served as a prism through which to consider East and West political culture and the ways that Germans – if one can use such a unifying term – defined issues within and across borders. They were often opposed to each other, occasionally in tandem with one another, and certainly enmeshed in a geopolitical arena largely of the USSR’s and US’s making. German postwar history, whether focusing on East or West, requires more than most Cold War histories a “double” lens.  

Such was the case, at least, for the education of technology. Looking at the democratic purposes of technological exhibitions provided a way into the larger problem of education and politics in East and West Germany after fascism and the atomic bomb.

The contradictions of democratic technological education

How and why did educators contradict themselves when explaining the political benefits of learning technology? In four different technology museums, administrators and staff argued not merely that technology was intricately tied to the individual and society, but that it was positive for individuals, society, and geopolitics. In the Deutsches Museum, technology was culture. This characterization was advantageous: cultural

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6 Bauerkämper et al., *Doppelte Zeitgeschichte*. 
technology meant personal enrichment for the individual, grounded values for society, and thus – proponents argued – encouraged liberal democracy. Museums in the East represented technology by contrast as a scientific revolution. Although Schwerin and Dresden emphasized different points, they both maintained that, in the end, technology would create personal liberation. However, museum educators also qualified, or circumscribed, the idea of liberty. They maintained that technology in the larger historical process would eventually create a socialist world, and thus, the equality and freedom of all humanity. Finally, though the West Berlin instance was quite critical about technology, if not anti-utopian in many instances, technology remained an overarching, and sometimes beautiful, web. The benefits were therefore more difficult to see, since technology often affected people – individually, locally, across East and West – in unexpected ways. However, the museum still supported the learning of technology, which personnel deemed necessary for an independent, mature, and democratic visitor-voter. In all these museums, the education of technology was also the education of democracy.

Nonetheless, the museums managed to undermine the aspect of democracy that, after fascism, called for individual autonomy. The cultural approach to technology in the Deutsches Museum, for example, had hierarchical and conservative implications. The institution supported individual genius, but genius by its very definition belongs to a special few. Ultimately advancing the economic prerogatives of big industry and the state, the Deutsches Museum was always weighted towards the powers that be, despite its effort to bridge or ameliorate difference on the local, national, and international levels. In Schwerin and Dresden, the assertion that education served the needs of the individual
personality or heart was often precisely that: an assertion. An individual's development in the technological revolution had to include the directives of a militaristic party as well. This, however, did not portend well for a peaceful resolution to the cold conflict if museum lessons were indeed successful. Finally, the museum in West Berlin may have intended to converse with its visitors in an anti-authoritarian manner, and thereby foster their ability and right to make independent conclusions. Yet depicting technology as a web tended to mute the notion that an individual, or society at large, could actually shape the future, especially when the fact of technology was so taken for granted. The museums were, for democratically minded institutions, difficult spaces for the individual, or notions of agency, or both.

What is striking about the contradictions is that educators, despite their geopolitical or ideological commitments, shared a common approach to the problem of how individual society related in an age of advanced technology. Museum affiliates held up the twin goals of responsibility and interconnectivity in varying ways. Responsibility was a character trait that usually defined a single individual, though societies could be technologically responsible too. In the end, the point was that a responsible individual was a socially aware one. The weight that the Deutsches Museum and the Polytechnisches Museum Schwerin both placed on the notion of responsibility made them similar in this regard. At the same time, interconnectivity was not merely a description of the ways that technology wedded people together, for better or worse. Interconnectivity was also prescriptive, since recognition of an interconnected world would encourage appropriate individual behavior towards an assumedly common goal: improved connections among people. When things were too well interconnected,
however, connections became constraining social and technological entanglements. This was certainly very true in the Dresden example, and to a good extent in West Berlin as well.

Responsibility and interconnectivity are far from offensive ideals, but their presence in technology museums became nonetheless problematic. It was precisely in the face of an increasingly complicated society that the sociologist Max Weber famously brought together the ethic of responsibility and the goals of education at the beginning of the century. According to his 1919 lecture, titled “The Pursuit of Precise Knowledge (Wissenschaft) as a Vocation,” the most extensive investigation of a given topic would not enable an intellectual to decide the merits of this or that ideal, and could not save anyone from the “stern duty of personal choice.” Nonetheless, a teacher could strengthen an individual’s ethical powers. Weber thus set forth an program for educators, to which many reasonably continue to hold, to “create clarity and a sense of responsibility” in his students. In technology museums after 1945, however, the problem was whether individuals in fact possessed enough room to make their own decisions when it came to issues of technology and democracy.

