



## NATIONAL ENDOWMENT FOR THE HUMANITIES

DIVISION OF RESEARCH PROGRAMS

### **Narrative Section of a Successful Application**

The attached document contains the grant narrative and selected portions of a previously funded grant application. It is not intended to serve as a model, but to give you a sense of how a successful application may be crafted. Every successful application is different, and each applicant is urged to prepare a proposal that reflects its unique project and aspirations. Prospective applicants should consult the Research Programs application guidelines at <https://www.neh.gov/grants/research/fellowships> for instructions.

Note: The attachment only contains the grant narrative and selected portions, not the entire funded application. In addition, certain portions may have been redacted to protect the privacy interests of an individual and/or to protect confidential commercial and financial information and/or to protect copyrighted materials.

Project Title: Materialized: The Global Life of Steel

Institution: University of Rochester

Project Director: Peter Christensen

Grant Program: Fellowships

## **RESEARCH AND CONTRIBUTION**

I seek an NEH Fellowship to work on my second major book project, tentatively titled *Materialized: The Global Life of Steel*. I begin by exploring how the dawn of Modernity is celebrated as a period of radical change for architecture and formal possibilities. Too often, however, the materials that were used to make Modern architecture have been subsumed under the more entrenched rubrics of form, function, and cultural meaning. Steel, introduced into architecture on a broad scale during the nineteenth century, did indeed have a radical impact on architecture, forever changing the way we perceive and inhabit buildings. But it also produced a radical new ecology, one that reflected a parasitic and cyclical new relationship with the environment and natural resource. *Materialized* illustrates that as architects and engineers sought to harness steel’s incredible capacities in order to transform architecture, steel itself simultaneously transformed the natural world. The book explores the ecological interrelationship mediated by steel between these artificial and natural habitats through a focus on the earlier portion of steel’s history in architecture during the long nineteenth century and through the central prism of the corporate history of Krupp and Thyssen, arguably the most influential steel manufacturers of their day. The book’s method, a close analysis of a material’s ecology on the one hand, and architecture on the other, proposes an innovative way to understand the power of a material to shape the historical and global world.

Building materials are as much a part of a building as they are a part of the natural world, and architectural history has begun to grapple with this as part of its reckoning with what is known as the Anthropocene era. *Materialized* explores a material that is essential to Modern architecture—not expressly for the heroic innovations it facilitated, but rather for a deeper understanding of the ecology of steel and the role it played in the steady change of the earth in the Modern period. My book’s ecological approach, which traces steel through six distinct phases of its life cycle: birth, formation, display, dispersal, construction, and return, is reinforced by a trend in contemporary scholarship towards decentering the human in architectural history. By following the life of steel from the collection of raw minerals and metals to the distribution and disposal of finished products, *Materialized* challenges the traditional narrative that architectural steel was the primary material responsible for architectural Modernism.

The book achieves this revisionist interpretation by combining the methods of environmental history, which focus on ecology and the macro scale, with localized sources of business and trade history, especially corporate archives. Because I am a specialist on modern Germany, the book’s documentary center of gravity features the titans of the German steel industry during the late nineteenth century: Krupp and Thyssen. However, the book has a global scope - as I examine the macro and international implications of the steel industry in Germany, I also interweave an analysis with substantive, comparative material from France, Turkey, England, and the United States. I focus on the long nineteenth century in an effort to explore the architectural steel economy’s most formative years, a period that predates a complete understanding of the ecological impact of the Industrial Revolution. In addition to tracing how architectural steel afforded Germany’s leading industrial corporations a new type of political power, I also explore the ways in which environmental and architectural history can serve as lenses for understanding how steel, as a material form, facilitated a dynamism of meaning that economic and political power, as abstract concepts, could not achieve.

The histories of the Krupp and Thyssen steel companies can serve as primers on the history of the German state: an entity that emerged from a regional culture centered on crafts and interregional trade to become an industrial and military powerhouse with immense political capital. As with Bethlehem Steel and, later, Ford in the United States, Peugeot in France, and Mitsubishi in Japan, the confluence of corporate, industrial, and national history found at Krupp and Thyssen’s headquarters in the Ruhrgebiet is stunning in how it marks the corporation as a microcosm of the nation and its economy. This microcosm of German power has attracted a fair share of scholarship, particularly Marxist interpretations, but the Marxist framework has also limited the scholarly cone of vision to the analogic dyad of corporation and nation. My book moves beyond this dyad and the fields of economic and political history by exploring the role of steel in a global context through the lenses of architectural and environmental history, two fields that are absent in the scholarship on these entities.

