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Fabricating Modern Societies

Education, Bodies, and Minds in the Age of Steel

Edited by

Karin Priem and Frederik Herman

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To Frank Simon

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Acknowledgments

This volume has emerged from two research projects at the University of Luxembourg entitled "Fabricating Modern Societies: Industries of Reform as Educational Responses to Societal Challenges" (FAMOSO and FAMOSO 2) and funded by the Luxembourg National Research Fund (FNR). Its chapters result from a symposium organized by Karin Priem at the 38th International Standing Conference for the History of Education (ISCHE), which took place in Chicago in August 2016.

The idea for the FAMOSO projects originated in May 2010 during a lively and inspiring conversation with Jean Back, then director of the Luxembourg Centre national de l'audiovisuel (CNA), Luxembourg's national public institution for the conservation and promotion of the country's audio-visual heritage. Back introduced Karin Priem, the principal investigator of the FAMOSO projects, to a huge holding of some 2,400 glass plate negatives and positives related to the Luxembourg steel company Aciéries réunies de Burbach-Eich-Dudelange (ARBED), a significant global player in the twentieth-century steel and iron business and Luxembourg's main driver of social, cultural, and economic change. The glass plates offered a vivid glimpse into the industrial cosmos created by ARBED during the first half of the twentieth century, displaying the company's production site in Dommeldange, its impressively varied products, from huge iron and steel constructions to everyday products, its social and educational initiatives, as well as its workers, engineers, founders, and leaders. This archival holding raised further questions and encouraged research on the multifaceted history of ARBED, its national, European, and global outreach, and its promotion of modern thought styles, also in view of far-reaching social, cultural, and economic transformations inside and outside of Luxembourg. Besides Jean Back, the main inspiration for the FAMOSO projects came from Germaine Goetzinger, the honorary director of the Centre national de littérature (CNL) in Mersch, Luxembourg, who introduced Karin Priem to some key intellectual networks at the time, such as the Décades de Pontigny, the Colpach circle, and the Union de la vérité of Paul Desjardins. These networks were important avant-garde discussion forums for Luxembourg's industrialists and their families who were eager to create their own new role models in the era of industrialization and develop modern cultural, societal, and socio-educational reforms.

The first steps in the design of the FAMOSO projects date back to 2011 and were much stimulated by a booklet entitled *Œuvres sociales*. Published by ARBED in 1922, the booklet gave insight into the wide range of the industrialists' paternalistic and philanthrocapitalist initiatives, which were not only a response to

emerging social unrest but also to the economic interdependencies between workers and industrialists. Industrialists were eager to engineer a stable society in times of rapid industrialization and implement a wide range of technologies of identity formation in the "machine age." An important initial step in the development of the FAMOSO projects was the discovery that some of the glass plates of the CNA holding were reproduced in *Œuvres sociales*, thus revealing strong links to technologies of image reproduction as well as the industrialists' desire to document and promote their social and educational interventions and to establish meaning, purpose, and moral superiority through their actions. Retrospectively, this at first sight rather simple discovery of a connection between an illustrated ARBED publication and the images archived at the CNA was a key element in the development of the FAMOSO projects. It showed the importance of visual technologies and the role of images as reproducible and mobile objects in promoting the company's achievements, also beyond the economic sphere. Indeed, project members soon discovered more visual material—films, photograph albums, posters, corporate brochures, popular magazines, and postcards—that subtly attuned the public to emerging industrial landscapes, modes of production, and new lifestyles and thus helped shape both ARBED's corporate and Luxembourg's national identity.

Launched in 2013 and 2014 respectively, the two FAMOSO projects initially focused on the entanglements between industrialization and the cultural, economic, and social transformations in Luxembourg and beyond. Over time, the initial project design and goals were expanded, as team members introduced new ideas, found their own approaches originating from different academic disciplines, and discovered new rich and previously unexplored source materials—for instance, in private archives inside and outside of Luxembourg. As a result, this multi-dimensional and interdisciplinary collection of essays moves away from and beyond traditional social histories of industrialization, hagiographies of industrial entrepreneurship, labor history, social work, social welfare, social hygiene, and comparative European histories of social and educational reform movements. Instead, it elaborates and expands on the sociocultural and material histories of a wide range of technologies of modernity with various consequences for Luxembourg and other societies at the turn of the twentieth century.

The FAMOSO projects achieved their final shape and structure as a result of many interdisciplinary conversations and discussions with and among current and former project members and international colleagues who have supported the projects and/or have acted as 'critical friends': Regula Bürgi, Cathy Burke, Klaus Dittrich, Irma Hadzalic, Robert Hariman, Martin Loiperdinger, Enric Novella, Ira Plein, Françoise Poos, Siân L. Roberts, Frank Simon, Andreas

Tacke, Geert Thyssen, and Daniel Tröhler. Geert Thyssen in particular offered much support in discussing the original project design. The FAMOSO team is particularly obliged to the staffs of the Centre national de l'audiovisuel, the Bibliothèque nationale de Luxembourg (BnL), the Archives nationales de Luxembourg (ANLux), the Photothèque, and the Centre national de littérature. Thanks are also due to the colleagues at the Institute of Education and Society (InES) and the Luxembourg Centre for Contemporary and Digital History (C^2DH) for their support and many fruitful discussions. Additionally, we owe a debt of gratitude to the reviewers who gave us advice on how to improve our work. Finally, we are greatly indebted to Manuela Thurner for her editorial revisions.

Karin Priem and Frederik Herman
Belval, 2019

Figures

Abbreviations

ANLux	Archives nationales de Luxembourg (Luxembourg National Archives)
ARBED	Aciéries réunies de Burbach-Eich-Dudelange
BnL	Bibliothèque nationale de Luxembourg (Luxembourg National Library)
C²DH	Luxembourg Centre for Contemporary and Digital History, University of Luxembourg
CNA	Centre national de l'audiovisuel (National Audiovisual Center)
CNL	Centre national de littérature (National Literature Center)
FAMOSO	"Fabricating Modern Societies: Industries of Reform as Educational Responses to Societal Challenges" (Parts 1 and 2)
FNR	Fonds National de la Recherche (Luxembourg National Research Fund)
IEM	Institut Emile Metz
InES	Institute of Education and Society, University of Luxembourg
ISCHE	International Standing Conference for the History of Education

Contributors

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Françoise Poos
is an independent researcher and curator. She holds a PhD in visual culture, and she investigates the areas of photography, archives, memory, and identity. She has been working on the FAMOSO project (Part 2) from 2014 until 2017, focusing on an archive of glass plate negatives and positives documenting the steel industry in Luxembourg and its corporate welfare institutions in the first half of the twentieth century. Her research resulted in the exhibition *La Forge d'une société moderne: Photographie et communication d'entreprise à l'ère de l'industrialisation* (*ARBED, 1911–1937*)*/Forging a Modern Society: Photography and Corporate Communication in the Industrial Age* (*ARBED, 1911–1937*) (Centre national de l'audiovisuel [CNA], June–December 2017), which she co-curated with Marguy Conzémius from the CNA, the partnering cultural institution of the FAMOSO projects, as well as in a publication of the same title, which she co-edited with Marguy Conzémius and Karin Priem.

Karin Priem
is associate professor of history of education and head of public history at the Luxembourg Centre for Contemporary and Digital History (C^2DH) at the University of Luxembourg. A former president of the German History of Education Research Association (2007–2011), she is currently president of the International Standing Conference for the History of Education (ISCHE). Karin Priem's research focuses on visual and material history; the history of technology; the European history of humanitarian organizations; and the history of entrepreneurship and social-educational reform. She is editor of the book series *Public History from European Perspectives* and co-editor of the book series *Beiträge zur Historischen Bildungsforschung* and *Appearances: Studies in Visual Research*. Karin also serves as a member of the international scientific board of *Pedagogia Oggi* and the international advisory board of *Paedagogica Historica*. Karin Priem was principal investigator of the third-party-funded FAMOSO projects investigating the industrial heritage of Luxembourg.

Angelo Van Gorp
is professor of history of education at the University of Koblenz-Landau, Campus Landau, Germany. By using historical perspectives and methods, his research examines breaks and continuities in the relationships between educational practices and science, and between schools and communities in the period from the late nineteenth to the early twenty-first century. Current lines of scholarship focus on histories of progressive schooling and on the visual representation of schooling and education in documentary film and photography. Special attention goes to processes of appropriation and contexts of migration and race, urbanity, diversity, and poverty.

Introduction

Karin Priem and Frederik Herman

Where did all the vapour and the noise in Dante's 'Inferno' come from? | He saw and heard it all in Lardorello – | or at least that's what's the local museum in the Italian village of Lardorello claims. | Located in the middle of a geothermal valley, named the Devil's Valley in Tuscany … | Lardorello takes pride in being "the closest thing to Hell on Earth." | What did Dante hear in Lardorello? | Fffffffffffu-marole | Sssssssssssssso-fffffffioni | Mmmmmmo-ffffffette | In March 1911, audiences watching the film 'L'Inferno' did not know … | the actual sounds resonating at the place that inspired Dante. | Very few people knew at the time that in the Devil's Valley a technological revolution had started. | A scientific experiment had been conducted there. | Steam erupting from the earth was used for the first time to generate electricity. | A new industry of geothermal energy production was being born … | a gigantic network of pipes was constructed transporting hot steam … | directly from the guts of the earth to a power plant. | It was a pipe organ of geological proportions. | Hot vapour rushed through each pipe whistling and humming. | The entire landscape was tuned to the noises of new industry. | This was the voice of invisible energy production and industrial capitalism. | This industrial music was not simply new music being composed. | This music was composing a new world. | A dance for factory workers, machines and Hell. | Listen. | If for Dante the geological sounds of the Devil's Valley inspired his Hell … | the continuous noise we hear across the same valley now is an interface … | between geology and industry … | physics and metaphysics | work and devotional labour. | Listen. | The sonic strata of the real and the imagined … | are still composing the soundtrack of L'Inferno. | Listen closely.[1]

1 This quote is taken from an audio-visual installation entitled *102 Years Out of Synch* by the Greek video, sound, and performance artist Mikhail Karikis (born in 1975). The artist retraces the historical soundscape of Dante's *Inferno* by visiting the site of the first Italian geothermal power plant in Tuscany. The installation was part of a solo exhibition of the artist at the CASINO Luxembourg – Forum d'art contemporain in Luxembourg City from July 1 through October 15, 2017.

1 The Dawn of a Mechanized Future

This book deals with the period of industrial revolution in Luxembourg at the turn of the nineteenth to the twentieth century. Starting in the 1880s, the young nation underwent a rapid and massive industrialization process driven by its booming mining and metallurgical industry.[2] In Luxembourg, as elsewhere in the West, the dawn of the "machine age," or the "age of steel," and its associated transformations quickly evoked a wide range of strong and occasionally very opinionated statements, feelings, and emotions.[3] People felt overwhelmed by the massive and tremendous changes everywhere around them: the new cult of speed, rhythm, noise, and energy that accompanied the "machine age"; the exciting sensorial landscapes made of steel; the newly engineered land-, water-, air-, and cityscapes;[4] mass production, new media, and the rapid rise of consumerism; migration, urbanization, and globalization; social and demographic shifts; the frantic scientific developments; and the cultural vitality and extraordinary artistic creativity that went along with these transformations. Indeed, the vibrating atmosphere of the "vertigo years"—as Philipp Blom has described the first decades of the twentieth century—was a fertile breeding ground for cultural productions and artistic manifestations and also became a major motif in the arts.[5] Poets, novelists, painters, filmmakers, and photographers captured, depicted, and also (re)mediated not only various feelings of unease, insecurity, and nervousness but also the positive excitement and the hopes that emerged within this new cosmos of modernity.[6] The arts seemed

2 Luxembourg became partly independent with the Treaties of London of 1839 and 1867, but it was only in 1890—with the abolition of the personal union between the Netherlands and Luxembourg (1815–1890)—that it became a fully sovereign nation-state.

3 Albert Renger-Patzsch, *Eisen und Stahl* (Berlin: Hermann Reckendorf, 1931).

4 Walter Benjamin, in his *Passagenwerk* (1927–1940), focused on the Parisian "*passages couverts*" and their iron and glass construction to describe a new feel of urban space and mentality that had already begun to emerge during the nineteenth century; see Walter Benjamin, *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin (Cambridge, MA: Harvard University Press, 2002), 156.

5 Philipp Blom, *The Vertigo Years: Change and Culture in the West, 1900–1914* (London: Phoenix, 2009). See also Philipp Blom, *Alleen de wolken: Cultuur en crisis in het Westen, 1918–1938*, trans. Pon Ruiter and Henny Corver (Amsterdam: De Bezige Bij, 2014).

