

Baumeister, Bildung, and Civil Service

Social and Intellectual Disputes in Architecture and Civil Engineering in Germany during the Second Industrial Revolution

“Die Kunst ist lange bildend, eh’ sie schön ist.”
(Goethe, “Von deutscher Baukunst,” 1773).¹

In the essay “On German Architecture,” Goethe’s first-person narrator celebrates Erwin von Steinbach, architect of the Strasbourg Cathedral, and develops this cue into a treatise on the relationship between building and art. The text claims, as quoted above, that art spawns form or objects (*ist bildend*) long before it is beautiful, and the text naturally puts buildings at its center as it discusses the subject’s encounter with a monumental work of architecture. Early on, the narrator addresses von Steinbach directly saying “What do you need a monument for! You’ve built the most magnificent monument for yourself,” and claiming that Steinbach shares his fate with the architect who built the mountains high into the clouds.²

Goethe’s far-reaching and absorbing reflections on art and building, as well as the canonical status of his overall work in German literature, philosophy, and education, are a seemly starting point to discuss a problem that was troubling German educated elites, engineers, and architects during the Second Industrial Revolution in the late nineteenth and early twentieth centuries: the relationship between the new industrialism and traditional understandings of learning, art, and selfhood. The latter were rooted in earlier, pre-industrial eras, not least a period that is often referred to as *Goethezeit* (Goethe era). Phonetic and semantic resemblances between *bilden* (to form or cultivate) and *bauen* (to build) also evoke junctions of pre-industrial cultural canons and industrial planning and manufacturing.³ Around 1900, *Bildung* was an asset in Germany that was usually drawn from humanistic high school education and not available to all young men, let alone women. Mastery of Latin and Greek was used as its token skill and entitled people to ascendancy in the government bureaucracy and social order. It made men not only professionals but also respectable citizens

¹ “Art is creative long before it is beautiful.” Goethe, “On German Architecture,” 8.

² “[...] hast du gleiches Schicksal mit dem Baumeister, der Berge auftürmte in die Wolken.” *Goethes Werke*, vol. 12, 7. Both Dorrothea von Mücke and Daniel Purdy emphasize the contribution that Goethe’s essay makes to aesthetic theory and theories of subjectivity. Mücke, “Beyond the Paradigm of Representation: Goethe on Architecture” and Purdy, *On the Ruins of Babel*, 34 and 182-83.

³ “Bauen” is etymologically related to Middle High German *būwen* and Old High German *būan* (Dutch *bouwen*), and its base, as in other Indo-Germanic languages, is “*bheu-*,” meaning “to grow, to become, to emerge” and later “to be” and “to inhabit” (*Duden: Herkunftswörterbuch, Etymologie der deutschen Sprache*, 74). The English word “to build” is rooted in Middle English “*bilden*” and Old English “*byldan*,” and shares the same base, “*bheu-*,” to be, to live (Barnhart, *The Barnhart Dictionary of Etymology*, 124). Reading Kant’s reflections on the term “architectonic,” Susan Bernstein suggests an interdependence “between the unifying structure of *Bildung* [...] and buildings,” a connection between construction and (self) formation through the Latin term *edification*. She also concedes, like others who work with these terms, that the resonance between building and *Bildung* may be specious. Bernstein, “Goethe’s Architectonic *Bildung* and Buildings in Classical Weimar,” 1015. Ellen and Ernest von Nardroff translate “*bildend*” with “creative” (see note 1), not emphasizing such resonances and etymological relations. Debates around the enormously rich and multi-layered idea of *Bildung* emerged, of course, in many other times and places, too. Purdy discusses both Kant’s and Goethe’s *Bildungsbegriff* vis-à-vis theories of architecture. Purdy, *On the Ruins of Babel*, 110 and 137.

4 Gispen, *New Profession, Old Order*, 88-89 and 103; Jarausch, "The German Professions in History and Theory," 17-20; Hortleder, *Das Gesellschaftsbild des Ingenieurs* 168-176. See also Wehler, *Deutsche Gesellschaftsgeschichte*, vol. 3, 125-30; Kaelble, "The French and German Bourgeoisie 1870-1914," 283-289; Kocka, "The European Pattern and the German Case," 22-24.

5 The classic work is Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto*. For questions that emerge from Germany's model status in the Second Industrial Revolution about early industrialization in the German lands, in particular the role of the state in industrializing the kingdom of Prussia, see Brose, *The Politics of Technological Change in Prussia*.

6 The term "mandarin" is widely used in the scholarship on the history of modern Germany to refer to a senior member of the civil service and, in extension, to the institutional scheme, cultural and symbolic significance, and implied ethos of male bourgeois leadership and selfhood, of the German civil service and state. The classic work that coined the term is Fritz Ringer's *The Decline of the German Mandarins*. It deals with the fraught and precarious status of academics' supposed intellectual independence in the German state between 1890 and 1933. The *Merriam Webster Dictionary of English Usage* defines a mandarin as "a person of position and influence often in intellectual or literary circles." An influential application of Ringer's term to the history of technology is found in Hård, "German Regulation: The Integration of Modern Technology into National Culture," 36-44. See also Jarausch, *The Unfree Professions: German Lawyers, Teachers, and Engineers, 1900-1950*, 17-22.

7 Hård and Jamison. "Conceptual Framework: Technology Debates as Appropriation Processes," 2-10. Herf, *Reactionary Modernism*, 152-188.