**Chapter 1** explores the birth of steel in architecture by examining the mining of coal and iron ore for steel production, the metallurgical research behind steel, and the processes of environmental degradation and displacement it entailed. For example, Krupp’s mining operations are most associated with the mines in their own backyard, the Ruhr Valley. Less well known are the significant operations Krupp conducted

in Spain, a major focus of this chapter. These include Krupp's entanglements with the Orconera Iron Company in Bilbao, the Maquinista Terrestre y Maritima in Barcelona, and the Eschevarita shipyard in Cadiz. I examine how, at these mining sites, as well as those of Krupp's associates in Spain, the company exercised a certain localized control by engineering and denuding Spain's natural environment and in turn exacting a precise form of pressure upon the Kingdom of Spain. Turning to the production process itself, I look at the vast and understudied importance of slag as an industrial byproduct. In the late nineteenth century, engineers discovered the usefulness of slag in the production of asphalt, which led to a boom in the paving and production of roads in Germany and ultimately, beyond. The process of enhancing and improving the road system in Germany served a symbiotic function in industrialization, with each helping the other to spread.

**Chapter 2** turns to the corporate headquarters and examines the cultural dynamics and local labor forces that guided the formation of steel—in particular, the I-beam—as a commodity. The I-beam, a permutation of a railway gauge, had a structural capacity credited with reducing the density of columnar configurations in modern architecture and freeing up the floor plan, all the while allowing for “skin” cladding such as the glass curtain wall. The paradigm shift afforded by the I-beam is also well known in the history of infrastructure, where it proved particularly critical in the construction of bridges and railway lines. This new industrial-scale production of the I-beam also necessitated new forms of labor. Krupp, for example, was one of the first companies to attract migrant workers from across Europe, and they were housed in carefully designed homes and planned communities. Here I examine the interrelationship of the I-beam with the company's architectural and urban visions in the Altenhof, Alfredshof, and Margaretenhöhe settlements, exploring how architects and designers like Alois Meyer, Robert Schmohl, and Gustav Krämer engineered Krupp's domestic as well as industrial environs to be places emphasizing a German *Heimat* (homeland) rather than an international, industrial culture. Like mining, this project had an environmental objective; in and around Essen, the objective was to create a German idyll, an antidote of sorts to the degradation of another environment elsewhere.

**Chapter 3** examines how the emerging industry of architectural steel took its show on the road and economically internationalized itself through cultural venues, putting steel on display for audiences at expositions and trade fairs. Exhibitions of structural steel building components such as I-beams, T-beams, and steel decks, as well as their interrelationships, intimated a logic of prefabrication and usability. Two very prominent examples include the Crystal Palace Exhibition in 1851 and the World's Columbian Exposition in Chicago in 1893. In these exhibitions, steel producers went to great lengths to produce impressive exhibits designed to be culturally transposable; hence, offering vivid glimpses into how a corporation posited itself as a producer of goods with translatable cultural value. This chapter wrestles with the tension between the capitalist logic and the cultural cosmopolitanism behind such transposability.

**Chapter 4** traces the markets for and dispersal of architectural steel as these markets gradually internationalized, aided by the expansion of global shipping routes. To illustrate how these markets functioned, this chapter examines the various catalogues produced by Krupp and Thyssen in multiple languages that demonstrate how and why building elements like base trims, girts, angles, channels, rigid frame systems, secondary framing systems, sheeting, panels, I-beams, and T-beams produced a repertoire of architectural components that made steel construction increasingly simple and accessible, particularly in places where steel construction was relatively new. To demonstrate how this system of construction worked, I trace three specific steel orders from Krupp for projects that used these components, including an apartment building in Istanbul, a bridge over the Ganges River, and a brewery in Qingdao.