6 Several contemporary films such as *Ballet Mécanique* (directed by Fernand Léger and Dudley Murphy; France: Synchro-Ciné, 1924), *Metropolis* (directed by Fritz Lang; Germany: UFA, 1927), and *Man with a Movie Camera* (directed by Dziga Vertov; Soviet Union: VUFKU, 1929) capture the fascination exerted by machinery and the rapid development of technology as well as the fear of an uncontrollable invasion of autonomous machines. See also Blom, *The Vertigo Years*; Blom, *Alleen de wolken*; Lewis W. Hine, *Men at Work: Photographic Studies of Modern Men and Machines* (1932; New York: Dover, 1977).

an appropriate and attractive tool to crystallize and raise awareness of both the possibilities and ills of a mechanized and industrialized civilization. In doing so, artists created "spaces of experience" and "horizons of expectation" against the background of an industrialized and mechanized present and an insecure future.[7]

One side of the spectrum, for instance, is represented by the artistic celebrations of the "machine age" by the international Futurist movement at the beginning of the twentieth century.[8] The following quote from the *Manifesto of Futurism*, written by the Italian poet Filippo Tommaso Marinetti (1876–1944), is a provocative plea to celebrate modernity, break away from the past, and embrace the technological future:

> We will sing of great crowds excited by work, by pleasure, and by riot; we will sing of the multicolored, polyphonic tides of revolution in the modern capitals; we will sing of the vibrant nightly fervor of arsenals and shipyards blazing with violent electric moons; greedy railway stations that devour smoke-plumed serpents; factories hung on clouds by the crooked lines of their smoke; bridges that stride the rivers like giant gymnasts, flashing in the sun with a glitter of knives; adventurous steamers that sniff the horizon; deep-chested locomotives whose wheels paw the

7 Reinhart Koselleck, *The Practice of Conceptual History: Timing History, Spacing Concepts* (Stanford, CA: Stanford University Press, 2002), 126–27. For the Luxembourg context, see, for instance, Jeanne E. Glesener and Frank Wilhelm, "L'image de la sidérurgie dans les romans des Luxembourgeois francophones Joseph Leydenbach, Willy Gilson et Nicolas Ries," in *Terres rouges: Histoire de la sidérurgie luxembourgeoise*, vol. 1, ed. Charles Barthel and Josée Kirps (Luxembourg: Centre d'études et de recherches européennes Robert Schuman/Archives nationales de Luxembourg, 2009), 71–95; Anne-Marie Millim, "Schooling the Gaze: Industry and Nation-Building in Luxembourgish Landscape-Writing, 1900–1940," *Journal of European Studies* 44, no. 2 (2014): 151–69; Frederik Herman and Ira Plein, "Envisioning the Industrial Present: Pathways of Cultural Learning in Luxembourg (1880s–1920s)," *Paedagogica Historica* 53, no. 3 (2017): 268–84; Ira Plein, "'Der tägliche Weg zur Schicht': Aspekte zur proletarischen Kunst Albert Kaisers in der Zwischenkriegszeit," in *100 Joer fräi Gewerkschaften 1916–2016*, ed. Fréderik Krier, Jacques Maas, Arnaud Sauer, and Denis Scuto (Esch-sur-Alzette: OGBL/Éditions Le Phare, 2016), 83–97; Ira Plein, "Beautiful Luxembourg, Steel Works, and a Swimming Pool: The Corporate Film *Columeta* and the Formation of a Corporate, and National, Image," in *Films That Work Harder: The Global Circulations of Industrial Cinema*, ed. Vinzenz Hediger, Florian Hoof, and Yvonne Zimmermann (Amsterdam: Amsterdam University Press, forthcoming); Edmond Thill, ed., *Charles Bernhoeft: Photographe de la Belle Epoque* (Luxembourg: Imprimerie Centrale, 2014).

8 Incidentally, Futurism did not really gain resonance in the arts in Luxembourg, unlike in some other European countries. It could be argued, however, that the Luxembourg industrialists employed the same or at least a similar aesthetic language.

> tracks like the hooves of enormous steel horses bridled by tubing; and the sleek flight of planes whose propellers chatter in the wind like banners and seem to cheer like an enthusiastic crowd.[9]

Using a variety of bombastic metaphors, Marinetti, the founding father of the Futurist movement, welcomed the new technologies and objects, the mechanized environments and societal transformations. For the futurists, the new materials, textures, noises, machines and machine-parts, mass conveyances, and industrial sites were sources of spiritual and artistic inspiration. Indeed, for them, motors and machines did not make noise but were *singing*.[10] The advocates of Futurism wanted to reconcile the arts with the new, the mechanical, the industrial, and the modern. Published in *Broom* (*An International Magazine of the Arts*), both Enrico Prampolini's essay "The Aesthetic of the Machine and Mechanical Introspection in Art" and Paul Strand's photographs of machine-parts (see figs. 0.1 and 0.2) echo the Futurists' ambitions by describing technology, machines, and mechanical elements as "new symbols of aesthetic inspiration" possessing "the marvellous mystery of inspiration."[11]

In his essay, Prampolini (1894–1956), an Italian futurist artist, wrote: "Is not the machine today the most exuberant symbol of the mystery of human creation? Is it not the new mythical deity which weaves the legends and histories of the contemporary human drama? *The Machine* in its practical and material

9 Filippo Tommaso Marinetti, "Foundation and Manifesto of Futurism," trans. R. W. Flint and Arthur A. Coppotelli, in *Marinetti: Selected Writings*, ed. R. W. Flint (London: Seeker and Warburg, 1972), 41–43. "Le Manifeste du futurism" was originally published in French in the February 20, 1909, edition of the Paris newspaper *Le Figaro*.

10 See Luciano Folgore, *Il canto dei motori* (Milan: Edizioni Futuriste di Poesia, 1912). The futurist painter and musical composer Luigi Russolo (1885–1947) was also fascinated by the new industrial soundscape and, in his pamphlet "The Art of Noise" (1913), raised the sounds of industry and the rhythm of the modern machines to the level of art. Russolo developed and constructed several mechanical noise installations to value the new sound and to "enrich … the domain of musical sounds." See Luigi Russolo, "The Art of Noise (Futurist Manifesto, 1913)," trans. Robert Filliou, 11, http://www.artype.de/Sammlung/pdf/russolo_noise.pdf.

11 See Enrico Prampolini, "The Aesthetic of the Machine and Mechanical Introspection in Art," *Broom* 3, no. 3 (1922): 235–37. Paul Strand's photographs were published in the magazine's November 1922 issue, see *Broom* 3, no. 4 (1922): facing 257 and 272. Another example of the aesthetic fascination of iron and steel can be seen in the work of the German photographer Germaine Krull. In 1928, she completed a portfolio entitled "Métal" depicting 64 photographs of iron constructions as monuments of modernity, which were exhibited at the Pinakothek der Moderne in Munich from September 9, 2017, through June 10, 2018; see https://www.pinakothek.de/ausstellungen/germaine-krull-metal.

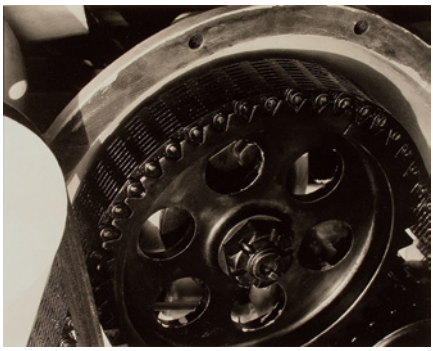

FIGURE 0.1
Paul Strand, *Gears, Akeley Camera Shop*, New York, 1922.

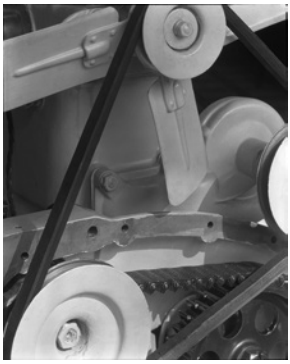

FIGURE 0.2
Paul Strand, *Gear and Fanbelt*, New York, 1921.

function comes to have today in human concepts and thoughts the significance of an ideal and spiritual inspiration."[12]

At the time, modern mechanical apparatuses thus offered a new way to look at, to reflect on, and to think and talk about the world. Indeed, it was a time when the language of mechanization and industrialization was (gradually) applied to the social, economic, medical, and scientific spheres, to individual bodies, society at large, and the universe as a whole, and when there emerged a wide variety of technological metaphors and conceptions such as the human body as a motor or factory, the human being as a gear wheel in the machinery of society, the universe as a machine, bodies that could be molded and restored, and societies that could be manufactured and engineered.[13] The

12 Ibid., 236, italics in the original.

13 The physician Fritz Kahn, a worldwide bestselling author in the 1920s and 1930s, for instance described the human body with the aid of technical metaphors and made several well-known drawings of the human body as a factory, such as the famous diagram

futurists in particular developed a new aesthetic language based on the machine and technological-mechanical elements to showcase the then modern present and future. This way they aimed at making the mechanical era accessible to the public in new ways and creating a sense of immediacy. Prampolini writes about this kind of "present- and/or future-presencing"[14] as follows:

> The artist can only pin his faith to the realities contingent on his own life or on those elements of expression which spiritualize the atmosphere he breathes. The elements and the plastic symbols of the *Machine* are inevitably much nearer to us (materially and spiritually) than any symbol of the past can be: symbols such as a god Pan, the taking down from the Cross, or the Assumption of the Virgin, etc.[15]

In contrast to these secular, quasi-religious celebrations of modernity, one can also find critical artistic manifestations arising from feelings of unease about the industrial present and an insecure future, often highlighting the negative side effects of industrialization and the rational organization of labor. Popular motifs here include the mentally and physically exhausted and nervous worker locked in the chains of industrial production and enslaved to the machine; the dejected, drunken, and gambling worker; the workers' unhealthy living and working conditions; and the unemployed worker, replaced by the machine.[16] Typical examples in the Luxembourg context include the linocuts made by the Luxembourg mine and steel worker, unionist, and artist Albert Kaiser

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"Der Mensch als Industriepalast" (Man as industrial palace). See Martin Kohlrausch and Helmuth Trischler, *Building Europe on Expertise: Innovators, Organizers, Networks* (New York: Palgrave Macmillan, 2014), 100, 106. See also Frederik Herman, Karin Priem, and Geert Thyssen, "Körper_Maschinen? Die Verschmelzung von Mensch und Technik in Pädagogik, Industrie und Wissenschaft," *Jahrbuch für Historische Bildungsforschung* 20 (2014): 47–75; Frederik Herman, Karin Priem, and Geert Thyssen, "Body_Machine? Encounters of the Human and the Mechanical in Education, Industry and Science," *History of Education* 46, no. 1 (2017): 108–27; Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (Berkeley: University of California Press, 1992); Käte Meyer-Drawe, "Maschine," in *Vom Menschen: Handbuch Historische Anthropologie*, ed. Christoph Wulf (Weinheim: Beltz, 1997), 726–37; Käte Meyer-Drawe, *Menschen im Spiegel ihrer Maschinen* (Munich: Fink Verlag, 1996).

14 Sharon MacDonald uses the concept of "past presencing" in her book *Memorylands: Heritage and Identity in Europe Today* (Abingdon: Routledge, 2013), 17.

15 Prampolini, "The Aesthetic of the Machine," 236.

16 For more information on the human and societal "energy question," see, e.g., Rabinbach, *The Human Motor*; Raf De Bont, "Energie op de weegschaal: Vermoeidheidsstudie, psychotechniek en biometrie in België (1900–1945)," *Belgisch Tijdschrift voor Nieuwste Geschiedenis/Revue Belge d'Histoire Contemporaine* 32, nos. 1–2 (2002): 23–71.

FIGURES 0.3 AND 0.4 Linocuts by Albert Kaiser. Reprinted from *Der tägliche Weg* (1932), 56, 38.

(1892–1973),[17] some of which were published alongside critical articles in the leftist newspaper *Escher Tageblatt* in 1931 (see figs. 0.3 and 0.4).[18] The long working days, the reification of the workers' bodies as mere cogs in the wheel of the machine, as well as the fear of physical and mental exhaustion are addressed in the following text:

> The most alarming thing one notices about the workers on their way to and from their shift is their fatigue, their listlessness, their resignation. One realizes that something unheard-of eats away at the core of their being, their vital nerve has been sawed through, their vitality paralyzed. Something has descended upon their humanity, which is worse than a catastrophe, a war, or a calamity: worse because it is not as brutal and jolting but slower, more imperceptible, and therefore all the more sinister and destructive. They have all come under the heel of capitalism, are nothing but a cog in the wheel of the economic process, a lever of the machine, a labor force. For eight long hours, they repeat the same work. They work like automatons. Their actions have become reflexes. They are members in the long chain of production, seconds in the history of a product.[19]

17 For more biographical details, see Frédéric Krier, Jacques Maas, Arnaud Sauer, and Denis Scuto, eds., *100 Joer fräi Gewerkschaften 1916–2016* (Esch-sur-Alzette: OPLG/Éditions Le Phare, 2016), 460.

18 These articles, together with the linocuts, were republished in 1932 in a collection entitled *Der tägliche Weg: Reportage aus Arbeiterzügen* (Esch-sur-Alzette: Luxemburger Genossenschaftsdruckerei, 1932). We thank Ira Plein for the reference and background information.

19 *Der tägliche Weg*, 27–28. Unless otherwise noted, all translations are the authors' own.

Two other themes common at the time, which also appear in Kaiser's linocuts, were the mutilation of bodies as a result of industrial accidents (see fig. 0.3) and the nostalgic longing for the country's rural past (see fig. 0.4). From the 1880s onwards, Luxembourg underwent a rapid and massive industrialization process, and Kaiser carefully staged facets of the country's rural past and the industrial present in order to catalyze affective responses, from romanticizing the natural and rural landscapes and glorifying agriculture to loathing the prospering mining and steel industries. By glorifying the past as an alternative way of life and linking this to the pressing contemporary questions of factory life, Kaiser's was a rather skeptical and gloomy "horizon of expectation."

These artistic manifestations, oscillating between celebration, critique, and mourning, fed into an expanding and varied "media ecology."[20] Indeed, a dynamic visual-material media ecology developed simultaneously with the rapid industrialization and maturing economy, giving rise to a "visual economy," in which all kinds of representations of the industrial world circulated.[21] The sheer quantity of visual representations of the industrializing world confirmed its importance as a historical process, while their circulation at the same time actively helped construct this world.[22] Starting in the late nineteenth century, different societal groups (e.g., artists, exhibitors, photographers, engineers, and entrepreneurs) with different intentions (e.g., artistic, commercial, and educational) "envisioned the industrial present" and thus contributed to the fabrication of a perceptual field and "horizon of expectation" against the backdrop of rapid changes.[23] The varied and dynamic media ecology, which took shape around Luxembourg's industrial present, made it possible for various audiences to encounter and experience the industrial present, to create meaning and make sense of their experiences. This media ecology—an ever-shifting mass and entanglement of images, objects, and texts (e.g., paintings, photographs, films, postcards, pamphlets, magazines, scale models, etc.)—was an expression of a strong "documentary impulse" and an impetus to create meaning and purpose, and also functioned as a key site for cultural learning or industrial enculturation through which identities were permanently negotiated,

20 Petra Löffler and Florian Sprenger, eds., "Medienökologien: Einleitung in den Schwerpunkt," special issue, *Zeitschrift für Medienwissenschaft* 14, no. 1 (2016).