(*Bildungsbürger*). Anyone who aimed for a higher social and professional position in nineteenth- and twentieth-century Germany—architects, engineers, and other professionals—had to negotiate this asset.⁴

The leading nations of the Second Industrial Revolution were Germany and the United States. While the First Industrial Revolution in England had revolved around coal, iron ore, and the steam engine, the Second's iconic components were electricity, chemistry, steel-and-concrete, and the internal combustion engine. Technologies on the eve of the First World War were thus completely different from those that had been in use around 1850, and the fin-de-siècle witnessed an entirely new experience of industrialization within barely one and a half generations. The German lands had not been part of the First Industrial Revolution and typically experienced slow changes in economic production in the first decades of the nineteenth century. The new German nation state's rapid industrialization in the second half of the nineteenth century, however, has been widely taken to be a model case for modernization and state-building, in particular in the early Cold War.⁵ An important aspect of this process of rapid and massive industrialization was the emergence of engineers as a new social and professional group. As they were trying to constitute themselves as a nascent elite, they encountered fierce competition from existing elites, especially from the nobility, the military, and the humanistically trained mandarins in the higher civil service.⁶

During that same period, engineers also became interested in technology's relationship to such abstract matters as history, culture, art, and the state. As part of this, they contributed to the newly emerging sub-field philosophy of technology.⁷ In this essay, I trace, through the lens of architecture and civil engineering, engineers' efforts for social emancipation and their interest in theoretical questions about technology. Urban planning and its corresponding research, policy, and building practices brought together the agendas of civil engineers and architects, and these agendas also included larger debates about art, history, and nation-state building, as well as theories of technology and industrialization. At stake in urban planning were also more specific political issues such as design aesthetics, state-driven building policy and zoning, stable social and economic orders, and modernization of public health and transportation standards. The First World War intensified and radicalized both ideological and practical aspects of these concerns. I first outline some of the institutional circumstances in which German engineers and architects found themselves during the era of high industrialism, then introduce a small, elite association that was founded in 1909 specifically for academically trained engineers (*Verband Deutscher Diplom-Ingenieure, VDDI*) and examine selected texts in the VDDI's periodical on building, planning, and, in the final part, the philosophy of technology. By philosophy of technology I mean, in this context, an engineer's effort to relate engineering knowledge and work to the metaphysical and epistemic teachings of a canonical philosopher, Arthur Scho-

penhauer. Civil engineers' and architects' institutional and social conflicts are at the center of my essay together with their theoretical reflections on their professional practices in the industrial modernity of the young and troubled German nation state.

Civil Engineering, Civil Service, and Titles

Civil engineering is typically used as an example to demonstrate that engineering is a profession with a great deal of "tradition."⁸ The argument tends to be made defensively, in the assumption that received wisdom claims the opposite. Buildings and transportation are easily imaginable as notable engineering feats in almost all historical eras. They appear to go back to earliest moments of human civilization and thus also support the similarly often repeated and somewhat defensive claim that technology is as old as humanity itself. In the industrial age, the question about the contribution that technology makes to the common good took on new urgency in Germany, both because of increasingly visible drawbacks of industrialization (labor struggles and the First World War, for example) and because of the integration of technology and engineers as new social, intellectual, and material phenomena into pre-existing, pre-industrial social orders and imaginations.⁹

Both in pre-industrial and in industrial eras, architecture has been viewed as a junction where engineering and art meet, not least in monuments such as the Strasbourg Cathedral. Over time, this idea has gone through a range of institutional and intellectual variations and challenges.¹⁰ In Germany, an important site of such conflicts was the *Bau-Akademie* in Berlin, which was founded in 1799 for Prussia's construction needs. It prepared students for technical careers in the civil service and required basic knowledge of Latin and French for admission. Its graduates, Kees Gispén explains, "took great pride in their civil-service standing, paraded as 'classically educated' men" and "[they] looked down with contempt" on other engineers. In contrast to comparable institutions, there was no distinction in the training of architects and civil engineers: the umbrella term for the members of Prussia's technical corps was *Baubeamter* (building civil servant). The rapid industrialization and urbanization in Germany after its unification in 1871 made this increasingly problematic. During the many conflicts about the status of architects and engineers in the civil service (about pay, titles, and admission requirements), opposing sides often broke down along the lines of architects and civil engineers. The term *Bildung* with its political baggage and multi-layered connotations from the arts and humanities played a key role in this. Prominent architects participated in discussions in the late 1870s about whether to drop the requirement of mastery of Latin (as part of the high school diploma) for admission to technical universities. The concern was that engineers and architects who lacked certified training in Latin would lower their social status and that of their profession.¹¹

⁸ Kaiser and König (eds.), *Geschichte des Ingenieurs*, 1.

⁹ Willeke, *Die Technokratiebewegung in Nordamerika und Deutschland*, 117-130; Fraunholz, Hänseroth, Woschek, "Hochmoderne Visionen und Utopien. Zur Transzendenz technisierter Fortschrittserwartungen."

¹⁰ Purdy explains criticism of Goethe's early writings on architecture, for example, which says that Goethe thought in two-dimensional terms and even appreciated the Strasbourg Cathedral only for its façade and never decried the interior. Purdy, *On the Ruins of Babel*, 208.

¹¹ Gispén, *New Profession, Old Order*, 30, 87-89, and 104, quote on 73; "Das Preussische Staats-Bauwesen," *Deutsche Bauzeitung* 1872, 291-299 and 419; *Deutsche Bauzeitung* 1874, 28-29; Purdy, *On the Ruins of Babel*, 14-28 and 47-48.

The disputed status of architects and engineers in the coveted higher positions of the civil service was a platform on which larger questions about state administration, building, class, and theories of technology were raised. Negotiation often happened in terms of job titles such as *Baumeister* (architect) or *Verwaltungsingenieur* (administrative engineer). The umbrella organizations of German engineers (*Verein Deutscher Ingenieure*, VDI) and of German engineers and architects (*Verband Deutscher Architekten- und Ingenieurvereine*, DAI) as well as the smaller association of academically trained engineers (*Verband Deutscher Diplom-Ingenieure*, VDDI) took the helm in lobbying and promoting engineering education, career opportunities, and job titles. The VDDI in particular is well known for its promotion of, and obsession with, academic and civil service titles and their social cachet.¹²

12 Dietz, "Technik und Kultur' zwischen Kaiserreich und Nationalsozialismus," 109; Willeke, *Die Technokratiebewegung*, 120. On the larger social and institutional relevance of such titles, see Jarausch, "The German Professions in History and Theory," 13.