**Chapter 5** extends the book's themes to the use of steel in bespoke architectural construction. This chapter explores a selection of key sites where raw steel products such as railway gauges and girders were deployed and assembled to create arteries of soft power, like the railways of Venezuela, as well as monuments of an iconoclastic national architecture, such as William Van Alen's Art Deco Chrysler Building in New York City. These case studies demonstrate the mutability, as opposed to the prefabricated nature, of steel as a raw product. They also reveal how these buildings' producers, German manufacturers, chose or chose not to use the economic and political clout of steel to influence how foreign entities or German entities in foreign countries used steel, producing a dynamism of control and creative synthesis on the global stage.

Finally, **Chapter 6** probes the return of steel to nature and into new incarnations by examining the rise of the scrap yard and the origins of structural steel recycling in the nineteenth century. Although steel buildings seldom came down during this period, a handful did, and, more commonly, nonessential steel

parts were often scrapped when updates to buildings were made. This chapter brings the volume full circle, returning to metallurgical science to examine how a new recycling system that mixed scrap steel with iron and oxygen and burned off carbon for purification, along with the advancement of alloy technology, facilitated an entire ecology for the steel industry. Here I make an exception to the chronological scope of the book by examining the extreme proliferation of steel scrap in the wake of World War I, a period that, owing to the destruction across Europe, was something of a boom time for scrap yards and recycling technology. This chapter focuses specifically on three different scrap yards located in Essen and Bochum and how they collaborated to create an afterlife for the scrapped steel.

### **METHODS AND WORK PLAN**

In *Materialized*, I use a method that traces the transformation of materials into objects, a “bean to bar” (and back again) approach, as the main organizational framework for the six chapters. Moving from the acquisition of minerals and metals to the dispersal of finished goods, I elucidate the various ways in which steel companies’ activities abroad both mimicked and diverged from those of the state and the vicissitudes of its particular foreign policy, demonstrating the tactical ways in which a corporation could both leverage and reappropriate imperial power. For example, according to Friedrich Alfred Krupp, who led Krupp during the last quarter of the nineteenth century, steel was to be a harbinger of peace, order, embellishment, and victory. Although my book leaves off where most stories of the company begin—with the industry’s deep connection to National Socialism and its role in arming Germany during World War II—it serves to contextualize this better-known history within the framework of earlier events.

While telling a specific historical story *Materialized* also examines theoretical, phenomenological, and technological aspects of materiality in architecture. My book moves beyond the aphorism that the architecture of the Modern period was conceived largely on the basis of the invention of new materials and enhanced performance of the old ones. It promotes materiality not as an issue of inert matter, but rather as an active agent in the construction of architecture. *Materialized* highlights a number of primary textual sources to give “voice” to steel as a material through the treatises and scholarly reports of metallurgists and engineers, correspondence between bureaucrats, industrialists, shippers, engineers, architects, and workers. The book also examines the microscopic images, mine plans, architectural drawings, exhibition designs, and visual documentation that show the evolution of ideas behind steel’s manufacture and employment. This dual focus on textual and physical material is vital for understanding steel as something more than the physical evidence of a monolithic political and economic encounter, namely, as a dialogic and bilateral milieu between often distant places and then different realms (the ecological and the architectural).

I am writing this book following archival fieldwork I conducted during AY2016–17 as a fellow at the Humanities Center at the University of Rochester and the Forum Transregionale Studien in Berlin. During this period, I visited over twenty archives in five countries that fall into roughly three categories: corporate archives, archives of state cultural entities, and archives relating to state foreign policy. I have recently begun to transform this massive amount of raw research material into a written narrative.

### **COMPETENCIES, SKILLS, AND ACCESS**

I have a strong record of writing productivity, having completed one book and edited five additional volumes (one forthcoming) in the past decade. I have the necessary languages for this project: German, French, English, Spanish, and Turkish. These language skills have enabled me to carry out geographically expansive archival research for this book and also to conduct the necessary translation work. There are no access issues with this project; with the support of an NEH Fellowship, I envision an uninterrupted year of writing at my home institution, and anticipate completing the manuscript.

### **FINAL PRODUCT AND DISSEMINATION**

The final product is a book. Princeton University Press has already expressed interest in the manuscript. I foresee two primary markets for *Materialized*, which will be a landmark study of steel in architecture and the historical relationship of ecology and architecture: first, and foremost, scholars, graduate students, and advanced undergraduate students studying architectural, environmental, urban, and cultural history for whom it might be used as a supplemental text; and second, architects and engineers working with steel who wish to better understand its historical context.