21 Deborah Poole, *Vision, Race and Modernity: A Visual Economy of the Andean Image World* (Princeton, NJ: Princeton University Press, 1997).

22 Catherine E. Clark, "Capturing the Moment, Picturing History: Photographs of the Liberation of Paris," *American Historical Review* 121, no. 3 (2016): 824–60.

23 Koselleck, *The Practice of Conceptual History*, 126–27. See also Herman and Plein, "Envisioning the Industrial Present," 268–84.

constructed, and disseminated.[24] The constant repetition of the industrial motif inscribed the "machine age" and the "age of steel" in the collective memory, transformed industry from something alien into a cultural commonplace, and created "mythscapes" or "lieux de memoires" that helped shape national identity and eventually became a crucial part of the national heritage.[25] Therefore, and not surprisingly, industrialization in the period under investigation became a significant catalyst for nation-building, as the young nation tried to shape its own identity both in alignment with and in contrast to its larger neighbors Germany, France, and Belgium and to (re)produce national identifications that justified and legitimized its sovereign existence and fostered economic and cultural self-confidence.

2 The Industrialist and the Camera

Not least the photo and the movie camera would "lead to the creation of a fresh perception on the new world."[26] Indeed, capturing the "machine age" by

24 Stuart Franklin, *The Documentary Impulse* (London: Phaidon Press, 2016). For more information on cultural learning, see, e.g., Frederik Herman and Siân Roberts, "Adventures in Cultural Learning," *Paedagogica Historica* 53, no. 3 (2017): 189–98, esp. 194–95; Löffler and Sprenger, "Medienökologien"; Peter M. McIsaac and Gabriele Mueller, "Introduction," in *Exhibiting the German Past: Museums, Film, and Musealization*, ed. Peter M. McIsaac and Gabriele Mueller (Toronto: University of Toronto Press, 2015), 3–20; Astrid Erll and Ann Rigney, "Cultural Memory and Its Dynamics," in *Mediation, Remediation, and the Dynamics of Cultural Memory*, ed. Astrid Erll and Ann Rigney (Berlin: de Gruyter, 2012), 1–11; Paul Hodkinson, *Media, Culture and Society: An Introduction* (London: Sage, 2011); Thom F. Gencarelli, "Neil Postman and the Rise of Media Ecology," in *Perspectives on Culture, Technology, and Communication: The Media Ecology Tradition*, ed. Casey Man Kong Lum (Cresskill, NJ: Hampton Press, 2006), 201–53; Tim Edensor, *National Identity, Popular Culture and Everyday Life* (Oxford: Berg, 2002); Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 1999); Karin Priem and Frederik Herman, "Putting Male and Female Bodies in Their Places: Arenas and Theatres of Educational Reform," in *Education across Europe: A Visual Conversation,* ed. Catherine Burke, Ian Grosvenor, Béatrice Haenggeli-Jenni, Helena Ribeiro de Castro, Elena Tabacchi, Geert Thyssen, and Pieter Verstraete (Network 17 – Histories of Education, EERA, 2014), 43–46.

25 Duncan S. A. Bell, "Mythscapes: Memory, Mythology, and National Identity," *British Journal of Sociology* 54, no. 1 (2003): 63–81; Sonja Kmec et al., *Lieux de mémoire au Luxembourg: Usages du passé et constructions nationale/Erinnerungsorte in Luxemburg: Umgang mit der Vergangenheit und Konstruktion der Nation* (Luxembourg: Editions Saint-Paul, 2008); Sonja Kmec and Pit Péporté, *Lieux de mémoire au Luxembourg II: Jeux d'échelles/Erinnerungsorte in Luxemburg II: Perpektivenwechsel* (Luxembourg: Editions Saint-Paul, 2012).

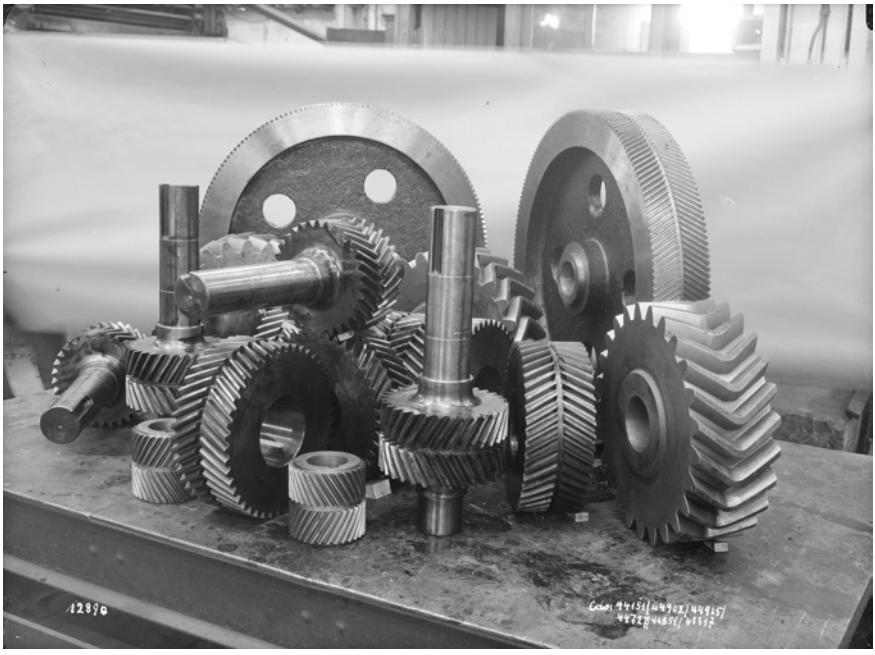
26 Dziga Vertov (the director of *Man with a Movie Camera*, 1923), cited in John Berger, *Ways of Seeing* (London: Penguin Books, 1972), 17. See also Paul Strand, "Photography and the New God," *Broom* 3, no. 4 (1922): 252–58.

means of the "mechanical eye" was thought to be the ideal pathway to open up new spaces of experience and to shape (collective) memory, making it possible for all to see the industrial cosmos through photographs and motion pictures in a mediated way rather than experience it directly.[27] Moreover, mechanical reproduction and mass production enabled the fast and infinite repetition, dissemination, and circulation of photographs across and throughout different media. Luxembourg's industrialists, or rather the photographers and filmmakers commissioned by them, were key producers of such pictures and gatekeepers of the visual economy. Indeed, the visual media became the means par excellence for corporate communication and the mass dissemination of the entrepreneurs' ideas and ideologies.[28] In their attempt to create a positive self-image in response to the anxieties and reservations about industrialization prevalent in society at large, industrialists were eager to control or even colonize the gaze of the masses. In doing so, they applied similarly futuristic ways of staging, aestheticizing, presenting, promoting, and normalizing the new industrial landscapes, machineries, lifestyles, and production processes.

Made for commercial purposes, the images shown in figures 0.5 and 0.6 are perfect examples of this approach, displaying a quasi-symmetrical and sculpture-like composition of products made by the Luxembourg steel company Aciéries réunies de Burbach-Eich-Dudelange (ARBED). This company,

27 Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations: Essays and Reflections*, ed. Hannah Arendt (London: Fontana, 1973), 219–53. See also Herman and Plein, "Envisioning the Industrial Present."

28 David E. Nye, *Image Worlds: Corporate Identities at General Electric, 1890–1930* (Cambridge, MA: MIT Press, 1985). See also Françoise Poos, "A Lived and Living History: The Glass Plates from the Institut Emile Metz as Tools of Corporate Communication," in *Forging a Modern Society: Photography and Corporate Communication in the Industrial Age* (*ARBED 1911–1937*), ed. Marguy Conzémius, Françoise Poos, and Karin Priem (Luxembourg: Centre national de l'audiovisuel, 2017), 40–53; Geert Thyssen and Klaus Dittrich, "Water and Dust: Recovering Washed-Out Pasts of Industry in Luxembourg," in Burke et al., *Education across Europe*, 63–66; Herman and Plein, "Envisioning the Industrial Present"; Plein, "Beautiful Luxembourg, Steel Works, and a Swimming Pool." See also, in this volume, Ira Plein, "Machines, Masses, and Metaphors: The Visual Making of Industrial Work(ers) in Interwar Luxembourg"; and Françoise Poos, "Photography as a Space for Constructing Subjectivities: Luxemburg's Steel Dynasties and the Modern Workforce as Seen through the Glass Plate Negatives from the Institut Emile Metz." The same occurred in the neighboring countries. See, for instance, Denis Woronoff, *La France industrielle: Gens des ateliers et des usines, 1890–1950* (Paris: Editions du Chêne, 2003); Klaus Tenfelde, *Bilder von Krupp: Fotografie und Geschichte im Industriezeitalter* (Munich: C. H. Beck, 2000); Elvire Perego, "Die Stadt-Maschine: Architektur und Industrie," in *Neue Geschichte der Fotografie*, ed. Michel Frizot (Cologne: Könemann, 1998), 196–223; Ralf Stremmel, *Industrie und Fotografie: Der "Bochumer Verein für Bergbau und Gussstahlfabrikation," 1854–1926* (Einbeck: Assendorff Verlag, 2017).



FIGURES 0.5 AND 0.6 Various products made by ARBED Dommeldange. Undated. Digital positives from glass plate negatives.
© INSTITUT EMILE METZ. CNA COLLECTION.

which is in many ways the protagonist of this publication, was a global player in the twentieth-century steel and iron business and the country's biggest employer until the decline of the steel industry in the late 1980s. ARBED thus not only shaped Luxembourg's past but also became a crucial part of the country's national heritage.[29] Indeed, ARBED became synonymous with the country's social progress and economic prosperity during the first two thirds of the twentieth century and developed into one of the most, if not *the* most important framework of national identification.[30] The steel company shaped the economic, social, and cultural identity of Luxembourg, not least through its sophisticated corporate communication strategies and the subtle and ongoing visual dissemination and celebration of the company's international economic successes and social welfare provisions. While shaping its own corporate image, it simultaneously affected and shaped the nation's self-understanding. The incorporation of modern and innovative technologies, such as the camera, played a significant role in the construction of this "corpornate" horizon and was both an expression and evidence of the industrialists' progressivism.[31]

Indeed, from its founding in 1911, ARBED used photography and motion pictures as seemingly objective and powerful media not only to communicate with its clients but also to attract new workers, document and record its history, and familiarize the population with the "machine age" and the social reality of modernity. Photography and film were practices that got institutionalized over time, as the steel company established its own photography department (*service photographique*) that existed until the late 1970s.[32] The company's

29 For more detailed information on the history of the company and its different mergers, see, for instance, ARBED, *Un demi-siècle d'histoire industrielle (1911–1964)* (n.p.: n.p., 1964/5).

30 "Between 1913 and 1974 some 20 to 25 percent of the Luxembourg population earned their living working in the iron industry": see Geert Thyssen and Karin Priem, "Brains, Money and Power in Education: Industrial-Intellectual 'Avant-Gardes' and Their 'Social Works,'" paper presented at the International Standing Conference for the History of Education (ISCHE) 35, Riga, Latvia, August 21–24, 2013. See also Antoinette Lorang, *Luxemburgs Arbeiterkolonien und billige Wohnungen, 1860–1940* (Luxembourg: Ministère du logement, 1995), 16–17; ArcelorMittal Luxembourg, ed., *La sidérurgie luxembourgeoise: Un siècle d'histoire et d'innovation/Steelmaking in Luxembourg: A Century of History and Innovation* (Luxembourg: ArcelorMittal, 2011), 8.

31 See Nancy Folbre, "The Invisible Heart," in *Global Dimensions of Gender and Carework*, ed. Mary K. Zimmerman, Jacquelyn S. Litt, and Christine E. Bose (Stanford, CA: Stanford University Press, 2006), 211–16.

32 Karin Priem, "What Happens When Archives and Research Are Transferred into the Physical Space of a Museum? 'La Forge d'une société moderne' and Other Stories," *Thinkering*

eagerness to visually portray its industrial cosmos led to the creation of a huge number of images, which until today are scattered all over the country, many not yet discovered. In 2010, a huge holding of some 2,400 glass plate negatives and positives was discovered at the Institut Emile Metz (IEM), ARBED's vocational school located in Dudelange.[33] It was the (re)discovery of this forgotten part of Luxembourg's industrial and educational heritage that triggered the FAMOSO research projects and that is at the heart of several chapters of this book. The glass plates as well as the many visual traces they have left in the course of traveling through time and space—for different spectators, in different contexts, and via different modes of reproduction and media—testify to the company's strong belief in the new visual technologies as engines of societal transformation, as vehicles for mediating modernity, and as a means of establishing a corporate and even national identity.[34]

(blog), *C²DH*, July 11, 2017, https://www.c2dh.uni.lu/thinkering/what-happens-when-archives-and-research-are-transferred-physical-space-museum-la-forge.