For the generation after the second world war, a radio exchange in 1965 by the sociologists Theodor Adorno and Arnold Gehlen defined the problem of autonomy. On the problem of maturity, Gehlen queried Adorno:

Do you really believe that we should burden all people with the task of dealing with fundamental problems, of expending their reflective energy, of making the sorts of fundamental mistakes with profound after-effects that we made because we attempted to chart our own course? I would very much like to know.8

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7 As quoted in Ringer, The Decline of the German Mandarins, 353-55.
To which Adorno responded, "simply yes." He claimed to have a picture of "objective happiness and objective despair," but nonetheless declared, "as long as people are exonerated and are not expected to exercise complete responsibility and self-determination, their happiness in this world remains an illusion..." The claim that individuals or small groups should maintain autonomy was not merely about antifascism, but also involved the larger question of independence from the nation, modern political society, or whatever collective was at hand. 

*The unstable foundations of technological education*

Limitations upon independent decision-making in technology museums actually stemmed from the ambiguities of technology and history. Though they presented their cases confidently, the logic and rationales that educators used to substantiate their arguments and goals were unstable. The psychologist Jerome Bruner made a similar point when evaluating the ways that psychological theories of cognition have adopted theoretical models from physics. Though psychologists have relied on the more "concrete" status of physics as a means to give their own science a firmer basis, physics — and science — is not exactly stable, and more to the point, psychologists are not physicists. If "psychology is ever subject to physics envy," as the quip goes, so too was technology museum education in the Cold War.

Part of the problem stemmed from technology itself, which seemed pretty stable given its concrete results and proximity to science. Yet it was not. While the most immediate image of technology is probably that of a *tool*, or a mechanical object,

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9 Ibid.
11 Jerome Bruner, "A Short History of Psychological Theories of Learning."
Conclusion

technology has come to encompass much more. Philosophers and sociologists of the twentieth century have focused on the ways that technology is an extension of human agency – tools after all have ultimate ends – so that the state apparatus itself could be considered a "technological advancement." They have also considered the sociological impact of technology, which makes it a relationship or web of relations.\(^\text{12}\) Communist and socialist ideologies depicted technology with world-transforming power as well, so that it operated like a function.\(^\text{13}\) In addition, Andrew Feenberg, a philosopher of technology, has noted how technologies structure daily life and their analogous operation to money and power. Whereas money, which is the paradigmatic medium, deals with the exchange of objects and services of "equivalent" worth, and power demands obedience, Feenberg argues that technology deals with systems of productivity, performance, or efficiency.\(^\text{14}\)

Emphasizing one model of technology over another in the museums had powerful consequences for social and political relations. In general, the dominant metaphor for technology either was a tool (the Deutsches Museum), a revolutionary transformative process (Schwerin and Dresden), or a systemic web of relations (Dresden, again, and West Berlin). At moments, educators even used all three. All of these metaphors, and the fact that technology had its own set of efficient values, played into the responsible or interconnected practices that visitors were supposed to adopt. Tracing the development


\(^{13}\) For more on the "scientific-technological revolution" of socialism, see Chapter 2.

\(^{14}\) By attributing to technology the characteristics of a medium, Feenberg reconciles critiques of technology that are offered by Herbert Marcuse and Jürgen Habermas in the aftermath of Nazi Germany and Hiroshima, Feenberg, "Marcuse or Habermas: Two Critiques of Technology."
from the Deutsches Museum to the West Berlin Museum of Transportation and Technology suggests that, as understandings of technology became less stable, and the metaphor of system began to compete with those of tool and function, the political lessons changed.\textsuperscript{15} Moral instruction moved increasingly from active responsibility to the encouragement of localized participation, and even a passive acceptance of interconnectivity. Because technology was also a medium, however, systems of productivity, performance, or efficiency themselves became valuable outside of any articulated, or political, ends.