13 Z-VDDI 4 (1913), 353.

14 Z-VDDI 3 (1912), 17 and 305. Z-VDDI 4 (1913), 246, 267, and 458; Z-VDDI 5 (1914), 1, 23, and 176-77.

15 Z-VDDI 3 (1912), 65, 85-88, 241-246.

16 The VDDI continuously lobbied for such an expansion of the curriculum: Z-VDDI 3 (1912), 193-198; Z-VDDI 4 (1913), 369. An exemplary book on this matter was written by the *Regierungsbaumeister* (architect and civil servant) Georg Wickop in 1912: *Die technischen Hochschulen und ihre zukünftigen Aufgaben in den Fragen der staatsbürgerlichen und künstlerischen Erziehung*. It is a version of his inaugural lecture as the provost of the Technical University Darmstadt and was reviewed in Z-VDDI 4 (1913), 167.

Both the large and the small engineering associations lobbied for a national code to regulate the use of titles for engineers in the civil service, so that it would be restricted consistently across regional and municipal governments. The reputation of the umbrella organization of German engineers and architects (DAI) was that it pursued politics almost exclusively in the interests of government-employed architects: they made up about half of its membership.¹³ The larger associations prepared petitions to regional administrations and the ministry of the interior, requesting that only authorized people would be permitted to use the title. They also commissioned legal expert reports.¹⁴ One important example for opportunities for academically trained architects and engineers to join the civil service, if they had sufficient background in law and political science, was to apply for traineeships in district and municipal administrations.¹⁵ Immediate questions arose from this about expanding curricula at Technical Universities and including training in law and political science, economics, and sometimes even ethics and the history of technology. This was meant to make engineers eligible for the coveted senior positions in public administration.¹⁶

Some of the newly emerging interest of engineers in philosophy and history was part of these entrance requirements for the higher civil service. It was also part of a more general male bourgeois self-understanding which emanated from civil servants to other professional groups. Engineers, a nascent social and professional group, were in need of individual and institutional identities, encountered bourgeois mandarins as both rivals and role models, and were keen to find a place for themselves in the rigid and often incongruous social order of Imperial Germany.

The German Association of Engineers with University Degrees (VDDI)

The German association of academically trained engineers, VDDI, fiercely promoted academic engineers' efforts to establish themselves as a new elite on par with the traditional humanistic elites. It was founded in 1909 as an association exclusively for engineers with university degrees and was a tangible product of the ongoing class struggles in Germany between academic and non-academic engineers. The VDDI is also known for its keen interest in philosophical and political theories of technology, which were communicated and debated in its periodical called *Zeitschrift des Verbandes Deutscher Diplom-Ingenieure (Z-VDDI)*. In 1921, it was renamed under new editorship to *Technik & Kultur* (Technology and Culture). It appeared twice a month and ran into the late 1930s when the association and its periodical were eventually merged with Nazi agencies (*gleichgeschaltet*).¹⁷

Civil engineers and architects were well-integrated into the VDDI, not least due to their employment opportunities in the civil service, which were better than those of other engineers. This gave them a distinct and desirable place in the social hierarchies of the German state, very much along the lines of what the VDDI wished for all its members.¹⁸ Civil engineers made up a sizable proportion of German engineers. At key institutions of academic training such as Berlin, Hanover, and Aachen, half of the engineering graduates were architects and civil engineers. Only mechanical engineering had similarly high numbers of graduates.¹⁹ A revealing anecdote related to this comes from local VDDI caucuses that were made up of mining, mechanical, and chemical engineers, such as in traditional mining areas in the Ruhr and Saar areas. When they were asked by the VDDI's Executive Council to share their perspective on the problem of engineers' titles in the civil service, they politely and regretfully reported back that they could not comment on this issue, but that they were well aware that it was crucial for many of their colleagues. There was no such thing as the *Baumeisterfrage* for miners, chemists, and mechanical engineers, they said, ("Lucky them!" they added), and they had much less to do with employment in state administration than their colleagues.²⁰

The book review and bibliography sections of the VDDI's periodical discussed works on civil engineering (textbooks as well as research studies), municipal housing projects, architecture and the fine arts, law (mostly patent law and intellectual property law, but also constitutional law), state and political sciences, and specialized books such as a manual for the Prussian state administration, a book on the relationship between chemistry and judicature, and a book on the construction of the Panama Canal.²¹ This illustrates the VDDI's ambition to provide reading material on humanistic disciplines for its readers and also mimic the tastes of educated bourgeois mandarins. The reading material also relates directly to the

17 Dietz, "Technik und Kultur' zwischen Kaiserreich und Nationalsozialismus," 110, 127-28.

18 Z-VDDI 11 (1920), 99.

19 Z-VDDI 3 (1912), 14.

20 "[...] da es ja eine Baumeisterfrage für die Herren des Hüttenfachs [...] kaum gibt. (Die Glücklichen!)" Z-VDDI 5 (1914), 110.

21 One can find, for example, a review of vol. 1 of the proceedings of the German Society for Sociology (*Schriften der Deutschen Gesellschaft für Soziologie*, Z-VDDI 3 (1912), 92); of a book entitled *Der Panamakanal* (Z-VDDI 3 (1912), 95); of fourteen volumes of Arthur Schopenhauer's *Complete Works* (Z-VDDI 5 (1914), 17-18); of an issue of the macroeconomic periodical *Weltwirtschaftliches Archiv* (Z-VDDI 5 (1914), 135); of a macroeconomic analysis of iron production (*Der Eisenbau. Eine volkswirtschaftliche Studie*, Z-VDDI 5 (1914), 163); of a manual for civil engineers (*Taschenbuch für Bauingenieure*, Z-VDDI 11 (1920), 99); of a book by a professor of law and of political science on the 1919 German constitution (Z-VDDI 11 (1920), 46); of a book on the history of the natural sciences (Z-VDDI 12 (1921), 25-26); of books on the history of Prussian and Swiss early industrialization (Z-VDDI 12 (1921), 56 and 170); of a book on physics and philosophy (*Physik und Erkenntnistheorie*, *Technik und Kultur* 13 (1922), 10); of a book on *Lebensphilosophie* (entitled *Seele und Willenskraft*, *Technik und Kultur* 13 (1922), 44); of cultural and artistic almanacs, one of the Ruhr valley and one of the cultural history of technology (*Technik und Kultur* 15 (1924), 43, and 13 (1922), 23); of a novel about a family of architects (*Technik und Kultur* 15 (1924), 43-44); of a book on applied psychology and industrial technology (*Industrielle Psychotechnik*, *Technik und Kultur* 16 (1925), 47-48); and of books on cultural, Kantian, and existential philosophy (*Individuum und Gemeinschaft*, *Grundlegung der Kulturphilosophie*, *Kant als Philosoph der modernen Kultur*, and *Die geistige Krise der Gegenwart*, *Technik und Kultur* 16 (1925), 46).