33 The glass plates were donated by the Amicale des Anciens Elèves du Lycée Technique Privé Emile Metz to the Centre national de l'audiovisuel (CNA) in Dudelange, Luxembourg, in 2007, restored by students in restoration from the University of Applied Sciences (HTW) in Berlin, and subsequently archived under the name "HISACS Institut Emile Metz." In the context of the FAMOSO projects, an exposition was organized from June 10 to December 17, 2017, at the CNA and a catalogue entitled *La Forge d'une société moderne: Photographie et communication d'entreprise à l'ère de l'industrialisation* (*ARBED 1911–1937*)*/Forging a Modern Society: Photography and Corporate Communication in the Industrial Age* (*ARBED 1911–1937*) was published in collaboration with the CNA, which contains more detailed information on the holding, the restoration of the glass plates, and the exposition; see Marguy Conzémius, Françoise Poos, and Karin Priem, eds., *Forging a Modern Society: Photography and Corporate Communication in the Industrial Age* (*ARBED 1911–1937*) (Luxembourg: Centre national de l'audiovisuel, 2017); Poos, "Photography as a Space for Constructing Subjectivities" (in this volume). For further information on the progressive vocational school and associated psychophysiological laboratory, see, in this volume, Karin Priem and Frederik Herman, "'Sensuous Geographies' in the 'Age of Steel': Educating Future Workers' Bodies in Time and Space (1900–1940)"; Frederik Herman and Karin Priem, "The Eye of the Machine: Labor Sciences and the Mechanical Registration of the Human Body." See also Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 592–614; Herman, Priem, and Thyssen, "Körper_Maschinen?"; Herman, Priem, and Thyssen, "Body_Machine?"

34 Bolter and Grusin, *Remediation*; Erll and Rigney, "Cultural Memory and Its Dynamics," 1–11. Reproductions of these glass plates appeared, for instance, in historical brochures, albums, magazines, ARBED promotional materials, and annual reports of the IEM.

3 The Adventurous Human and Social Engineer

Engineering a positive corporate horizon was key at this critical moment in the "age of steel"—a moment when social unrest and workers' protests and strikes posed a threat to the societal structures and called attention to the risks of societal transformation, modernization, and industrialization.[35] Such unrest not only jeopardized productivity and thus maximum profit, but also fuelled industrialists' fears of socialism, Marxism, communism, and syndicalism and made them engage in a variety of reform initiatives designed to counterbalance or at least soften the negative side-effects of industrialization. The liberal climate that reigned in Luxembourg at the time encouraged private initiative over and above state intervention. ARBED made use of this freedom to position itself as being in the vanguard of social welfare by setting up a number of social works for the benefit of the working classes.[36] Anticipating the social question, the captains of industry and their families frequently acted faster on this issue than the Luxembourg government.[37] The ad hoc and unstructured nature of many of their reforms testified to the Luxembourg industrialists' desire to present themselves as pioneers of charity and guardians of the working classes. Indeed, this was seen as vitally important to build workers' loyalty and gain the goodwill of the new working class at a time when the neighboring countries

35 "The social unrest of the years 1917–1921 that witnessed huge metallurgic strikes, plundering of shops in Esch-sur-Alzette, and a siege of the Chamber of Deputies is evidence of this." See Gilbert Trausch, "Joseph Bech (1887–1975)," *Nos Cahiers: Lëtzebuerger Zäitschrëft fir Kultur* 20, no. 3 (1999): 48.

36 See, e.g., Karin Priem and Geert Thyssen, "Fragmented Utopia: Luxembourgian Industrialists, Intellectual Networks and Social-Educational Reforms between Tradition and Avant-Garde," *Jahrbuch für Historische Bildungsforschung* 19 (2013): 106–26; Nadine Schmitz, "Le paternalisme d'Émile Mayrisch," in Barthel and Kirps, *Terres rouges,* vol. 3, 104–53.

37 It has been argued that ARBED's social welfare systems and institutions served as models for the emerging welfare state. See, e.g., ARBED, *Un demi-siècle d'histoire industrielle (1911–1964)*, 249. See also Jean Marx, "L'ARBED, un pionier de la formation professionelle au Luxembourg/ARBED, a Pioneer of Professional Training in Luxembourg," in ArcelorMittal Luxembourg, *La sidérurgie luxembourgeoise*, 161–3; John Castegnaro, "La sidérurgie à l'avant-garde des progrès sociaux/Steelmaking at the Forefront of Social Progress," in ArcelorMittal Luxembourg, *La sidérurgie luxembourgeoise*, 167–70; Irma Hadzalic, "Sick and Weak but Made of Steel: Luxembourgian Open-Air Schools and Other Responses to the Spread of Tuberculosis at the Beginning of the 20th Century," *Revista de História e Historiografia da Educação* 1, no. 1 (2017): 44–64; Enric Novella, "Tuberculosis and Political Economy: Industrial Wealth and National Health in the Grand Duchy of Luxembourg, c. 1900–1940," *Social History of Medicine* 31, no. 2 (May 2018): 308–27; Enric Novella, "Germs, Bodies, and Selves: Tuberculosis, Social Government, and the Promotion of Health-Conscious Behavior in the Early Twentieth Century" (in this volume).

went through a period of massive labor unrest.[38] It is, therefore, not surprising that the IEM glass plate holding also contains images depicting a variety of the company's "experiments in factory paternalism," which reached well beyond the factory walls.[39] These photographs depicting ARBED's social welfare provisions and progressive-era utopianism became central to its (inter)national corporate communication, masking and counterbalancing the disadvantages of industrialization, urbanization, and migration.[40]

Some of these glass plate images were also reproduced in a booklet entitled *Œuvres sociales*, published in 1922.[41] Presenting and magnifying ARBED's social, educational, and health-care initiatives and achievements, the booklet was partly a response to Catholic conservative circles and a number of socialist and communist workers' associations. Conservative stakeholders had strongly criticized Luxembourg's transformation from an agrarian to an industrial society, with its concomitant rise in immigration and growing social tensions, whereas representatives of the left were mainly concerned about the living and working conditions of the working class. The initiatives listed in the booklet served as a counter-argument, showcasing ARBED's social policy and governance, its industrial and economic leadership, and its innovative (semi-) scientific approaches and management methods, which would "rescue man from the tyranny of the machine."[42] *Œuvres sociales* lists forty-two institutions and initiatives for children, workers, and their families, all of which had been established by the company (or its precursors) between 1865 and 1920. These included anti-tuberculosis campaigns, open-air schools, sanatoriums, preventoriums, and hospitals, but also scout initiatives and holiday camps, housing projects, sales cooperatives (*economats*), leisure-time facilities, workers' canteens, and a vocational training school. A number of more recent ARBED initiatives—some of which had been set up in cooperation with the

38 The neighboring countries, where the industrial revolution had commenced somewhat earlier, were plagued by social unrest and general strikes in the first decades of the twentieth century; see Anne Steiner, *Le temps des révoltes: Une histoire en cartes postales des luttes sociales à la Belle Epoque* (Paris: L'Échappée, 2015). Important strikes in Luxembourg took place in 1912, 1917, and 1921; see Gilbert Trausch, *Contributions à l'histoire sociale de la question du Luxembourg, 1914–1922* (Luxembourg: Saint-Paul, 1974).

39 Eric J. Evans, *The Shaping of Modern Britain: Identity, Industry and Empire, 1780–1914* (Harlow: Pearson Education Limited, 2011), 249.

40 See Elspeth H. Brown, "Welfare Capitalism and Documentary Photography: N. C. R. and the Visual Production of a Global Model Factory," *History of Photography* 32, no. 2 (2008): 137–51.

41 ARBED, *Œuvres sociales* (Luxembourg: Victor Bück, 1922).

42 Mathew Thomson, *Psychological Subjects: Identity, Culture, and Health in Twentieth-Century Britain* (New York: Oxford University Press, 2006), 140.

FIGURE 0.7 Hospital Maison des Enfants in Dudelange—isolation pavilion for children (1923). PHOTOGRAPH. © ARCHIVES DE LA VILLE DE DUDELANGE – FONDS JEAN-PIERRE CONRARDY.

Société Terres Rouges, another major player in the Luxembourg steel and iron business—were described in greater detail, such as the open air school (*école de forêt*) in Dudelange, the sanatorium and preventorium (*maison des enfants*) in Kreuzberg (see fig. 0.7), and the Institut Emile Metz, a school for vocational education and professional orientation in Dommeldange. By addressing broader social questions such as urbanization, migration, and health, ARBED's efforts in human and social engineering went far beyond the mere organization of the workplace and solving work-related problems of industrialization. These very efforts aimed to create a skilled, indefatigable, and loyal workforce, redesign the social fabric, and establish new lifestyles, while at the same time targeting the micro-level of the workers' bodies and minds, the meso-level of the factory, and the macro-level of society. They thus affected and colonized all aspects of workers' lives, including schooling, leisure time, consumption, social interactions, family life, and the workplace.

4 The Eclectic Philanthrocapitalist

Œuvres sociales mirrors the contradictory assemblage of paternalistic, elitist, romantic, socialist-progressive, utopian, and traditionalist values and trends that characterized the eclectic mentality of many captains of industry and

their families in the West during the modern era.[43] Indeed, the Luxembourg industrialists used elements from multiple philosophies and ideologies to shape and justify their own "corpornation."[44] Inspired by similar social works set up for the new working classes in the neighboring countries, they appropriated and adapted these existing models while using their national and international networks as critical soundboards and as information, discussion, and promotion platforms. The entrepreneurial families traveled the world to cut economic and political deals and discover "new" cultural, societal, social, and educational reforms and surrounded themselves with actors from the entangled political, diplomatic, economic, artistic, and intellectual spheres.

The Verein für die Interessen der Frau/Association pour les intérêts de la femme, the Décades de Pontigny, the Colpach circle, the Union de la vérité of Paul Desjardins, the Deutsch-Französisches Studienkomitee/Comité franco-allemand de documentation et d'information, and the Entente Internationale de l'Acier/Internationale Rohstahlgemeinschaft were the key networks at the time. Addressing literary-aesthetic, philosophical, political, religious, economic, social, educational, international, and feminist issues, these circles were the most important discussion forums for Luxembourg's industrialists and their families.[45] Their engagement in these transnational networks, and in feminist

43 See, for example, Evans, *The Shaping of Modern Britain*, 249–50; Harold James, *Krupp: A History of the Legendary German Firm* (Princeton, NJ: Princeton University Press, 2012); Michael Rowlinson and John Hassard, "The Invention of Corporate Culture: A History of the Histories of Cadbury," *Human Relations* 46 (1993): 299–326; Rüdiger Stolz and Joachim Wittig, eds., *Carl Zeiss und Ernst Abbe: Leben, Wirken und Bedeutung* (Jena: Universitätsverlag Jena, 1993); Meike G. Werner, *Moderne in der Provinz: Kulturelle Experimente im Fin de Siècle Jena* (Göttingen: Wallstein, 2003); John Cunliffe and Guido Erreygers, "The Enigmatic Legacy of Charles Fourier: Joseph Charlier and Basic Income," *History of Political Economy* 33 (2001): 459–84; Peter Scholliers, "The Social-Democtratic World of Consumption: The Path-Breaking Case of the Ghent Cooperative Vooruit Prior to 1914," *International Labor and Working-Class History* 55 (1999): 71–91; Geert Thyssen, "Between Utopia and Dystopia? Case Studies of Open-Air Schools in Belgium, France, Germany and Italy (c. 1904–1979)" (PhD diss., Catholic University of Leuven, 2009); Geert Thyssen, "Engineered Communities? Industry, Open-Air Schools, and Imaginaries of Belonging (c. 1913–1963)," *History of Education & Children's Literature* 10, no. 2 (2015): 297–320.

44 For a definition and a more detailed discussion of the term "corpornation," see Irma Hadzalic, "Transatlantic Iron Corpornations: The Expansion of Luxembourg's Steel Industry to Brazil and the Emergence of Industry-Related Social Welfare in Minas Gerais, ca. 1910–1965" (PhD diss., University of Luxembourg, 2018).

45 Thyssen and Priem, "Brains, Money and Power in Education." See, in this volume, Klaus Dittrich, "Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period." See also Cornel Meder, ed., *Toute la noblesse de sa nature: Recueil des écrits publiés par Aline Mayrisch-de Saint Hubert réunis par Cornel Meder avec postfaces des professeurs Frank Wilhelm et Hans Manfred Bock et une chronologie*

circles in particular, encouraged the female members of industrialist families to take part in discussions about Europe's future and to visit social and educational initiatives that were perceived as groundbreaking models at the time.[46]

The reforms pursued in Luxembourg thus have to be understood as a result of various reflections *of* and *on* modernity by various local, national, or even global interest groups (e.g., industrialists, writers, artists, architects, designers, representatives of the medical and educational professions) in various knowledge fields (e.g., economic, medical-sanitary, architectural, educational, aesthetic, ideological, and political) whose constituents and actors mutually influenced each other in and across intellectual networks. By moving within these "glocal" networks, the industrialists became equipped with nuanced and hybrid thought styles—blending, for instance, capitalism, socialism, science, etc.—which made them efficient reformers. By using manifold channels of communication and modern technologies, they could easily outperform government officials, traditionalist church representatives, and political decision-makers.[47]

The industrial-intellectual avant-gardes soon labeled the social reforms they appropriated, initiated, and implemented as the "Luxembourg model" and eagerly displayed their philanthropic endeavors on the international scene. Indeed, they not only competed to thrive on the economic market but also to establish superiority over other companies in the sphere of industrial welfare. The charitable sector became a big business in itself, not least because it further empowered and enriched the industrialists. As a result, the huge investments in philanthropic and social welfare initiatives by ARBED's captains of industry should not be described as pure philanthropy but rather as "philanthrocapitalism": a "pay out and claw back" arrangement which, in the end, served the economic interests of capital.[48]

(Ehlerange: Cercle des Amis de Colpach, 2014); Hans Manfred Bock, "Colpach als transnationales Netzwerk," in Meder, *Toute la noblesse de sa nature*, 315–402.

46 See, e.g., Andrée Mayrisch, "Impressions de Moscou," *Galérie: Revue culturelle et pédagogique* 12 (1994): 201–14; Priem and Thyssen, "Fragmented Utopia."

47 Guido Müller, "Andrée Mayrisch und Pierre Viénot – ein politisches Paar zwischen Berlin und Paris (1923–1940)," in *Les années trente: base de l'évolution économique, politique et sociale du Luxembourg d'après guerre? Actes du colloque de l'A.L.E.H. du 27–28 Octobre 1995* (Luxembourg: Editions Saint Paul, 1996), 131–48.