Yet technology museum educators, when offering their judgments, felt that they could still appeal to objectivity, and it was a standard not limited to issues of technology. Sometimes the objectivity came from technology's association with science or role in undeniable "scientific" world historical processes, and other times even from a focus on the artifact – or object – alone. From Munich to Schwerin, Dresden to West Berlin, intellectuals both inside and outside the museum also used the notion of democracy as a legitimizing force in itself. Educators, especially in the East, felt that there were grounds upon which to regard the intertwined progression of democracy and technology as

\textsuperscript{15} To go a step further in viewing the larger arc from the Deutsches Museum to the MVT, three thematic areas in particular reveal the challenge of technology's increasing dynamism for museum representation: 1) atomics (weaponry and energy) and the difference between "Nature" and the environment, 2) goods manufacture and the tension between production and consumption and 3) media and communication technologies around the theme of information exchange. When it came to harnessing energy, all the museums offered some position on the "Technology-Human-Nature" equation that increasingly had to maintain an equilibrium with environmental considerations; consider the differences between the Deutsches Museum and Schwerin against the TMD and the MVT. "Nature," could no longer represent the challenge of resources primarily, but an Environment surrounding humans that needed to be respected. Questions of resource and environment created tensions for the second thread through the museums when it came to the provision of basic and luxury items. However, goods manufacture also had implications for the relationships within society between producers and consumers, which corresponded to the different emphases placed upon ethics of responsibility versus interconnectivity. Finally, as communication became more dynamic, information was no longer an "object," or data, to be transmitted, but involved a system of exchange, which also affected knowledge claims (and thus, the authority of museums). These three areas were also related to one another.
guaranteed, or at least more faithful to either laws of nature or organic developments in the world. In the end, museum educators alluded often to the notion of objectivity when suggesting that technology could or would benefit humanity in a specifically democratic way. However, as political thinker William E. Connolly pointed out, republican, or democratic, values are ever contested, making the connection between democracy and objectivity a dangerous one.

There was, nonetheless, a certain connection among technology, ideological versions of democracy, and objectivity. As Brazilian educator Paolo Freire has argued, objectivity cannot be separated from subjectivity, or in a more basic formulation, objects are objects through recognition by subjects. Recognition, however, is not limited to the experience of seeing things like technological gadgets. It is a process that requires reflection and consciousness on the part of the viewer, who incorporates information from the senses into frameworks of understanding that have been built across time. Thus, when educators used the idea of objectivity, they also dealt with notions of history — human, national, or otherwise. The argument that objects persist throughout time, as well as notions of humanity or human capacity, necessarily jumps over into the realm of the history. And history, as evinced in the fight for democracy in Cold War Germany, is not indisputable. The connection between objectivity and history was knowledge, which humans arrive at through a process of general or authoritative acceptance.

Knowledge itself, ultimately, was the soft ground upon which educators tread when they taught technology, let alone talked about democracy. As educators appealed to objective, or ethical and historical, standards, they were neither entirely ignorant of the

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16 Or “Subjects,” Freire’s term for consciously emancipated individuals, Freire, Pedagogy of the Oppressed, 50.
disputed nature of their claims, nor were they misappropriating the notion of objectivity altogether. Some were alert enough to realize that, in the words of intellectual historian Thomas Haskell, "objectivity is not neutrality."\(^{17}\) East Germans would have enthusiastically agreed with this, for they never thought they were being neutral in their efforts to be objective. When the museologist Klaus Schreiner asserted "museums, as institutions that mediate ideology, do not stand 'neutrally' above the classes," he was in fact proposing an alternative. Museums in socialist society were instead to be "integrated with respect to classes into the class society of today and fulfill specific, determined functions also related to class."\(^{18}\) That is to say, East German ideologues and educators understood the ways that objective knowledge was created by the verification of a broad public, and that it had to serve the interests of that very same public. West German educators, in a society committed to democratic interests after nightmare of Nazi fascism, understood this too, and in contrast to the authoritarian strictures of their fraternal twins, theirs was the more honest problem.