entrance requirements of the civil service and the desired employment opportunities for engineers. Evening lectures and other activities in the VDDI's local caucuses covered similar topics and resembled each other remarkably across the nation. Destinations for jaunts were mines, factories, power plants, and airship hangars, and also architectural sites such as local theaters. Annual convivial gatherings for "members and their ladies" were common, and there was cooperation at the local level with other engineering and architecture associations, such as shared newsletters or job fairs. In cities where there were significant academic engineering institutions (such as in Dresden, Karlsruhe, or Darmstadt), local VDDI caucuses fostered connections to them.²²

22 Z-VDDI 5 (1914), 100-111.

The relationship of the small VDDI to the large and powerful umbrella organizations DAI and VDI was relevant for the niche that the VDDI was carving out for itself to support academically trained engineers and architects. For larger questions, the DAI and the VDI collaborated – such as in efforts in 1913 to create a *Deutscher Ausschuss für Standesfragen* (German committee for the (technical) professions) – and the small VDDI made effective efforts to stay connected to their projects: it reported through its periodical about such meetings and motions, and articles, lectures, and notices from the periodicals of the larger engineering associations were reprinted. Engineers and architects used the term *Standesfragen* at the time in this context because it was an important rhetorical tool for traditional academic elites to mark their social distinction, as well as to mark the contribution they made to the *Gemeinwohl* (common good). Traditional academic elites referred to their profession as a *Stand* (estate) and, in doing so, claimed for themselves a rightful place in the time-honored medieval and early modern *Ständegesellschaft* (estate society). Following this example, engineers also called their professional group a *Stand* (the *Ingenieurstand*) and asked engineers to acquire a suitable identity and sentiments: *Standesempfinden*.²³

23 Z-VDDI 4 (1913), 353. Examples are calls for "Anerkennung des Standes" (Weihe and Stamm, "Die Ziele des Verbandes Deutscher Diplom-Ingenieure," 146); "Standesgenossen" (Weihe, "Braunschweig 1922," 202); and "Akademische Standesorganisation" (Weihe, "Der Verband Deutscher Diplom-Ingenieure," 11). See also my manuscript "Philosophy for Engineers: Class Struggle, Theories of Technology, and German Idealism in High-Industrial Germany," under review with *Technology & Culture*.

Urban Planning

The common ground between architects' and the VDDI's concerns comprised matters such as politics, titles, and art, and this becomes palpable in particular when viewed through the lens of urban planning. Projects in urban planning also brought up persistent conflicts in Germany in times of urbanization and industrialization between, on the one hand, preserving traditional village and small-town structures (referred to, from around 1900, as *Heimatschutz*) and, on the other, supposedly "modern" life and urban planning that was believed to be based on rational technology. These conflicts overlap in some ways with the one with which I began this essay: between traditional understandings of learning, culture, selfhood and the new industrial, urban mass society. Construction was intensified in Germany during the entire Second Industrial Revolution: after the

victory in the Franco-Prussian War and unification in 1871 and as part of the massive industrialization ensuing from that, as well as for military goals in preparation for the First World War. Conflicts occurred when old buildings were replaced by new ones, for example, or when medieval or early modern town centers were adapted to increasing traffic, speed, and updated standards in public health.²⁴ In the VDDI's periodical such issues were conveyed in literature and research reviews, articles on social welfare and living quarters for middle classes and veteran WWI soldiers, housing scarcity and social order, and political conditions after the Revolution in 1918/19.

Urban planning agendas, and their wide-reaching echoes in larger political and cultural discourses, were discussed in the VDDI's periodical through contemporary pertinent literature. Before the War, this literature was often based on case studies from Great Britain—the supposed first industrializing nation—and the US, a country whose political and geographical conditions differed so sharply from European countries. City planning in England between 1850 and 1900, for example, was discussed as a model for state-planned construction of living quarters, promotion of public health, and promotion of workers' welfare in periods of heavy industrialization.²⁵ A related study by the architect Hugo Koch on horticulture, art, and urban planning, was reviewed positively in the VDDI's periodical and recommended among others to directors of municipal administrations. The reviewer points out in particular the relevance of green spaces in towns for exercise and education of male youth.²⁶ Koch's study is based on journeys he undertook to “park-politically outstanding” cities in the US and England. It emphasizes the intimate cooperation of architecture, horticulture, and urban development.²⁷ Koch describes particularly well the tensions between traditional, pre-industrial village structures, and industrial construction and production in the modern age. He cites from the pamphlet of a lobby group for *Heimatschutz*, which says that those gifted with a sense for the pictorial and the quaint must have noticed the recent massive change in towns, villages, meadows, and valleys: ancient corners have disappeared, urban expansion has been planned at the drawing board without adaptation to the terrain and consideration for aesthetics, landscapes have been eaten up by real estate speculation, and, in the countryside, farming villages with half-timbered houses have been urbanized according to cut and dried templates. Such people, the pamphlet claims, must feel that “the Germany of our singers and poets” is being sacrificed for technological progress.²⁸