48 See Lynn Fendler, "The Gates Foundation MET Research Project as a Case of Philanthrocapitalism," paper presented at the annual meeting of the Research Community "Philosophy and History of the Discipline of Education," Brussels, Belgium, November 11–13, 2016; Thyssen and Priem, "Brains, Money and Power in Education." See also Linsey McGoey, *No Such Thing as a Free Gift: The Gates Foundation and the Price of Philanthropy* (London: Verso, 2015).

5 The Humanist Scientific Manager

While ARBED's captains of industry did not really obscure the class, economic, and capitalist interests they pursued, they felt the need to promote their model of industrial civilization and rational organization of labor in new humanist and scientific terms.[49] Indeed, they framed the pressing questions that arose with industrialization, urbanization, and migration within supposedly objectified scientific, medical, and educational discourses, underpinned their socio-educational interventions with scientific and ethical rationales, and eagerly made use of modern medical scientific apparatuses to test, train, and rehabilitate their workforce and the working class at large.[50] Examples for the latter include the many revolutionary testing and training apparatuses used in the IEM's psychophysiological laboratory (founded in 1919) and modern sanitation and bathing equipment, such as the up-to-date ionized water cure equipment used in the hospital of Dudelange (see fig. 0.8), from the 1920s onwards.

FIGURE 0.8 Hydrotherapy installation—ionization by electrolysis (1923). PHOTOGRAPH. © ARCHIVES DE LA VILLE DE DUDELANGE – FONDS JEAN-PIERRE CONRARDY.

The transition from the "age of mechanism" to the so-called new "age of humanism"—with its strong focus on the so-called "lower subjects" (such as factory workers, prisoners, prostitutes, the insane, disabled, and sick), their bodies and minds, their needs and interests—was triggered or at least advanced

49 Thomson, *Psychological Subjects*, 140–47.

50 See also Novella, "Germs, Bodies, and Selves"; Herman, "Forging Harmony in the Social Organism."

by various scientific developments, from statistics and social physics to social hygiene; from psychophysiology, labor sciences, and industrial psychology to infection theories and bacteriology; from evolution and heredity theories to social utopian ideas.[51] Progressive industrialists soon saw the advantage of articulating their vast social and scientific ambitions and their positivist faith in scientific management, as the sciences provided them with both an excuse and a medium to intervene in workers' lives, as well as a means to deflect accusations of selfishness.[52] Indeed, this scientific framing gave industrialists the necessary credibility and allowed them to contribute actively to both the construction of the problem and its solution: the creation of a healthy, indefatigable, skilled, harmonious, and loyal labor force.

The rise of labor, or industrial, psychology also impacted the way the industrial entrepreneurs managed their workers. The latter were seen as trainable subjects who permanently had to be observed, monitored, and studied by the employers' experts (e.g., scientists and health workers) who delivered the necessary information to guide and train them in their learning, working, and living environments (e.g., through vocational training, health, and prevention campaigns). Education and prevention thus became the keystones of ARBED's management interventions, complementing the social welfare provisions that aimed to improve the general working and living conditions of the workers (e.g., by creating workers' colonies, providing accident and health insurances,

51 See, for example, de Bont, "Energie op de weegschaal"; Rabinbach, *The Human Motor*; Marc Depaepe, *Zum Wohl des Kindes? Pädologie, pädagogische Psychologie und experimentelle Pädagogik in Europa und den USA, 1890–1940* (Leuven: Leuven University Press; Weinheim: Deutscher Studienverlag, 1993); Katja Patzel-Mattern, *Ökonomische Effizienz und gesellschaftlicher Ausgleich: Die industrielle Psychotechnik in der Weimarer Republik* (Stuttgart: Franz Steiner Verlag, 2010); Abram De Swaan, *In Care of the State: Health Care, Education and Welfare in Europe and the USA in the Modern Era* (Cambridge: Polity Press, 1988); Waltraud Ernst and Bernard Harris, eds., *Race, Science and Medicine, 1700–1960* (London: Routledge, 1999); Dorothy Porter, ed., *The History of Public Health and the Modern State* (Amsterdam: Rodopi, 1994); David M. Gordon, *Liberalism and Social Reform: Industrial Growth and Progressiste Politics in France, 1880–1914* (London: Phaidon, 1982); Barbara Weinstein, *For Social Peace in Brazil: Industrialists and the Remaking of the Working Class in São Paulo, 1920–1964* (Chapel Hill: University of North Carolina Press, 1996); Barbara Weinstein, *The Color of Modernity: São Paulo and the Making of Race and Nation in Brazil* (Durham, NC: Duke University Press, 2015); Gudrun M. König, *Konsumkultur: Inszenierte Warenwelt um 1900* (Vienna: Böhlau, 2009); Karin Priem and Christine Mayer, "Learning How to See and Feel: Alfred Lichtwark and His Concept of Artistic and Aesthetic Education," *Paedagogica Historica* 53, no. 3 (2017): 199–213.

52 See also Herman, "Forging Harmony in the Social Organism."

or offering medical therapies). It was believed that appropriate training and prevention campaigns in the long run would make other (costly) social welfare provisions redundant or at least less necessary.

Indeed, ARBED applied scientific management as a means of human and social engineering avant la lettre. The science-based organization of labor and social reform was said to hold at least the promise of a better future, both for the worker and the employer. Whatever ARBED's motivations at the time (ethical, managerial, economic), the company actively tinkered with and fine-tuned the "social engine" and the "human machine"—and, by doing so, promoted and cultivated the complex metaphors of the body as machine, locomotive, motor, or clockwork, which were already widely used in medical and literary writings.[53] The body—be it the social or the individual body—was perceived as and handled like a machine that could be repaired, perfected, energized, and harmonized.

6 The Structure of the Book

As a collection of socio-cultural (hi)stories of technology, industry, and, more broadly, modernity, this book provides insight into the shaping of the modern subject, the harmonization and stratification of the social fabric in the "age of steel," and the entangled thought styles, mechanisms, and materialities that gave birth to the complex of modern life in Luxembourg at the turn of the twentieth century. This anthology focuses on the various rationales and processes of human and social engineering and identity construction (including at the individual, regional, national, international, corporate levels) and on their mediation through various modes of (re)presentation and different media such as photography and film, promotional brochures, corporate albums, and popular magazines, but also scientific practices of experimentation, display, and visualization. Drawing upon cultural and visual theories, the following chapters examine visual and textual (re)presentations of bodies—of

53 Alan Hyde, *Bodies of Law* (Princeton, NJ: Princeton University Press, 1997), 34. According to Hyde, the machine metaphor was used to convey the following ideas (emphasis in the original): "First, the body is a machine because it is *like other bodies.* Because bodies are machines or mechanical, medical therapies that work for one patient should work for another. … Second, the body is a machine because of the *deadening effects of industrial production.* These machine bodies experience fatigue, wear out, require maintenance. Third, the body is a machine when it is *perfect.*"

apprentices, workers, and captains of industry—in the context of a variety of internationally entangled progressive reforms.[54]

The first section of the book, entitled "Modeling Subjectivities," gathers contributions that deal with visual (re)presentations of individual and social bodies in the "age of steel." The authors in this section explore how the visual became part of overarching discourses on the making of the new worker and the working class, industrial civilization, and the nation at large; they also ask how it might have played a major role in community- and nation-building processes and identity formation. Their contributions offer insights into how different media played an instrumental role in shaping individual, collective, and corporate identities and subjectivities in times of industrialization. In the first chapter, "Machines, Masses, and Metaphors: The Visual Making of Industrial Work(ers) in Interwar Luxembourg," Ira Plein analyzes different depictions of labor and especially of the working man's body. She shows how these motifs circulated and were (re)mediated by different actors, such as the labor movement and industrial stakeholders, in interwar Luxembourg, functioning as instruments of meaning-making and as tools crystallizing and raising awareness of (the ills of) a mechanized and industrialized civilization. In the second chapter, "Photography as a Space for Constructing Subjectivities: Luxembourg's Steel Dynasties and the Modern Workforce as Seen through the Glass Plate Negatives from the Institut Emile Metz," Françoise Poos concentrates on the human protagonists and walk-ons in the glass plate negatives of the CNA holding. She argues that the photographs were used to shape the experiences and construct the subjectivities of both the workers and the industrial entrepreneurs, while simultaneously creating and reinforcing corporate and national imaginaries. In the third chapter, "Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period," Klaus Dittrich takes us on an intellectual and spiritual journey to the East along with Aline Mayrisch de Saint-Hubert, the wife of ARBED director Emile Mayrisch.

54 The theoretical literature includes Arjun Appadurai, ed., *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 1986); W. J. T. Mitchell, *Picture Theory: Essays on Visual and Verbal Representation* (Chicago: University of Chicago Press, 1994); Gillian Rose, *Visual Methodologies: An Introduction to Researching with Visual Materials*, 3rd ed. (London: Sage, 2012); Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); Richard Sennett, *The Craftsman* (London: Allen Lane, 2008); Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, 1973); Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (1983, London: Verso, 2006). On the steel industry and reforms, see Castegnaro, "La sidérurgie à l'avant-garde des progrès sociaux/Steelmaking at the Forefront of Social Progress."

In her search for alternative approaches to industrialist-capitalist civilization and modern life, the socially active Mayrisch de Saint-Hubert traveled to East Asia in the 1930s, where she also participated in the Fifteenth International Congress of the League of Red Cross Societies in Tokyo in 1934. Focusing on this business trip, her intellectual and spiritual journey, as well as the ideas she shared with her friends from various intellectual networks, Dittrich explores how Mayrisch, in her attempt to become a modern female intellectual, struggled with the tensions between tradition and modernity.

The second section, "Mapping Bodies and Senses," focuses on the professional orientation and vocational training program at the Institut Emile Metz and looks at how the institute used scientific approaches to test and improve apprentices' bodies and their psycho-physical and sensory interactions with the technosphere, thus shaping human-machine relationships more generally.[55] Both contributions to this section examine various testing and training practices and psychometric technologies that were applied at ARBED's progressive vocational school. In chapter four, "'Sensuous Geographies' in the 'Age of Steel': Educating Future Workers' Bodies in Time and Space (1900–1940)," Karin Priem and Frederik Herman explore the various forms of 'sensory' learning designed to generate body knowledge and embodied professional skills as well as to enhance the workers' emotional well-being and psychological attachment to the technosphere. The authors argue that these sensory learning processes encoded moral values and evoked intimacy and feelings of ownership rather than alienation. In their second contribution, "The Eye of the Machine: Labor Sciences and the Mechanical Registration of the Human Body," Herman and Priem examine how workers' bodies and senses were mapped, measured, displayed, and, in the end, shaped by machine-mediated observation. This fifth chapter of the volume analyzes new experimental settings and new ways of observing and making visible what was once invisible by taking a closer look at the work of Jules M. Amar, a progressive French labor scientist. Amar believed that the new tools of mechanical and structural objectivity would allow him to create a most efficient and indefatigable workforce.

The three chapters of the third section, "Engineering Social Change," zoom in on various social and educational initiatives set up by industrialists in Luxembourg and abroad and on the discourses that allowed the captains of industry to intervene in workers' lives and to shape a new model "worker" and "citizen." In chapter six, "Germs, Bodies, and Selves: Tuberculosis, Social Government, and the Promotion of Health-Conscious Behavior in the Early

55 See also Herman, Priem, and Thyssen, "Körper_Maschinen?"; Herman, Priem, and Thyssen, "Body_Machine?"; Priem and Herman, "Hautnah."

Twentieth Century," Enric Novella argues that the supposedly neutral concept of health (and science) and the educational framing of social problems enabled the industrialists to intrude into the private lives of the laboring classes and to spread new values, habits, and ways of life. The "homo hygienicus" became the model for the creation of the "new worker" and the "new citizen," for the benefit of the company and the nation. In chapter seven, "Transatlantic Iron Connections: Education, Emotion, and the Making of a Productive Workforce in Minas Gerais, Brazil (ca. 1910–1960)," Irma Hadzalic looks at a specific case that illustrates how ARBED's utopian social ideas and economic rationales—and the so-called Luxembourg corporate social welfare model—traveled around the globe and were adapted to other contexts, in this case the Brazilian state of Minas Gerais.[56] Hadzalic investigates how social and educational initiatives were used as "technologies of power" to create a loyal, obedient, qualified, and productive workforce in Minas Gerais. Finally, the section concludes with an essay by Angelo Van Gorp, which takes a socio-ecological perspective on the history of another industrial cosmos, namely the U.S. American steel town of Gary, Indiana. Gary became a model of progressive education and city planning, but unlike Luxembourg it gradually lost its vitality and viability. Van Gorp thus suggests that one solution to halt Gary's decline may be to promote social cohesion by fostering community-based social and educational interventions.

This book aims to provide a socio-cultural history of industrialization that draws on a wide variety of sources in a non-hierarchical way. Often-neglected visual sources are given equal consideration as textual sources, which opens up new avenues of research on the human body and its senses, the importance of the material world, and innovative technologies in times of industrialization. We started our research at the national level in Luxembourg. It soon turned out, however, that national particularities and idiosyncrasies of industrialization were enmeshed and entangled with international trends influencing the material-technological, sensory, and mental worlds in the "age of steel." Most chapters of the book focus on how industrialists and their families addressed a large array of challenges, borrowing and mixing ideas originating in domains such as corporate identity formation, mediatization, scientification, technological innovation, mechanization, capitalism, mass production, medicalization, educationalization, artistic production, and social utopia, while competing with other interest groups who pursued their own goals. Therefore, all these trends are analyzed as interconnected and enmeshed socio-cultural phenomena. This collection of essays does not refer to or elaborate on alienation theories, nor does it focus exclusively on economic change, technological

56 See also Hadzalic, "Transatlantic Iron Corpornations."

innovation, and the effects of mass production; it rather combines different and seemingly incompatible focus areas of modernity, and analyzes how humans created, mediated, became attached to, and interacted with the technospheres of modern societies. The editors hope that this book will inspire future research in the history of industrialization.