*The problem of antifascist education in technological society*

Instabilities inherent in the notion of technology, democracy, and above all, objectivity created the context for educational contradiction in technology museums. Through objectivity, museum educators continued to exercise a position of authority above the public, but objectivity could never serve as an absolute foundation from which to make pronouncements about political matters. In itself, authority or expertise was not a problem, given the need for professional advice in an increasingly interdependent and

\(^{17}\) Haskell’s essay, “Responsibility, Convention, and the Role of Ideas in History,” is a thought-provoking look at the emergence of an idea of responsibility that my responsibility-interconnectivity argument parallels to some degree, Thomas L. Haskell, *Objectivity is not Neutrality: Explanatory Schemes in History* (Baltimore: Johns Hopkins University Press, 2000).

\(^{18}\) Schreiner and Weck, *Studien zur Museologie, IV*, 9 (emphasis added).
complex world. Yet technological educators traded not merely in information, but powerful ideals and attitudes. First, they upheld the ideal of individual, independent development in the face of technology's broad social impact. Second, they made strong arguments in favor of technology, a polarization that ran counter to the obligations of a public institution to mediate different positions in society.

Undoubtedly, the limits of public involvement with regard to large, complex questions like technology existed even when the practice of democracy was robust. The first problem was whether the public could comprehend the issues, which was followed quickly by a second: whether they cared enough even to try. In the years after World War II, television was responsible for a steady decline in the participation of Americans in public life. The same can safely be said of West Germans. Political scientist and information analyst Doris Graber astutely summed up the problem with demands for more "democratic" participation when she asked:

Is participatory democracy really feasible when modern mass publics are far too large to engage in policy debates where citizens have a reasonable chance to make themselves heard? Is it practical given the complexity of the public policy issues that face modern societies and often require insights based on high-level technical expertise? And is it realistic considering the disinclination of modern citizens to engage in such debates?  

When citizens did indeed care and seek information, as with nuclear technology, there was another challenge. Science, in the words of philosopher Michael Polanyi, was its own "republic" that outsiders to the realm could not truly influence. The internal logic of science meant that curbing genetic technologies, for example, by limiting public funds or

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19 Haskell, The Emergence of Professional Social Science, 28-9, 43-44.
creating law would not ultimately dictate the paths of scientific research. Thus, in the vibrant scientific culture of the Cold War, the question of whether the public could shape its articulation was a live one.

When technology museum educators tried to “democratize” education, however, they did so in a way that reinforced the limits of public engagement though they sought the opposite. The measures to increase museum attendance in traditionally neglected demographic sectors were undoubtedly important for the institution’s democratic aspirations. In addition, the adoption of certain types of representations that spoke to “everyday” (as opposed to elite) visitors, which included topics of general interest and methods of entertainment, did seem to “broaden the franchise.”

Museums gave the public what they wanted, which may have seemed anti-authoritarian, but this neither addressed policy issues in a deep way nor tackled the question of public control over the national technological agenda.

As advocates of responsible or interconnected behavior on the part of their visitors, technology museums therefore had contradictory notions with regard to the standard of individual autonomy demanded by antifascist democracy. On the one hand, they placed responsibility largely upon individuals by suggesting that the solutions to technological problems remained mostly on the level of individual or communal agency, rather than showing how technological dilemmas were systemically conditioned.

However, if educators emphasized the impact of technological systems, the power of

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23 Randall Collins defines democratization as comprised of two key dimensions: the extent of the franchise and collegial power. The extent of the franchise is the “proportion of the populace allowed to take part in politics” while the degree of collegial power is the magnitude to which political power is dispersed among institutions such as electoral bodies, assemblies, councils and legislatures, Randall Collins, "A Geopolitical Theory of Collegial Power," in Macrohistory: Essays in Sociology of the Long Run (Stanford, CA: Stanford University Press, 1999), 114.
agency correspondingly lost potency across the board, for individuals as well as corporations. The responsibility of institutions, industries, or states did not then become larger. Either way, technology museums tended to treat students as objects, or, in the extreme case of East Germany, blank pages upon which to inscribe their lessons.