One more short notice in the VDDI's periodical, just before the War, connects the issue of *Heimatschutz* fundamentally to the bureaucratic and political structure of the German Empire, the state, its administration, its representatives and their meetings, and educational projects. Under “Announcements,” in 1912, a notice says that a committee was created in Berlin, the *Ausschuss für Bauberatungsstellen* (Committee for Outreach

24 Hiller, “Pseudoarchitektur und Ingenieurästhetik. Zum Neubau der alten Mainbrücke in Frankfurt a. M.” and Schwenke, “Buchbesprechung.” The engineer Hiller holds that the new bridge over the river Main is an urgent urban planning question for Frankfurt, in which principles of *Heimatschutz* are most adversarial to principles of modern life supported by rational technology (77). The book review by the engineer Schwenke explains, on the basis of the redesign of Old Brussels and the construction of the new central train station, how old, narrow, and unhealthily built neighborhoods were removed to create broad, functional streets that fulfill all modern standards of traffic, hygiene, and aesthetics (104).

25 “Gartenstädte und Arbeiterfürsorge in England,” Z-VDDI 4 (1913), 267.

26 *Technik & Kultur* 1922, 88-89.

27 Koch, *Gartenkunst im Städtebau*, “Vorwort,” no page number.

28 “[...]als ob das Deutschland unserer Sänger und Dichter [...] geopfert werden mußte [...].” Koch, *Gartenkunst im Städtebau*, 179.

Offices on Planning and Building), by the *Zentralstelle für Volkswohlfahrt* (Central Office for Social Welfare). The newly founded committee met in 1912 with many deputies of the state offices and public authorities present (*Vertreter der Reichs- und Staatsbehörden und städtischer Verwaltungen*), and it was announced that there would be an exhibition, “The German village,” in 1913. The exhibition was meant to raise the profile of *Heimatschutz* and of the *Bauberatungsstellen* (outreach offices for planning) and to demonstrate the beauty of “our” villages and, on the basis of examples and counter-examples, show that their natural design and function could be maintained through the right strategies of *Heimatschutz*.²⁹

29 Z-VDDI 3 (1912), 43.

Another issue related to this was the massive destruction during the Great War at both the eastern and the western fronts. Entire towns and villages were destroyed, for example, in German-occupied Belgium during the first German offensives in the summer of 1914 according to the Schlieffen plan, and when the Russian Empire invaded East Prussia in August and September of 1914.³⁰ Engineers, architects, bureaucrats, and critics alike were aware that enormous amounts of labor and capital would have to be invested in urban development. They were wondering whether the municipal administrations were equipped to tackle this task of unprecedented dimension and size, and execute it according to the state-of-the-art principles of “the modern art of urban construction.” Engineers and architects lobbied for themselves, emphasizing the importance of assigning the right experts to the right projects and the creation of a centralized office. There was wide consensus, in particular during war time, for such technocratic top-down approaches.³¹ Architects and civil engineers were being called upon during the war to apply for senior positions in the reconstruction of East Prussia in a large half-page appeal entitled *Architekten und Bauingenieure für Ostpreußen*, early in the 1915 volume of the VDDI’s periodical. Interested engineers were asked to submit a cover letter and résumé to the main office of the VDDI in Berlin. Only senior engineers were asked to apply, the advertisement said: architects and civil engineers who were well-trained in city planning, and in all aspects of construction and economics.³²

30 Gilbert, *The First World War*, 103-104.

31 Z-VDDI 6 (1915), 89.

32 Z-VDDI 6 (1915), 5.

In close proximity to expressions of such wide-ranging matters of class, social order, humanistic education, construction, and architectural aesthetics, there were also texts in the VDDI’s periodical that reached for intersections of, on the one hand, engineering knowledge and practices, and, on the other, the work of well-known philosophers. Architectural work and aesthetics figured in such texts as well, often, once again, to negotiate the status of regular engineering work (such as mechanical engineering) vis-à-vis broader political and aesthetic questions. Architecture seemed to embrace such questions much more easily than ‘ordinary’ engineering disciplines. I discuss in the final section of my essay one such text in which the patent lawyer and engineer Carl Weihe uses philosophical ideas by Arthur Schopenhauer to explain and validate engineers’ work. I do

not engage, in the context of my present argument, the question of the accuracy or cogency of Weihe's deliberations on Schopenhauer's work, and I also bracket the question of whether his reading of Schopenhauer does justice to Schopenhauer or to Schopenhauer's ideas in the context of the larger history of philosophy. Instead, I take Weihe to be an important and rather specific social actor who was deeply committed to raising the social status of engineers in the contemporary German society and who was also committed to introducing engineers to the work of canonical philosophers.

Philosophy of Technology in Engineers' Class Struggle

In the early twentieth century, individual engineers engaged philosophical texts for a range of reasons, and we can often see in their deliberations the entire spectrum of the intellectual, professional, and social concerns discussed above.³³ We can also identify once again the continuous attention that engineers paid to the status of the humanistically and legally trained civil servants in the state administration, and the ways they emulated these men and, at the same time, rejected them as professional role models.

A patent lawyer named Carl Weihe wrote in 1911 an essay for the VDDI's periodical with the title "Affinities in the ways of thinking between engineers and Arthur Schopenhauer."³⁴ Weihe eventually became the editor of the VDDI's periodical from 1921 to 1928, and he pursued during that time with even more deliberation the twin goals of elevating engineers' status in German society and introducing them to philosophical texts.³⁵ Three aspects of his 1911 essay on Schopenhauer are particularly noteworthy. One of them revolves around architecture, and all three taken together explain why he makes this interesting claim in his essay's title. The text is, first, a subtly patronizing call for engineers to study Schopenhauer's work. Weihe claims repeatedly that his philosophy is fruitful and attractive for any engineer. Second, Weihe advances strong anti-rationalist arguments and maps them onto the contemporary—and for him undesirable—social and professional order of the German civil service and state administration. As part of that, Weihe denies that his reading of Schopenhauer has anything to do with professional rivalries. For a significant part of his philosophical text, he vacillates between being attracted to and repelled by the professional role model of civil servants and rationalist philosophers. Finally, Weihe engages Schopenhauer's ideas on beauty, architecture, and art. The purpose of these comments is, ultimately, to elevate the status of mechanical engineering so that it is on par with architecture and art, and with their authority in matters of beauty and aesthetics.