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PART 1

Modeling Subjectivities

CHAPTER 1

Machines, Masses, and Metaphors: The Visual Making of Industrial Work(ers) in Interwar Luxembourg

Ira Plein

1 Introduction

In the late nineteenth and early twentieth centuries, monumental steel plants transformed Luxembourg's agrarian countrysides into new industrial landscapes; worker immigration led to the rapid growth of villages into cities; and modern production techniques and rationalization changed the customary rhythms of life and work and created a new demand for a skilled industrial workforce. These were elementary changes, to which the society and the population needed to adapt. Visual representations of the steel industry and industrial work(ers) familiarized society with the rapidly changing environment.[1] In Luxembourg, as in other industrial countries, images of work contributed to a public discourse that involved industrial companies, policymakers, unions, artists, photographers, and other groups or individuals—all of them deliberately trying to shape the perception of industrial work(ers). These images reflected different perspectives, interests, and agendas, which generated conflicting and continually changing visual representations. The images were published in different media and circulated in the public sphere, contributing to the making of meaning and value of industrial work, the perception of the steel and mining

1 The social institutions that were initiated by the steel industry also played an important role in the self-presentation of the steel industry in Luxembourg. See, for instance, Antoinette Lorang, *L'image sociale de l'Arbed à travers les collections du Fonds du logement* (Luxembourg: Le Fonds pour le développement du logement, 2009). For earlier examples of the visual mediation of the steel industry in Luxembourg, see Frederik Hermann and Ira Plein, "Envisioning the Industrial Present: Pathways of Cultural Learning in Luxembourg (1880s–1920s)," *Paedagogica Historica* (2016): 1–17, http://dx.doi.org/10.1080/00309230.2016.1259243; see also Frederik Herman, Karin Priem and Geert Thyssen, "Körper_Maschinen? Die Verschmelzung von Mensch und Technik in Pädagogik, Industrie und Wissenschaft," *Jahrbuch für Historische Bildungsforschung* 20 (2015): 47–75; Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 592–614.

industry, and, not least, the image and self-image of industrial workers within Luxembourg society.

This paper investigates visual (re)presentations of industrial work(ers) in the Luxembourg steel industry during the interwar period, drawing on examples in different artistic genres and media, such as film, photography, corporate communications, sculpture, painting, and the graphic arts. As industrial work and a growing proletarian working class were a new phenomenon in Luxembourg society, the topic only slowly entered the visual media.[2] It was only after World War I and in the wake of major economic, political, and societal changes in Luxembourg that one can speak of a diversity of perspectives and a rising interest in images of industrial work(ers). First, the exit from the German Customs Union forced the steel industry to open up new markets—an undertaking that was supported by commercial propaganda employing mainly photography and film. Second, as the country's new leading economic force, the steel industry became increasingly important for the visual self-presentation of the Grand Duchy of Luxembourg. Third, the evolving working class found its own ways of artistically expressing proletarian perspectives on industrial work and the worker.

By looking at examples in various media, I will analyze the conflicting images and representations of the industrial worker in his immediate industrial environment and in relation to the larger "industrial organism"[3]; as a

2 The first (and long-running) debate on the steel industry, which can also be traced in the visual media of the turn of the century, related to the Luxembourg landscape. See Ira Plein, "Beautiful Luxembourg, Steel Works, and a Swimming Pool: The Corporate Film COLUMETA and the Formation of a Corporate, and National, Image," in *Films That Work Harder: The Global Circulations of Industrial Cinema*, ed. Vinzenz Hediger, Florian Hoof, and Yvonne Zimmernamm (Amsterdam: Amsterdam University Press, forthcoming).

3 Biological metaphors were frequently used at the time for various systems, such as the economy, but also for exhibitions. For biological metaphors of the economy in Alfred Marshall's *Principles of Economics* (1890), see Persio Arida, "Soziale Differenzierung und Wirtschaftstheorie," in *Soziale Differenzierung: Zur Geschichte einer Idee*, ed. Niklas Luhman (Opladen: Westdeutscher Verlag, 1985), 68–95; for the use of "organische Betriebsgestaltung" (organic business formation) and the "Werkskörper" (corporate body) in the German Ruhr area, see Dagmar Kift, "'Die schaffende Menschenkraft bewirtschaften': Zur Schulung und Erziehung von Arbeiter- und Werkskörpern im Ruhrbergbau der 1920er Jahre," in *Kontrollierte Arbeit – disziplinierte Körper? Zur Sozial- und Kulturgeschichte der Industriearbeit im 19. und 20. Jahrhundert*, ed. Lars Bluma and Karsten Uhl (Bielefeld: transcript Verlag, 2012), 73–106; for the biological metaphor in the context of the Gesolei exhibition (1926), see Angela Stercken, "Die Gesolei als Schaubild des Körpers: Sektionen, Überblick," in *Kunst, Sport und Körper | GeSoLei 1926–2002*, ed. Hans Körner and Angela Stercken (Ostfildern: Hatje Cantz Verlag, 2002), 19–24. The analogy also worked the other way around; see, for example, Fritz Kahn's depiction of the human body as an industrial palace in "Der Mensch als Industriepalast," a poster that

representative of the industry at large; and as a representative of the working class. To analyze images as visual contributions to a discourse on *how to see* industrial work(ers), we need to look at what was shown in the images; what specific images and perceptions of industrial work(ers) were constructed and communicated to the audience; and how these messages were defined by authorship, the imaging technology used, and the context of display.

2 The Worker's Body as Part of the Industrial Organism

> In the deep mines and the magnificent factories, thousands of workers are toiling away at a particularly difficult task. Most of you are only dimly aware of the work done by these anonymous people. They, too, wanted to show you their essential and obscure task. You will visit a mine where you will see the miner's work and the set of tools that he uses to wrest from the soil the precious mineral that is the basis for our national wealth. You will see on the screen the work of the blast furnace worker, the steelmaker, the smelter, the rolling-mill operator, of an entire work world conscious of its value. You will admire the grandeur and the complexity of the industrial organism, where the hand unites with the brain in a harmony that we strive to render as perfect as possible.[4]

These sentences were part of the opening speech that Nicolas Wagner, mining director of the steel company ARBED (Aciéries réunis de Burbach-Eich-Dudelange), gave at the first Luxembourg National Trade Fair in the industrial city of Esch-sur-Alzette in September 1923. Initiated by ARBED director Emil Mayrisch and executed under the auspices of a committee that consisted of high-ranking politicians and industrialists, the ten-day trade fair was designed to showcase Luxembourg's crafts, industry, agriculture, education, vocational training, and social hygiene, as well as the country's history, literature, and fine arts.[5] Wagner's statement was reinforced by the exhibition's visual presentation of industrial processes and human labor in a variety of media, including

supplemented Fritz Kahn, *Das Leben des Menschen*, 5 vols. (Stuttgart: Franckh'sche Verlagshandlung, 1926).

4 "Ausstellung der Stadt Esch-Alz," *Luxemburger Wort*, September 8, 1923, 4. Unless otherwise noted, all translations are the author's.

5 See the exhibition program in the official catalogue *Exposition nationale des arts et métiers, du commerce et du travail à Esch-sur-Alzette du 8 au 18 septembre 1923* (Esch-sur-Alzette: Société cooperative, 1923).

photography, film, and a life-size replica of an ore mine.[6] A major objective of the trade fair was to promote vocational training and the existing institutions in the field.[7] Consequently, the mining director explicitly acknowledged and recognized the various industrial trades. At the same time, he emphasized the sublime "industrial organism," where "the hand unites with the brain." From his speech, it is not clear what exactly this alliance of the hand and the brain referred to. From the perspective of the industrial organism, it could signify the smooth and efficient collaboration of the workers (hands) under the supervision of the engineers (brains). With regard to the promotion of vocational training at the trade fair, it could also emphasize the added value of craftsmanship, requiring the coordination of the individual worker's trained hands and skilled brain, which was a core objective of the company's vocational school.[8] Both meanings would be relevant for the industry's self-presentation, since the skilled worker was seen as an essential element for the functioning of the overarching industrial organism.

These complementary layers of meaning-making—from the individual worker to the overarching industrial organism—can also be found in the industry's visual self-presentation. The mining director's mention of the different professions to be seen "on the screen" most likely refers to (sequences of) the corporate film *Columeta*, a promotional film produced by Luxembourg's leading steel company ARBED and its subsidiary Terres Rouges in 1921/22, which showed the workers during the various stages of steel production, from the ore mine to the final product.[9] As the mining director's speech suggests, the film

6 One room at the fair was equipped with a cinema projector to present films on the iron industry. See "Die National-Ausstellung in Esch an der Alzette," *Obermosel-Zeitung,* September 11, 1923, 1–2. The details of the mine replica—the authentic rock formations, real railways and minecarts for transport, timbered chutes, lighting systems, the presentation of drilling methods and the extensive explanations for visitors—were also reported in the press. See "Exposition nationale des arts et métiers, du commerce et du travail," *Escher Tageblatt*, September 12, 1923, 1; and "Über den Abbau der im Boden lagernden nutzbaren Mineralien," *Tageblatt*, September 22, 1923, 4–5.

7 The quality of the training was demonstrated and visualized by a competition and a display of craft items made by apprentices.

8 At the Institut Emile Metz, the students were tested in a highly modernist psychophysiological laboratory, in order to determine the occupation most suitable for each candidate. It was precisely this combination of theoretical and practical training that was thought to result in skilled workers. See Herman, "Forging Harmony in the Social Organism"; Karin Priem and Frederik Herman, "'Sensuous Geographies' in the 'Age of Steel': Educating Future Workers' Bodies in Time and Space (1900–1940)" (in this volume).

9 An original full-length version of the film is not preserved. For this essay, I am referring to the reconstructed version of 1997, *Vu Feier an Eisen* (Of Fire and Iron), published by the Centre national de l'audiovisuel (CNA). The greater part of the film presents the processes of steel

features the workers as independent motifs, representing the unity of hands and brain in their respective trades. Several scenes communicate different hierarchical ranks within the industrial process. Where the tasks do not require specific skills, the workers are presented as a collective and disciplined workforce, monitored and supervised by foremen or engineers (see fig. 1.1a). In these scenes, it is not the workers but the foremen or engineers who are responsible for the industrial production.[10] Another scene shows the milling process, with a mill train worker posing in a particularly proud posture, indicating his pride in mastering the huge and presumably dangerous machine (see fig. 1.1b). Tasks that require specific skills or training are occasionally filmed in close-ups—sometimes showing the worker as a responsible and qualified collaborator, sometimes cropping the worker's head and focusing on the performance of his "trained hands" (see fig. 1.1c).

The mining director's speech suggests that the film features the workers as skilled craftsmen, representing the unity of hands and brains in their respective trades—a perspective that contributed to the social stratification of the workers on the basis of their vocational training. However, the actual main motifs of the corporate film are not the workers but rather the plants and production processes. Throughout most of the film, the worker(s) must be considered as a subordinate motif, whose predominant task is to be part of a functioning machinery: the industrial organism. Panoramic views and long shots of the industrial sites and plant interiors emphasize the vast dimensions

FIGURES 1.1A, 1.1B, AND 1.1C Frames from *Vu Feier an Eisen*, reconstructed 1997 version of *Columeta* (1921/22). COURTESY OF CENTRE NATIONAL DE L'AUDIOVISUEL, LUXEMBOURG/ARCELORMITTAL.

production and is framed by scenes of Luxembourg and the sites of production at the beginning and scenes of the industry's welfare institutions at the end. See also Charles Barthel, "'COLUMETA' ('Vu Feier an Eisen'): L'aventure du premier film publicitaire de l'Arbed," *Hemecht* 50, no. 2 (1998): 177–206; Plein, "Beautiful Luxembourg, Steel Works, and a Swimming Pool."

10 For depictions of industrial workers' supervision, see also Alf Lüdtke, "Gesichter der Belegschaft: Portraits der Arbeit," in *Bilder von Krupp: Fotografie und Geschichte im Industriezeitalter*, ed. Klaus Tenfelde (Munich: C. H. Beck, 1994), 67–87.

and quasi-sublime modernity of the cathedrals of industrialization, where the worker's body only matters as a scale figure (see fig. 1.2a). The camera zooms in on the workers only when the light conditions or the surroundings require it, or if the production processes are shown in detail (see figs. 1.2b, 1.2c). The individual worker (skilled or unskilled) is presented as one among many elements of these production processes.[11] He is thus not a distinct motif of the film but presented as a functional part of the overarching industrial organism.

The medium of the "silent" film makes it possible to adapt the film's message to different audiences, highlighting different topics or motifs by, for instance, showing only parts of the film or using different commentaries.[12] A commentary's emphasis on the film's representation of the skilled trades, for example, could serve to promote vocational training. The prominent display of industrial trades at the trade fair could communicate the (skilled) workers' value and the economic and social advantages (supposedly) resulting from vocational training and a job in the steel industry.[13] At the fair, the visitors could also experience a work site (the mine replica), see the workers in action, and talk to them in person, which in turn fostered the workers' pride in their work. In this specific setting and context, the film *Columeta* could be profitably employed for

FIGURES 1.2A, 1.2B, AND 1.2C Frames from *Vu Feier an Eisen*, reconstructed 1997 version of *Columeta* (1921/22).
COURTESY OF CENTRE NATIONAL DE L'AUDIOVISUEL, LUXEMBOURG, AND ARCELORMITTAL.

11 The display of human work as subordinate to the machinery was a common practice of display in steel films of the time. See Uli Jung and Wolfgang Mühl-Benninghaus, "Ästhetischer Wandel: Dokumentarische Propagandafilme," in *Geschichte des dokumentarischen Films in Deutschland: Band I: Kaiserreich 1895–1918,* ed. Uli Jung and Martin Loiperdinger (Stuttgart: Reclam, 2005), 432–33.