## **Bibliography**

### Archival Sites:

Archives of Rio Tinto, London; Archivo General de la Nación de Venezuela, Caracas; Archivo Histórico Nacional, Madrid; Auswärtiges Amt, Berlin; Başbakanlık Osmanlı Arşivi, Istanbul; Bundesarchiv, Berlin; Deutsche Bank’s Historisches Institut, Frankfurt; Deutsches Museum, Munich; Geheimes Staatsarchiv Preußischer Kulturbesitz, Berlin; Haus-, Hof- und Staatsarchiv, Österreichisches Staatsarchiv, Vienna; Hausarchiv des Bankhauses Sal. Oppenheim jr. & Cie., Cologne, Max Freiherr von Oppenheim-Stiftung, Cologne; Library of Congress, Washington, DC; Ministère des Affaires Étrangères, Paris; National Archives of the United Kingdom, London; New York Public Library, New York; Österreichisches Staatsarchiv, Vienna; Ruhr Museum, Essen; Staatsbibliothek zu Berlin, Berlin; Stadtarchiv, Essen; Universitätsarchiv, Duisburg-Essen; Victoria and Albert Museum, London.

### Print Literature:

- Berdrow, Wilhelm, and E. W. Dickes (eds.), *The Letters of Alfred Krupp, 1826–1887* (London: Victor Gollancz, 1930).
- Blackbourn, David, *The Conquest of Nature* (New York: W. W. Norton, 2006).
- Bolz, Cedric, “Constructing ‘Heimat’ in the Ruhr Valley: Krupp Housing and the Search for the Ideal German Home 1914–1931,” *German Studies Review* 34:1 (2011), 17–43.
- Brantz, Dorothee, “Forum: The Nature of German Environmental History,” *German History* 27 (2009): 113–130.
- Conrad, Sebastian, *German Colonialism: A Short History* (Cambridge and New York: Cambridge University Press, 2012).
- \_\_\_\_\_, *Globalisierung und Nation im Deutschen Kaiserreich* (Munich: C.H. Beck, 2010).
- Epkenhans, Michael, *Friedrich Alfred Krupp: ein Unternehmer im Kaiserreich* (Munich: C.H. Beck, 2010).
- Gussstahlfabrik Fried. Krupp, *A Century’s History of the Krupp Works, 1812–1912* (Essen-Ruhr: Krupp, 1912).
- Herwig, Holger, *Germany’s Vision of Empire in Venezuela, 1871–1914* (Princeton, NJ: Princeton University Press, 1986).
- Honhart, Michael, “Company Housing as Urban Planning in Germany, 1870–1940,” *Central European History* 23:1 (1990), 3–21.
- James, Harold, Karl-Heinz Siber (trans.), *Krupp: Deutsche Legende und globales Unternehmen* (Munich: C.H. Beck, 2011).
- Kirby, William, *Germany and Republican China* (Palo Alto: Stanford University Press, 1984).
- Loscertales, Javier, *Deutsche Investitionen in Spanien 1870–1920* (Stuttgart: Franz Steiner Verlag, 2002).
- Lüdtke, Alf, “Writing Time—Using Space: The Notebook of a Worker at Krupp’s Steel Mill and Manufacturing—an Example from the 1920s,” *Historical Social Research / Historische Sozialforschung* 38:3 (2013), 216–228.
- Lynch, Martin, *Mining in World History* (London: Reaktion Books, 2002).
- Manchester, William, *The Arms of Krupp, 1587–1968* (Boston: Little Brown, 1968).
- Metz, Friedrich, “Der Bergbau und seine Bedeutung für die Ausbreitung des Deutschtums,” *Geographische Zeitschrift* 35:3 (1929), 131–149.
- Schoonover, Thomas, *Germany in Central America: Competitive Imperialism, 1821–1929* (Tuscaloosa: University of Alabama, 1998).
- Tenfelde, Klaus (ed.), *Pictures of Krupp: Photography and History in the Industrial Age* (London: Philip Wilson, 2006).
- Türk, Fahri, “Deutsche Siedlungspläne im Osmanischen Reich,” *German Studies Review* 33:3 (2010), 641–656.