Weihe says at the outset of his essay that some people will be surprised to hear the name Schopenhauer in connection with the profession of the engineer. He holds that it is the most modern of modern professions, its task being the production of commodities and satisfaction of people's ever

³³ Herf, *Reactionary Modernism*, 157-188; Kline, *Steinmetz: Engineer and Socialist*, 165-236; Hård and Jamison (eds.), *The Intellectual Appropriation of Technology*.

³⁴ Weihe, "Verwandtschaftliches in der Denkweise des Ingenieurs und Arthur Schopenhauers."

³⁵ Dietz, "'Technik und Kultur' zwischen Kaiserreich und Nationalsozialismus," 115-121; and my forthcoming article in *Technology & Culture*, quoted in note 23.

36 "Es ist vor allem die hohe Bewertung der Wirklichkeit, die scharfe Beobachtung des einzelnen, die Erkenntnis der Dinge aus der Anschauung heraus, kurz die Betonung des anschaulichen Denkens gegenüber dem begrifflichen, was in Schopenhauers Schriften für den Ingenieur [...] so anziehend ist (573)."

37 Weihe, "Verwandtschaftliches in der Denkweise des Ingenieurs und Arthur Schopenhauers," 573.

38 "Ist es nicht auch das anschauliche Denken, dessen sich der Ingenieur tagtäglich bei seiner Berufsarbeit bedienen muß? Die zu bauende Maschine steht als Vorstellungsbild in seinem Kopfe, [...] er zeichnet sie in allen Einzelheiten auf das Papier [...] Da helfen ihm keine Worte, Begriffe und logischen Figuren, nur die unmittelbare Anschauung [...] (574)."

39 "[...] köstlich klingt das Gezanke [Schopenhauers], wenn er über den Hegelianismus, den Vertreter der Abstraktion, herzieht. [...] Auch der Ingenieur hat ja täglich mit Abstraktionsmenschen zu kämpfen; der Formalismus, Bürokratismus und Assessorismus, der sich seit langer Zeit in alle unsere Verwaltungen unbemerkt eingeschlichen [...] hat, hemmt und hindert das freie Arbeiten der Technik. [...] Weltfremd sitzt oft genug auch der Richter hinter seiner Schranke, ängstlich bemüht, vor allem die Würde seines Standes zu wahren" (575).

40 "Es fehlt eben in der Verwaltung [...] [und] Rechtsprechung das anschauliche, vorstellende, die Dinge der Welt wirklich erfassende [...] Denken [...], ohne welches unsere moderne Kultur [...] nicht [...] verstanden werden kann. Das abstrahierende Denken, das nur mit Worten und nicht mit Bildern operiert, reicht hierzu nicht aus, und somit kann auch die Alleinherrschaft des lediglich juristisch, d. h. abstrakt Vorgebildeten auf die Dauer nicht bestehen bleiben. Hier handelt es sich nicht um den Kampf zweier Berufe, sondern um eine mit naturgesetzlicher Notwendigkeit sich vollziehende natürliche Auslese, indem das Unzweckmäßige (Unwirtschaftliche) durch das Zweckmäßige abgelöst wird (575)."

41 "Scharf hat Schopenhauer auch das Wesen der Baukunst erfaßt; die moderne Ingenieurästhetik, die den Zweck in den Vordergrund stellt, stimmt mit ihm vollkommen überein (576)."

growing needs. Weihe reminds the reader that the engineering disciplines build on the natural sciences, which do not believe in metaphysics. How strange, therefore, must a philosopher such as Schopenhauer seem to physics: Schopenhauer, who not only pursues metaphysics, but claims a fundamental need of man for metaphysical thinking. Still, Weihe holds that he can demonstrate that Schopenhauer's unique ways of thinking, which also set him apart from his contemporaries, display affinities to the ways engineers think. This makes studying Schopenhauer attractive to any engineer, Weihe says, and he repeats this many times in the text.

What matters to engineers in Schopenhauer's work, according to Weihe, is the high valuation of reality, the sharp observation of detail from one's *Anschauung* (intuition and visual impression), and the emphasis on *das Anschauliche* (the visual, intuitive, immediate, and the concrete)—as opposed to abstract terminology and reasoning.³⁶ He often quotes Schopenhauer directly, for example when Schopenhauer says that "my sentences are not based on reasoning, but immediately on the visual world itself."³⁷ Through Schopenhauer, Weihe criticizes philosophies that use reflection but not intuition.

It is the visual image, Weihe says, that is the basis of the engineer's daily work: building machines, drawing, imagining.³⁸ He also points out that Schopenhauer, like the engineer, uses examples that are drawn from everyday life, unlike the abstract bureaucrat, the judge, or the abstract Hegelian philosopher. Using Schopenhauer's philosophy, Weihe aims to discredit in particular these three types of men.³⁹ The irony is that Weihe uses men of such professions as counterexamples for a proper modern professional identity, while these are precisely the men who successfully held the monopoly on positions that the VDDI so keenly wanted for its constituency. Weihe laments the absence of *vorstellendes Denken* (imaginative thinking) and, again, *Anschauung* (concrete visualizing) in administration as well as in law. Without this thinking, he says, modern culture and its complexity cannot be understood. This is not, he insists, a struggle between two professions. One could argue, however, that what he says reveals precisely his concern that this might be the case: that the supposed dispute on epistemology in engineering and legal administration is, at heart, a struggle between old and new professions. Instead, Weihe claims, emphasis on thinking with images and concrete things is a necessity by the natural law of selection.⁴⁰