12 Early cinema has never been silent but was accompanied by commentary or music (nor was it necessarily black and white, as is shown by the tinted sequences of the film *Columeta*); see, for example, Germain Lacasse, Vincent Bouchard, and Gwenn Scheppler, eds., *Pratiques orales du cinema: Textes choisis* (Paris: L'Harmattan, 2011).

13 For the relevance of sensory experience in vocational training, see Priem and Herman, "'Sensuous Geographies' in the 'Age of Steel.'"

the promotion of vocational training and the industry's recruiting interests.[14] In a different setting—if the audience, for instance, consisted of industrial customers—the emphasis could be put on the technological processes and the functioning of the industrial organism, which ensured the continuity of production and the high quality of the final products. *Columeta* was, after all, first and foremost a corporate propaganda film, produced to sell ARBED's products and popularize its distribution company, Columeta.[15]

The company's final products were also frequently presented through photographs published in printed brochures. Photography played a major role in the commercial presentation of product images, not least because of its quality of conveying a "naturalistic truth." This assumed and for a long time unchallenged authenticity of photographs as technically produced images made photography (and film) an ideal tool to "document" the production processes and products.[16] Workers were frequently included in product images. Apart from depicting a responsible and skilled workforce, the presentation of individual workers, whose poses convey a sense of importance and pride in belonging to and being photographed for modern industry, may have had another welcome side effect for the company: The publication of these images could support both the workers' sense of belonging and the recruiting needs of the industry.[17] Following Karin Priem and Frederik Herman's suggestion to take into account the physical and sensuous connectedness of humans and technology in industrial production, it could be argued that the display of workers together with their machines or products countered the Marxist perspective on industrial production as alienation and rather communicated

14 A German film that served the recruitment of workers much more explicitly was *Grube Cäcilie* (1917), where fictional scenes of a worker and his family framed the documentary sequences of surface mining and the production of coal briquettes. See Jung and Mühl-Benninghaus, "Ästhetischer Wandel," 432–33. Elevating the industry to national importance and depicting the industry's social works for the benefit of the working class in the film *Columeta* also supported the recruiting interests of the company. See Plein, "Beautiful Luxembourg, Steel Works and a Swimming Pool."

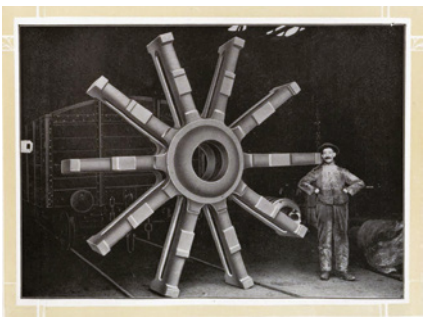
15 For further perspectives on the film's communicative capacities, such as the embedding of the steel industry into a wider national narrative or the company's corporate social responsibility initiatives, see Plein, "Beautiful Luxembourg, Steel Works and a Swimming Pool."

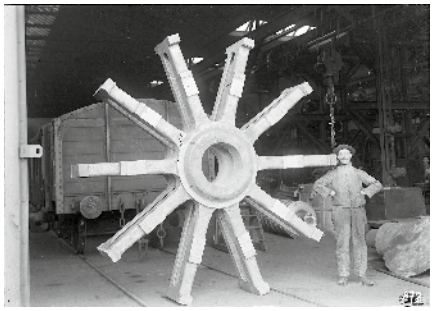
16 Photographs of industrial processes were not necessarily authentic. Insufficient lighting conditions, for example, often required manipulations such as, for example, the white-painting of iron to make it appear as glowing hot; see Ulrich Wengenroth, "Die Fotografie als Quelle der Arbeits- und Technikgeschichte," in Tenfelde, *Bilder von Krupp*, 96.

17 Workers posing next to their machines had been a popular postcard motif since ca. 1900. See Hermann and Plein, "Envisioning the Industrial Present," 12–13.

a (positive) link of man and machine, which contributed to the perception of technological innovation as a beneficial value for society.[18]

However, the argument made by art historian Paul Brandt in 1928—that the "representative" industrial paintings at the turn of the century emphasized not so much human labor but the "bold inventive spirit of the engineers, who had established the industrial facilities" and that the figure of the worker only mattered as "mass and scale"—to some extent also applies to the photographic self-presentation of the Luxembourgian steel company ARBED.[19] Most images published by the steel industry had the primary function of corporate promotion, with workers merely serving to indicate the scale of the industrial equipment and environment. A corporate brochure from the early 1920s contains images of the company's steel plants, production sites, and final products, sometimes with, sometimes without workers.[20] An image on page 24 of the brochure shows the final product of "armature steel casting" (see fig. 1.3a). The placement of a worker—whose posture surely bespeaks a certain pride in being photographed—next to the armature illustrates the dimensions of the product. The main emphasis of the image becomes clear by comparing the brochure and the original glass plate negative (see fig. 1.3b). For the publication, the photograph was retouched: The background is darkened and harmonized; the armature itself is carefully retouched, the contours and curves are emphasized and shadowed. All alterations serve to make the presentation of





FIGURES 1.3A Spread from *Columeta: Comptoir métallurgique luxembourgeois* (ca. 1922), 24.
1.3B "Amature steel casting." Undated. Digital positive from glass plate negative. © INSTITUT EMILE METZ. CNA COLLECTION.

18 See Priem and Herman, "'Sensuous Geographies in the 'Age of Steel.'"
19 Paul Brandt, *Schaffende Arbeit und Bildende Kunst: Vom Mittelalter bis zur Gegenwart* (Leipzig: Alfred Kröner Verlag, 1928), 332. "Mass" here is used in the sense of large numbers of people.
20 *Columeta: Comptoir métallurgique luxembourgeois* (Liège: Bénard, s.d. [ca. 1922]).

the high-quality product more brilliant. Only the worker is not altered. In fact, he is the only element in the picture that still communicates the "naturalistic truth" of photography. Thus, the worker's figure accentuates the product in two ways: First, he gives an idea of the product's dimensions; and, second, he supports the image's perception as an "authentic" photograph, even though the image has been extensively retouched. Nevertheless, the presence of the worker—and the absence of any production machinery, whether by accident or design—also reveals the role that human labor plays in the production process. The actual visibility of the worker is an acknowledgment of the worker's importance and adds to his self-image, pride, and sense of belonging.

3 The Worker's Body as Representation of the Industry

A much more explicit acknowledgment of the worker's importance and value was communicated in representative works of art, where the worker's body was employed in allegorical depictions of the industry. At the 1937 World Fair in Paris, where the steel industry played a key role in Luxembourg's self-presentation, a wall frieze by Jean Schaack, illustrating the country's regions, sports activities, touristic attractions, and economic sectors, such as agriculture and industry, decorated the restaurant of the Luxembourg Pavilion.[21] The (steel) industry is represented by elements of the industrial organism: stylized blast furnaces, hoisting cranes, billowing steam, red hot liquid iron, a large gearwheel, and the dominant figure of the worker (see fig. 1.4). He is featured as a masculine and proud figure, holding a hammer. While the worker is part of an industrial environment, he is not shown during the act of working, but as the heroic master of the scene. The worker's strong physique obscures the negative effects of industrial work, such as exhaustion, weakness, and physical and mental fatigue, and instead communicates the worker's strength and pride. It is a heroic idealization of the worker; mastering both the machinery and the elements, he is presented as a representative of the entire industrial sector.

Another heroic version of the worker was prominently displayed in a series of bas-reliefs by Auguste Trémont on the exterior wall of the Luxembourg pavilion. Besides several scenes depicting industrial work, three allegorical personifications of the industry were positioned to the left of the entrance,

21 See Jean-Luc Mousset and Ulrike Degen, "Paris 1937," in *Un petit parmi les grands: Le Luxembourg aux Expositions universelles de Londre à Shanghai (1851–2010)*, ed. Jean-Luc Mousset and Ulrike Degen (Luxembourg: Musée national d'histoire et d'art, 2010), 189–205; Plein, "Beautiful Luxembourg, Steel Works, and a Swimming Pool."

FIGURE 1.4
Design by Jean Schaack for an element of the frieze of the Luxembourg Pavilion restaurant at the Paris World Exhibition, 1937. Gouache on paper.
COURTESY OF MUSÉE NATIONAL D'HISTOIRE ET D'ART, LUXEMBOURG.

facing personifications of agriculture to the door's right. Four such personifications were reprinted in the catalogue (see fig. 1.5).[22] While agriculture is presented as a graceful female figure (in the tradition of female allegories), industry is personified by muscular and self-assured male figures. Drawing on the pictorial tradition of the heroic worker as blacksmith, which Schaack had also employed for the allegorical wall frieze, Trémont too used the convention of the heroic worker but divided the field of industrial work into the distinct trades involved in the process of steel-making.[23] The steel industry is represented by three figures whose clothes and attributes signify the miner, the mill train worker, and the smelter, communicating the variety and value of different skills and trades within the industrial organism. Placed outside an industrial environment (and omitting any references to the risks and dangers of industrial work), the reliefs present the industrial workers' male bodies as the embodiment of productivity, power, and strength.[24] By literally carving the (skilled) worker in stone, the reliefs communicated his importance and value for the industry and thus for the nation's wealth and prosperity to the visitors of the World Fair and—through publication in the catalogue and photographs in the illustrated press—to a broader Luxembourg audience.

22 *Le Grand Duché de Luxembourg à l'Exposition Internationale de Paris 1937* (Luxembourg: Commissariat général du gouvernement luxembourgeois, 1937). Photographs of the pavilion were also published in the illustrated magazine *A–Z: Luxemburger illustrierte Wochenschrift*, August 8, 1937, 4–5.

23 The pictorial tradition of the blacksmith who is fighting and domesticating the elements is drawing on the Greek and Roman myths of Hephaistos and Vulcan, respectively. See, for instance, Klaus Türk and Manfred Jablonski, "Hüttenarbeiterskulpturen im öffentlichen Raum des 19. und 20. Jahrhunderts," in *150 Jahre Stahlinstitut VDEh 1860–2010*, ed. Helmut Maier, Manfred Rasch, and Andreas Zilt (Essen: Klartext Verlag, 2010), 576; see also Klaus Türk, *Bilder der Arbeit: Eine ikonografische Anthologie* (Wiesbaden: VS Verlag für Sozialwissenschaften, 2000), 78–81.

24 See also Türk and Jablonski, "Hüttenarbeiterskulpturen im öffentlichen Raum des 19. und 20. Jahrhunderts," 576.

FIGURE 1.5 Worker reliefs by Auguste Trémont and Lucien Wercollier on the Luxembourg Pavilion, Paris World Exhibition, 1937. Reprinted from *Le Grand Duché de Luxembourg à l'Exposition Internationale de Paris 1937*, 21.

Auguste Trémont had used the figure of the industrial worker in representative artworks before and had, in fact, helped shape the image of the industrial worker since World War I. Trémont had interrupted his education at the École national des beaux arts in Paris to spend the war years in Luxembourg, where he was employed as a technical draftsman at the steelworks in Dudelange.[25] In his leisure time, he was allowed to take sketches of the plant's interior and of the workers, which he frequently re-used for other assignments in later years. Trémont had already exhibited paintings of industrial workers in the 1916 Luxembourg Salon du Cercle Artistique.[26] His painting *La coulée de fonte* (Iron casting) shows a pair of steelworkers at work (see fig. 1.6). While the title refers to the depicted production process, it is the workers who are at the center of the image and highlighted by the white steam in the background. In the painting, it is not the machinery but first and foremost the physical strength and the concentrated work of the men that is presented as central to the process of iron making.

25 See Georges Schmitt, *Auguste Trémont* (Luxembourg: Section des Arts et Lettres de l'Institut Grand-Ducal, 1980), 9–11.

26 In 1916, Trémont had also created a triptych with motifs of industrial work(ers) for the mess hall at the Dudelange plant; see ibid.

FIGURE 1.6
Auguste Trémont, *La coulée de fonte* (Iron casting), 1916. Oil on canvas. 61 x 75 cm. COURTESY OF MUSÉE NATIONAL D'HISTOIRE ET D'ART, LUXEMBOURG.

Again drawing on his earlier sketches, Trémont also decorated the entrance of the Luxembourg Pavilion at the 1935 World Fair in Brussels. Here, the industrial worker was depicted in a very different manner: A pillar shows a multitude of miners and steel workers who are performing their tasks in an industrial landscape, while an outsized worker's figure dominates the scene. In the pose of Rodin's *The Thinker*, he is depicted as an individualized and thoughtful representative of the working class and the industry (see figs. 1.7a, 1.7b).

The worker with the impressive physique—who we know today was the steel worker Mathias Gaasch from Dudelange—seems to have been Trémont's favorite model. He is depicted in many of Trémont's artworks, which were used in a variety of media—on a book cover, on ARBED's certificates of honor, and on the one- and two-franc coins that were in use between 1924 and 1991—thus circulating the image of the heroic worker in Luxembourg for decades.[27] Besides his physique, Mathias Gaasch thus provided a familiar face to a wide variety of visual representations of industrial work. The display of individual workers in art offered a space for recognition and, more importantly, for subjective identification with the worker.

While neither drawing, painting, nor sculpture can be considered mass media, they were part of the extensive circulation of the motif of the industrial worker in Luxembourg—through coins, book illustrations, or photographs in newspaper articles and brochures. Although they lacked photography's "naturalistic truth," painting and sculpture communicated an increased esteem for industrial work in Luxembourg society. To a Luxembourg audience, all of these

27 See René Link, "La sidérurgie sur timbres et billets de banque/Steelmaking Depicted on Postage Stamps and Banknotes," in *La sidérurgie luxembourgoise: Un siècle d'histoire et d'innovation/Steelmaking in Luxembourg: A Century of History and Innovation*, ed. ArcelorMittal (Luxembourg: ArcelorMittal, 2011), 29–31. The book cover, where the figure is presented in the context of war, is reprinted in *Auguste Trémont: Der Künstler, der die Tiere liebte*, ed. Nic Weber (Luxemburg: Éd. des Cahiers luxembourgeois, 1993), 127.