Put another way, technology museum educators reproduced what the Hegel-inspired educator Freire termed as the “Teacher-Student contradiction.” In his depiction of the relationship, a teacher had access to information and ways of thinking that could correct and potentially liberate the student. Yet Freire’s educational ideal also held that students needed to achieve their own acts of cognition, which potentially meant that they would differ with their intellectual betters. How teachers mediated this difference in the relationship determined whether education would be of the “banking” type – in which information is simply transferred or deposited from one to another – or “problem-posing” and liberating. The hierarchical relationship of education was a problem for free, equitable, and fraternal democracies above all, for how was one supposed to educate from a position of authority about complex technology and yet relinquish the superior position at the same time?

_Ideology and utopia in technology museums_

The representations of technological educators were not necessarily illegitimate, because many certainly believed – and continue to believe – in the connection between technology and human happiness, and even democracy. The contradictions, however, lay in the attempts to present controversial arguments as accepted knowledge, and this is what made the museums both utopian and ideological. Ultimately, the problem of museum personnel lay in conflating themselves with the public, and generalizing the
diverse public as well. By neglecting to recognize and call attention to their singularly
invested and influential participation in a society-wide discussion, technology museums
did not take the dialogue or communicative aspect of their venture far enough.

This would not have been an easy prospect, given that technology museum
workers themselves had double motivations or obligations: the educators’ desire to
develop the viewer’s intellectual and ethical independence on the one hand, and attitudes
that often favored pro-technological policies and reinforced their own authority as
technical intellectuals on the other. The tension in fact mimicked the earlier conflict
between Bildung and “modernist,” or accommodating, elites, but within a single
profession. In fact, the commitments were triple for technology museum educators,
since in the latter half of the twentieth century they also had to contend with the
development of another kind of science, the Wissenschaft of museology. Conceivably,
there was even an additional demand, for technology museum educators were also a part
of the emerging discipline of the history of technology.

Perhaps the multiple identities of museum educators explained why they tried to
make their subject matter attractive to everyone. Aesthetics and amusement in
educational matters, however, was a sort of sugar-coated pill by which museums
provided a place of history, entertainment, and fascination — this was more the case for
the western than eastern instances — to as many people as possible all the while slipping
in education.\footnote{Treinen makes a similar observation when referring to the heterogeneity of museum, Heiner Treinen,
"Interpretation," 26.} This was a problem considering that new exhibitions of technology
included venues outside educational institutions, such as the parade of futuristic
household technologies in the Experimental Prototype Community of Tomorrow
(EPCOT) center at Walt Disney World. “Something for everyone” was also a utopian project, because there were in fact multiple publics whose interests were either at variance with or absent in the museum articulations. Many parties (e.g. “the” public, the state, industry, fellow educators, or scientists), who had different views of the museum’s purpose, confronted designers as they decided to whom technology museums primarily “belonged” in creating their depictions. Finally, high attendance numbers legitimized the museum itself, which also motivated personnel to create attractive exhibitions.

However, technology museum education did not help viewers to understand the complicated and varied interests of their fellow visitors, or for that matter, the museum itself. At bottom, museums were not explicit about their many publics and this was problematic. In order to display technology in a non-authoritarian manner, museums needed to make clear that someone – not everyone – was in control of the technology. In order to make their representations non-utopian, they needed to show that someone – again not everyone – might be on the disadvantaged end of the stick. For that matter, there was little, if any, recognition of how education itself, which often improves the economic lot of those who undergo its certification processes, leverages political behavior. It did in the GDR, in any case, when parents wanted their children to go to university, and needed to keep authorities happy in order to not jeopardize the possibility.25 Also in the FRG, even after the tightening of job prospects for university graduates after the heyday of economic prosperity, higher education still meant a good amount of privilege. As an institution of the public with much cultural power, and as a medium for the conversations that they so desperately desired, technology museums did

not make visitors very aware of the conflicts at work in discussants, which included
themselves.