It is unsurprising that Weihe also admires, and recommends to engineers, Schopenhauer's understanding of architecture. Weihe claims that modern engineering aesthetics—which foregrounds the purpose—"entirely coincides" with Schopenhauer's thinking.⁴¹ He extensively quotes Schopenhauer directly again in his essay's passages on architecture. Schopenhauer says, according to Weihe, that the form of each part must be determined through its purpose and its relationship to the whole, not

arbitrariness.⁴² Schopenhauer also says that the beauty of architecture can mainly be seen in the outright display of the purposes and their accomplishment in the most natural and fastest manner.⁴³ And Weihe says through Schopenhauer that the actual topic for architecture are the ideas of the most basic natural properties—mass, stiffness, cohesion. Architecture’s actual topic is not—as has been the assumption to date—merely the regular form, proportion, and symmetry. Such matters are purely geometrical, they are properties of space, not ideas; therefore, according to Schopenhauer and Weihe, they cannot be the theme of a fine art.⁴⁴ Finally, Schopenhauer helps Weihe claim for the discipline of mechanical engineering the status of architecture and art. Weihe holds that, if mechanical engineering had already been developed during Schopenhauer’s time, he would have constituted the same principles for mechanical engineering as he constituted for architecture.⁴⁵ Weihe makes Schopenhauer, in a relentless and adamant way, an ally in his class struggle vis-à-vis bureaucrats, lawyers, and humanistically trained mandarins.

Conclusion

The particular text by the engineer and lawyer Carl Weihe is a specific example for the role that a committed and educated man could claim for himself in the efforts for social emancipation on the part of German engineers and architects in the first two decades of the twentieth century. Weihe’s work is not easily generalized or applied elsewhere: in fact, we know so little about him that biographical and intellectual analyses of his life and work rely entirely on his printed texts and on conjecture based on observations we can make about the effects of his editorship of *Technik & Kultur* in the 1920s.⁴⁶ His work makes explicit, however, the tensions in which technology, engineering, and bourgeois male selfhood found themselves in the industrial machine age, and the tensions were often negotiated through attempts at defining the terms *Kultur*, *Technik*, *Bildung*, und *Bauwerk*. The ways in which Weihe wrestles with Schopenhauer’s work, translating it for engineers and mapping it onto engineers’ work, has a social and institutional equivalent in the 1900, ‘10s, and ‘20s in the lobby and campaign work of the groups and associations that engineers and architects had founded, to make their voices be heard in the young and thriving machine age. Engineers were under the impression that “their” machine age was being run by pre-industrial elites and non-technical experts. Architectural work and practices provided bridges between, on the one hand, such traditional engineering disciplines as mining and mechanical engineering, and, on the other, reflection on art and politics. At the level of institutional organization and lobbying, engineers and architects often found themselves in the same boat up against a large group of elites and political experts who considered them to be interlopers or parvenus. According to sociologists, the emancipation of engineers was still not completed even much later in the twentieth century: but there was a continuing interest, against consid-

42 “Die Gestalt jedes Teiles muß bestimmt sein durch seinen Zweck und sein Verhältnis zum Ganzen, nicht durch Willkür.” (576)”

43 “Die Schönheit der Baukunst sehen wir hauptsächlich aus der unverhohlenen Darlegung der Zwecke und dem Erreichen derselben auf dem kürzesten und natürlichsten Wege hervorgehen’ (576).”

44 “Für die Architektur sind die Ideen der untersten Naturstufen, als Schwere, Starrheit, Kohäsion, das eigentliche Thema; nicht aber wie man bisher annahm, bloß die regelmäßige Form, Proportion und Symmetrie, als welche ein rein Geometrisches, Eigenschaften des Raumes, nicht Ideen sind, und daher nicht das Thema einer schönen Kunst sein können’(576).”

45 “Wäre der Maschinenbau zu Schopenhauers Zeit schon entwickelt gewesen, der Philosoph hätte sicherlich für ihn dieselben Grundsätze [wie für die Baukunst] aufgestellt” (576).

46 Dietz, “Technik und Kultur’ zwischen Kaiserreich und Nationalsozialismus.” I thank Berhard Dietz for conversations about the unknown figure Carl Weihe. See also Voskuhl, “Philosophy for Engineers: Class Struggle, Theories of Technology, and German Idealism in High-Industrial Germany,” under review with *Technology & Culture* (see note 23).

erable resistance, to formulate philosophical and cultural theories of technology in regard to both engineering and architectural work.

Author

Adelheid Voskuhl teaches the history of technology in the Department of History and Sociology of Science at the University of Pennsylvania. She received her PhD from the Department of Science and Technology Studies at Cornell University and taught after that at the Department of the History of Science at Harvard University. Her first book, *Androids in the Enlightenment: Mechanics, Artisans, and Cultures of the Self* (University of Chicago Press, 2013) received the 2014 Jacques Barzun Prize in Cultural History. Her larger interests include the philosophy of technology, modern intellectual history, and theories of media and textuality. She is currently working on a book manuscript on the role of the philosophy of technology in engineers' efforts to constitute themselves as a new professional group during the Second Industrial Revolution.

Literature

Barnhart, Robert K. The Barnhart Dictionary of Etymology. Bronx, N.Y.: H.W. Wilson Co., 1988.

Bernstein, Susan. "Goethe's Architectonic Bildung and Buildings in Classical Weimar." *Modern Language Notes*. Vol. 114, No. 5, (1999), 1014-1036.

Brose, Eric Dorn. The Politics of Technological Change in Prussia: out of the Shadow of Antiquity, 1809-1848. Princeton, N.J.: Princeton University Press, 1993.

De Groot, Gerard J. The First World War. Hampshire; New York : Palgrave, 2000.

Dietz, Burkhard. "Technik und Kultur' zwischen Kaiserreich und Nationalsozialismus. Über das sozio-kulturelle Profil der 'Zeitschrift des Verbandes deutscher Diplom-Ingenieure' (1910-1941)," in *Technische Intelligenz und "Kulturfaktor Technik": Kulturvorstellungen von Technikern und Ingenieuren zwischen Kaiserreich und früher Bundesrepublik Deutschland*, ed. by B. Dietz et al., Münster; New York: Waxmann, 1996, 105-132.