Thus, while the authoritative view of technologists and educators was certainly
warranted given their expertise, the manner of their articulation, at least in technology
museums, conflicted with the aims of democratic politics. Because reason is the basis of
a democratic society, decisions about technology had to be attempted through reasonable
measures. Democracy rests upon the acceptance of "a policy presumption in favor of the
judgment of those who, even after consulting our arguments and evidence, understand
their own interests differently than we do."²⁶ Yet technological museum educators were
not shy when they suppressed the social tensions of technology in order to support
national cohesion in the face of geopolitical challenges. They were, after all, educators.
By masking the relations of social power in their exhibitions, however, they were also
ideological, and even in tension with the demands of democratic practice.²⁷ Technology
in the museums therefore assumed the characteristic of an ideology within
representations of democracy that were utopian: the more stable that technology and its
social consequences seemed, the more ideological it became.²⁸ Without constructive
criticisms of technology, there was little room for social visions other than the versions of
democracy that technology museum educators offered. In the Cold War contest for

²⁶ Connolly, 72.
²⁷ This returns to Althusser's observations on ideology, though the work of Michel Foucault is quite
relevant, such as his essay on "Governmentality," Michel Foucault, "Governmentality," trans. Rosi
Braidotti and revised by Colin Gordon, in The Foucault Effect: Studies in Governmentality, Graham
Burchell, Colin Gordon and Peter Miller, eds. (Chicago, IL: University of Chicago Press, 1991), 87-104.
²⁸ In talking about technocratic consciousness, Habermas observed that it was "less ideological" than earlier
ideologies but more invasive: "It is less vulnerable to reflection, because it is no longer only ideology. For
it does not, in the manner of ideology, express a projection of the 'good life'.... The ideological nucleus of
this consciousness is the elimination of the distinction between the practical and the technical," Habermas,
"Technology and Science as 'Ideology,'" 111, 113. This approaches the notion of technology as ideology
used here.
political power – both in terms of military might and governing legitimacy – education, and the museum, became for politicians and educators a form of instrumental technology.

*The third way, reconsidered*

To highlight the ways that these museums compromised certain democratic ideals, that technology was an ideology, or that education became a political tool does not condemn technology museum education. Rather, such a conclusion calls attention to the ways that technology and education operate in modern society. The ultimate question for technology museums is also a complicated one that still confounds democrats today. At stake is the viability of democracy in an era of high technology within a context of sophisticated education.

As stated at the outset, technology museums cannot help but trade in the most fundamental values for individual and social life. In the Deutsches Museum, technology was culture, but not technology alone; democracy and education were also matters of culture. In the end, man- or tool-made culture proved that better societies were realizable. Yet again, the triad of technology, democracy, and education were part of a revolutionary process in East Germany that would lead to utopian society. While greater productivity measured the success of the historical process or function in Schwerin, Dresden considered greater interconnectivity to be proof enough. An almost anti-utopian third way emerged in West Berlin, where technology, democracy, and education created a web, or market, of complicated relations. However, the incorporation of aesthetics – whether beautiful, sublime, or just everyday comfortable – made the threat of technologies pretty tolerable, and even offered a small escape from fearsome realities. Utopias were already an intrinsic part of museum spaces, but became more so with the
issues of technology, democracy, and education. Ultimately, utopias were, and are, a way of reconciling the tensions between individual, society, and the world.

Thus, the difficulty of the role of a museum – and specifically a technological one – in a democratic society remains. For an institution associated with the rising fortunes of the technological elite, and therefore technological optimism, it is legitimate to ask how critical such a museum can be. Moreover, there is also a question of whether a museum – like an encyclopedic Deutsches Museum or a museum of labor history in Nuremberg – can ever change its fundamental approach once constructed and in operation. It is not clear if a museum can truly ever depart from the intellectual considerations that formed it, or in other words, whether or not the philosophy and outlook of a museum that went into its construction at the outset will significantly shape its message ever afterwards. Finally, the goal of an education without domination is not an easy one, as the museum in West Berlin especially showed. In comparison to the rest, it was the museum most explicit about of its own educational power, and most upfront about the complexities of technology. The least utopian of the bunch, West Berlin's museum was closest to the issues that confront technological display in liberal democratic states of today. At the same time, the MVT of the 1980s was also the most pessimistic about the control over technological problems; in a way, it had lost its utopian hope.

\footnote{If we follow Ruth Levitas’s analysis of utopian texts, utopias are also structural in three ways that map nicely onto the Munich, East German, and Berlin instances. Utopia can be a matter of form in which the good society is described, or a function that focuses on for whom the good life is for, or yet again an issue of “content,” that raises the question of whether such an Eden is even possible, Levitas, \textit{The Concept of Utopia}, 2-5.}

\footnote{The historian of technology Wolfgang König raised this thought-provoking issue, Wolfgang König, Letter to Connie Sehat, 2003.
Conclusion

However, technological museums also possessed intrinsically many opportunities to formulate what the educator Freire called a “pedagogy of the oppressed” in comparison to most educational media and museums. For one, there was some room for two-way communication, as opposed to television and radio formats. Technology museums were, in fact, problem posing, since the entire premise of technology addresses human problems that need solving. As exemplified in all the examples of this study, technological educators also addressed the disadvantages of technology to certain sectors of society, such as workers. Finally, because they portrayed stories of historical process and transformation, human possibility remained. Even when confined to a simple trajectory of machine development, technological processes revealed transformation in the world. Whether used in a utilitarian manner or not, technology museums were, and are, clearly about what humans are and want to be.

In the end, utopianism remains ambiguous. During the Cold War, utopias were authoritarian when they took one plan for all society, subsumed the diversity of peoples under it, and assumed that difference and hardship would melt away. On the other hand, democracy was a utopian project whose ideals contained transformative power. Perhaps utopia seemed dead after 1990, but a careful consideration suggests instead that it was primarily a loss of certain socialist possibility. In the end, utopias seem to be intimately entwined with the modern project, whatever “modernity” might mean. The power of technology, democracy, and education lies still in their seeming straightforward ability to

\[31\] Hettling makes the same point in Manfred Hettling, "Umschreiben notwendig? Die Historiker und das Jahr 1989," in Bauerkämper et al., Doppelte Zeitgeschichte. Consider also, however, sociologist Kumar’s exposition of civil society with utopia. Kumar notes “the tendency, common to most advocates in the West as well as in the East, to elevate civil society above the state. Civil society becomes a utopia – the solution to all the problems accumulated by ‘real socialism’ [...] Civil society simply becomes all that is desired in the making of a democratic society,” Krishan Kumar, "Civil Society," 388.
“deliver the goods,” or fulfill dearest dreams, and create a better life for all – or most – concerned. Freedom continues to have a compelling siren call whose possible realization remains because it is, in Freire words, “not an ideal located outside of man; nor is it an idea which becomes myth. It is rather the indispensable condition for the quest of human completion.”\textsuperscript{32} Perhaps utopias are necessary.

As even the examples of technology museums in Cold War Germany showed, criticism was present in, if not intrinsic to, their utopian endeavors. Though they intended otherwise, when educators of both the GDR and FRG offered the most trenchant critiques of translating democracy into politics against each other, they did so for themselves as well. An awareness of critique showed in the democratic museum movements and also the considerations that went into the West Berlin. Instead of resolving the ambiguities among technology, democracy, and education for students, educators could have gone a step further by better elucidating the ways that certain ideas – such as democracy, freedom, equality, efficient technology – are complex enough to encompass conflicting political positions. Since these ideas were not merely descriptive, but also normative in a way that makes critical thinking and discussion difficult, it was crucial to make students aware of where their power lies. When educational institutions rise to the challenge of facilitating this kind of understanding, whatever the limitations of their context, they help individuals, recognized as such, become “masters of their own thinking.”\textsuperscript{33}

Most importantly, the utopian aspect of technology museums itself was a fundamental critique of society. Criticism is the very function of utopia because any

\textsuperscript{32} Freire, \textit{Pedagogy of the Oppressed}, 47.
\textsuperscript{33} Freire, \textit{Pedagogy of the Oppressed}, 124.
utopian vision contrasts the present to some longed-for other life. In the end, in spite of oft-repeated proclamations about the death of utopia, cold war technology museums were utopian sites, but not merely due to ideological glossing required by geopolitics. Technology and education each had their own utopian impulses as well. By wedding democracy, technology, and education unambiguously together, technology museums ultimately epitomized the persistent allure of utopias in politics well beyond 1945.

34 This is Levitas’s read of Georges Sorel, Levitas, *The Concept of Utopia.*
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