Duden: Herkunftswörterbuch, Etymologie der deutschen Sprache. Mannheim: Dudenverlag, 2001.

Fraunholz, Uwe, Thomas Hänseroth, and Anke Woschech. "Hochmoderne Visionen und Utopien. Zur Transzendenz technisierter Fortschrittserwartungen," in Uwe Fraunholz, Anke Woschech (eds.), *Technology Fiction: Technische Visionen und Utopien in der Hochmoderne*, Bielefeld: transcript 2012, 11-24.

Gilbert, Martin. The First World War: A Complete History. New York: H. Holt, 1994.

Gispén, Kees. New Profession, Old Order: Engineers and German Society, 1815-1914. Cambridge, UK; New York: Cambridge University Press, 1989.

Goethes Werke. Hamburg: C. Wegner, 1949-1960, vol. 12.

Goethe, Johann Wolfgang von. "On German Architecture," in *Essays on Art and Literature*. Translated by Ellen von Nardroff and Ernest H. von Nardroff. New York, NY: Suhrkamp Publishers New York, 1986, 3-10.

Hård, Mikael. "German Regulation: The Integration of Modern Technology into National Culture," in Hård and Jamison (eds.), *The Intellectual Appropriation of Technology: Discourses on Modernity, 1900-1939*. Cambridge, Mass.: MIT Press, 1998, 36-44.

Hård, Mikael and Andrew Jamison. "Conceptual Framework: Technology debates as Appropriation Processes," in Hård and Jamison (eds.), *The Intellectual Appropriation of Technology: Discourses on Modernity, 1900-1939*. Cambridge, Mass.: MIT Press, 1998, 1-15.

Herf, Jeffrey. *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich*. Cambridge, UK: Cambridge University Press, 1984.

Hiller, Ernst. "Pseudoarchitektur und Ingenieurästhetik. Zum Neubau der alten Mainbrücke in Frankfurt a. M.," *Zeitschrift des Verbandes Deutscher Diplom-Ingenieure* 6 (1915), 77-78.

Hortleder, Gerd. *Das Gesellschaftsbild des Ingenieurs. Zum politischen Verhalten der Technischen Intelligenz in Deutschland*. Frankfurt: Suhrkamp Verlag, 1970.

Jarausch, Konrad Hugo. *The Unfree Professions: German Lawyers, Teachers, and Engineers, 1900-1950*. New York: Oxford University Press, 1990.

Jarausch, Konrad Hugo. "The German Professions in History and Theory," in Geoffrey Cocks, Konrad H. Jarausch (eds.), *German Professions, 1800-1950*. New York/Oxford: Oxford University Press, 1990, 9-24.

Kaelble, Hartmut. "The French and German Bourgeoisie 1870-1914," in Kocka, Mitchell (eds.) *Bourgeois Society in Nineteenth-Century Europe*, Oxford/Providence: Berg Publishers, 1993, 273-301.

Kaiser, Walter und Wolfgang König (eds.). *Geschichte des Ingenieurs. Ein Beruf in sechs Jahrtausenden*. München: Carl Hanser, 2006, 1.

Kline, Ronald R. *Steinmetz: Engineer and Socialist*. Baltimore: Johns Hopkins University Press, 1992.

Koch, Hugo. *Gartenkunst im Städtebau*. Berlin, Wasmuth, 1914.

Kocka, Jürgen. "The European Pattern and the German Case," in Jürgen Kocka and Alan Mitchell, eds. *Bourgeois Society in Nineteenth-Century Europe*, Oxford; Providence: Berg, 1993, 3-39.

Mücke, Dorothea E. von. "Beyond the Paradigm of Representation: Goethe on Architecture." *Grey Room* 2009, 35, 6-27.

Purdy, Daniel L. *On the Ruins of Babel: Architectural Metaphor in German Thought*. Ithaca: Cornell University, 2011.

- Rostow, W. W.* The Stages of Economic Growth: A Non-Communist Manifesto. Cambridge: Cambridge University Press, 1960.
- Sander, Tobias.* Die doppelte Defensive: soziale Lage, Mentalitäten und Politik der Ingenieure in Deutschland 1890-1933. Wiesbaden: VS, Verlag für Sozialwissenschaften, 2009
- Schwenke, W.* "Buchbesprechung" (Die Umgestaltung von Alt-Brüssel), *Zeitschrift des Verbandes Deutscher Diplom-Ingenieure* 6 (1915), 104.
- Wehler, Hans-Ulrich.* Deutsche Gesellschaftsgeschichte. Vol. 3, Von der <<Deutschen Doppelrevolution>> bis zum Beginn des Ersten Weltkriegs, 1849–1914. Munich: C. H. Beck, 1987.
- Weihe, Carl.* "Verwandtschaftliches in der Denkweise des Ingenieurs und Arthur Schopenhauers." *Z-VDDI* 2 (1911), 573-577.
- Weihe, Carl and S. Stamm.* "Die Ziele des Verbandes Deutscher Diplom-Ingenieure," *Technik und Kultur* 12 (1921), 146-147.
- Weihe, Carl.* "Braunschweig 1922," *Technik und Kultur* 13 (1922), 202-203.
- Weihe, Carl.* "Der Verband Deutscher Diplom-Ingenieure," *Technik und Kultur* 15 (1924), 10-12.
- Wickop, Georg G.* Die technischen Hochschulen und ihre zukünftigen Aufgaben in den Fragen der staatsbürgerlichen und künstlerischen Erziehung. Darmstadt: Bergsträsser, 1912.
- Willeke, Stefan.* Die Technokratiebewegung in Nordamerika und Deutschland zwischen den Weltkriegen: eine vergleichende Analyse. Frankfurt am Main; New York: P. Lang, 1995.

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