FIGURES 1.7A Detail of a photograph depicting the entrance to the Luxembourg Pavilion at the Brussels World Exhibition, 1935. Reprinted from *Le Grand-Duché de Luxembourg à l'Exposition Internationale de Paris 1937*, 207.

1.7B Drawing by Auguste Trémont, ca. 1916. 75 x 55 cm. Reprinted from Schmitt, *Auguste Trémont*, 72.

visual representations demonstrated the industrial worker's (inter-)national appreciation and thus enhanced the reputation of the entire working class. The circulation of heroic images of the worker in a variety of media contributed to the public discourse on industrial work, communicating and acknowledging the workers' self-confidence and fostering the belief in economic progress for the benefit of all.

4 Proletarian Perspectives on the Worker's Body and the Industrial Organism

The depictions from the mid-1930s also testify to the enhanced status of industrial work at a time when the labor unions were able to achieve unprecedented success and recognition. In Luxembourg, the labor movement evolved rather late; the mining and steel unions were founded only during the First World War.[28] After an unsuccessful strike in 1921 and a subsequent decline in membership, it took several years for the unions to recover and gain (new) force.[29] During the Great Depression of the 1930s, a wage increase and the union's

28 See Fréderik Krier et al., eds., *100 Joer fräi Gewerkschaften 1916–2016* (Esch-sur-Alzette: OGBL/Éditions Le Phare, 2016), published on the occasion of the centenary of the free labor unions in Luxembourg.

29 See Denis Scuto, "De la grande grève de mars 1929 à l'intégration dans la nation: Les syndicats libres dans l'entre-deux-guerres," in Krier et al., *100 Joer fräi Gewerkschaften*, 71.

official political recognition were the two main objectives of the unions' struggle.[30] In 1936, one year before the Paris World Fair, a mass demonstration of labor unions forced the government to install a Conseil National du Travail (National Council of Work), where representatives of employers and unions were appointed to find solutions for labor disputes under the auspices of the government, eventually leading to the first collective bargaining agreements in Luxembourg.[31]

The call for workers' political participation and unity also found expression in the visual media that were used to highlight the working conditions and the economic insecurity of the working class as well as the need to close ranks and show a united front. In the early 1930s, the illustrated book *Der tägliche Weg* (The daily way [to work]) provided a proletarian perspective on workers' lives during the crisis.[32] The book contained linocuts by the artist Albert Kaiser, a former mining and steel worker who was active in the labor union's educational initiatives and hence clearly fired by a political agenda. Presenting the flipside of industrial work, Kaiser's work took a clear stand and illustrated the need for the political participation of the working class. Depicting the workers' precarious living and working conditions, Kaiser often contrasted them with the living conditions of the rich or pointed to the causes of the workers' plight. Both the text and the images in *Der tägliche Weg* can be understood as a plea to the labor movement to achieve unity in order to gain political weight and power.[33]

One of his linocuts presents workers at the site of production (see fig. 1.8). In the lower section, two workers carry out their tasks on an assembly line. They are isolated from each other and literally chained to their monotonous activity. The clock determines the pace and the rhythm of work. A smaller figure inside a gearwheel that is directly linked to the clock is running like in a treadwheel. The transmission belts physically limit the workers' freedom of movement, their hands are literally tied to the horizontal rods and thus make the worker a part of the machinery; the postures of the workers express fatigue and resignation. The image communicates the negative, structural effects of the capitalist system on the worker, his body and his soul. The worker is presented as a

30 Ibid.

31 Ibid., 75.

32 See *Der tägliche Weg: Reportage aus Arbeiterzügen von Ex. mit Linolschnitten von A. K.* (Esch-sur-Alzette: Luxemburger Genossenschaftsdruckerei, 1932). Before the book's publication, many of the linocuts were published in the leftist newspaper *Escher Tageblatt*; see Ira Plein, "'Der tägliche Weg zur Schicht': Aspekte zur proletarischen Kunst Albert Kaisers in der Zwischenkriegszeit," in Krier et al., *100 Joer fräi Gewerkschaften*, 93.

33 Ibid., 83–97.

FIGURE 1.8 Linocut by Albert Kaiser. Reprinted from *Der tägliche Weg* (1932), 28.

small cog in the wheel of industry and thus—as postulated by Marx—part of the capitalists' property. Here, too, the worker is part of the industrial organism, but the image does not convey pride and a sense of belonging. Rather, the workers are pictured in chains and subordinated to the industrial machinery that is part of the capitalist economic system. The physique of the workers is executed in a particularly crude way: the faces look like masks and the hands like robotic tools. The class differences are visualized by the antagonistic display of the body of "the capitalist." The bulky physique of the entrepreneur in the upper section, which is contrasted to the fatigued and chained bodies of the workers, affirms the class divide. Seen from this politically motivated proletarian perspective, being a part of the industrial organism means subordination and the loss of humanity. Preventing any kind of identification with the depicted individuals, the highly stylized and anonymized figures of the workers instead support their perception as representatives of the working class. Nevertheless, these works, too, claim authenticity, as they present an insider's perspective on the reality of industrial working conditions in the capitalist system. This very different perspective on the societal "truth" countered the images of workers as being part, or representative, of a healthy industrial organism in order to visualize and bring forward an argument for political action.

A proletarian standpoint was also expressed in the medium of photography—even using the modernist technique of photomontage, which is explicitly pointing up the deliberate (re)construction of reality.[34] In January 1934, the illustrated magazine *A–Z* published a full-page photomontage depicting a worker outside of the factory, reading a newspaper on the streets in a bourgeois urban setting (see fig. 1.9). The blast furnaces are present even here; they are softly mounted into the background, but become more distinctly visible in the sky, from where they dominate the scene. The fact that no smoke comes out of the chimneys points to the economic crisis, as does the title of the photomontage: "*Arbeitslos… wie lange noch…?*" (Unemployed… for how much longer…?). The question reflects the worker's feeling of helplessness, his inability to actively change his situation. He can only wait and check the newspaper for job advertisements. This scene does not present the worker as part of the larger industrial organism, nor as a heroic industrial worker. Quite the opposite. Here,

34 The role of photography for proletarian (self-)presentation begs further research. A catalogue of the National Photography Exhibition of 1935, organized by the Union Photographique Esch-sur-Alzette, lists titles that indicate the display of industrial motifs, ranging from factory views to clearly defined processes of steel-making. However, the majority of the exhibited photographs carried titles that imply rather bourgeois motifs and topics (for example, idyllic landscapes, flowers or cultural heritage sights); see *3ième Salon nationale de la photographie* (Esch-sur-Alzette: Union Photographique, 1935).

FIGURE 1.9
"*Arbeitslos... wie lange noch...?*" (Unemployed... for how much longer ...?). Photomontage. Reprinted from *A–Z: Luxemburger illustrierte Wochenschrift*, January 7, 1934, 5.

FIGURE 1.10
Linocut by Albert Kaiser. Reprinted from *Escher Tageblatt*, May 1, 1931, cover page.

the viewer sees an uneasy and lean worker who has been expelled from the industrial organism. The image does not explicitly name the problems that the worker is facing, but a working-class reader would know.

The need to close ranks and fight for the interests of the working class was, of course, a main message of the labor movement. For the May 1, 1931, issue of the leftist newspaper *Escher Tageblatt*, Albert Kaiser created a linocut that depicts the labor movement as a massive but peaceful force (see fig. 1.10). A huge number of workers is marching under the banner of the free unions, guided by a (suit- and tie-wearing) leader. The industrial site is visible only in the far background. The masses of workers (and employees) leave the plant to celebrate Labor Day. The working class is represented not by a single person or a few stylized figures but by anonymous bodies of workers. In addition, the linocut shows not only male workers but also children and women and makes no distinction between factory and office workers. To inspire workers and employees to action—in the interests of and for the benefit of the working class as a whole—anonymous masses of stylized bodies were used to create a sense of community and to illustrate (and advocate) the strength of a mass movement.

5 Conclusion

Images of industrial work(ers) were deployed by various actors in interwar Luxembourg society. The different images testify to a lively debate on industrial work at the economic, social, and political levels. Looking at visual representations of industrial work(ers) as contributions to a public discourse provides further evidence of the competing political positions at the time but also opens up new perspectives on the communicative capacity of images and media presentations in Luxembourg. The variety of visual representations in different media and imaging technologies all contributed to a public discourse on industrial work, drawing on capitalist, philanthropist, nationalist, and Marxist ideas and metaphors.

According to Pierre Bourdieu, positions are continuously rearranged within a dynamic social space as a result of the struggle for distinction and participation.[35] In the case of images, too, the question of power and societal control over the discourse is essential, since, according to Michel Foucault, "in every society, the production of discourse is at once controlled, selected, organised and redistributed."[36] Images show certain aspects and exclude others, in order to emphasize a certain topic or perspective, or to propagate a certain mindset. Sociologist Klaus Türk has stated that images of work inevitably have a political tendency, as depictions of work always comment on contemporary conceptions of work—either interpreting, reflecting on, white-washing, supporting or contradicting the prevailing views of the time.[37] As such, images of work are reflections and co-producers of social constructions and "politics of truth" that express the arguments and agendas of the artist, the client, or the publisher.[38] Authorship, technology, and the context of publication or display greatly influence the value and power of visual "argumentation"—both in terms of the addressed audience(s) and the broader public discourse.[39] Photography

35 See Pierre Bourdieu, "The Social Space and the Genesis of Groups," *Theory and Society* 14, no. 6. (1985): 723–44.

36 Michel Foucault, "The Order of Discourse," in *Untying the Text: A Poststructuralist Reader*, ed. Robert Young (Boston: Routledge, 1981), 52.

37 Klaus Türk, "Arbeit in der bildenden Kunst," in *Anthropologie der Arbeit*, ed. Ulrich Bröckling and Eva Horn (Tübingen: Gunter Narr Verlag, 2002), 37.

38 Ibid. Klaus Türk has done fundamental research on images of work, see Türk, *Bilder der Arbeit*.

39 See, for example, Abigail Solomon-Godeau, "Who Is Speaking Thus? Some Questions about Documentary Photography," in *Photography at the Dock: Essays on Photographic History, Institutions, and Practises* (Minneapolis: University of Minnesota Press, 1991), 169–83.

must capture "the *necessarily* real thing which has been placed before the lens,"[40] while painting, the graphic arts, and sculpture are widely understood as a willed construction of the motif and as a synthesis of the author's subjective perspective, which is influenced by his/her cultural, social, and intellectual background.[41] Yet as much as the fine arts can claim authenticity and validity for being a (condensed) representation of the truth, photography too is capable of representing ideas and conceptions beyond the depicted motif.[42] Roland Barthes has pointed both to the "truth of the image, the reality of its origin," and to its potential for deception and delusion by the systematic arrangement and embedding of photographs into specific contexts.[43]

As the presented examples show, authorship matters, but the technologies and contexts of display are just as important. The medium of photography, which was considered state of the art for truthful "documentation," left room for different presentations and perceptions of that which was depicted. As part of the steel industry's self-representation, which was accomplished predominantly through photography, the worker's figure served different objectives, which ranged from promoting the industry's commercial products to serving its recruitment purposes. Photograph captions or film commentaries, which could be adapted to different audiences, determined the images' meaning and reception. Presenting the heroic figure of the worker as a motif in the prestigious fine arts, such as painting or sculpture, contributed to enhancing the social recognition and perception of the worker. The context of display, too, gave meaning to the motifs: At the World Fairs, for example, it elevated the industry, the industrial worker, and thus the working class to national importance in times of increasing political participation. Before that, the political left in Luxembourg had presented proletarian perspectives on industrial work(ers) in the popular media; by pointing to the physical and psychological hazards of industrial production and promoting solidarity and collective political action,

40 Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Hill and Wang, 1981), 76.

41 See Ernst H. Gombrich, *Art and Illusion* (New York: Phaidon Press, 2012), 55–78.

42 See Türk, "Arbeit in der bildenden Kunst," 35. Daston and Galison have shown that there is no such thing as objectivity in any media or technique, and that the concept of objectivity is changing over time; see Lorraine Daston and Peter Gallison, *Objectivity* (New York: Zone Books, 2007).

43 Barthes, *Camera Lucida*, 77–79, quotation on 77. For the influence of context and forms of display on the perception of photographs, see also his article on the exhibition "The Family of Man": Roland Barthes, "The Great Family of Man," in *Mythologies*, trans. Annette Lavers (London: Vintage, 2000), 100–102.

these images were intended to support the labor movement's fight for political influence and participation.

The diversity of images of industrial workers—depicted as masses, as means to show the scale of industrial products or machinery, as machine-like robots, or (often simultaneously) as representatives or metaphors for an abstract concept—reflected, and reflected on, the conflicting perspectives on the societal status of industrial work in interwar Luxembourg. The diverging images, genres, and media interacted and referred to each other, building on or contradicting other views circulating at the time. As the art historian Ernst Gombrich has shown, the perception of images is not least determined by the mindsets and expectations of the viewers.[44] It is, in fact, this very struggle for people's mindsets that can be traced by looking at the visual media in Luxembourg. Each group employed the figure of the industrial worker for its own ends and drafted it into the service of its ideas and perspectives on industrial work. Suggesting specific ways of seeing, the images contributed to the perception and meaning-making of industrial work(ers) at the time and, from today's perspective, are evidence of a heterogeneous and competitive debate on the working class in interwar Luxembourg.

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44 According to Gombrich, there are certain learned conventions—or mindsets—that define one's subjective perception and the representation of reality. Gombrich argues that human beings, when looking at images, are constantly searching for meaning and that perceptions are continually "integrated" until they make sense. Images therefore can be understood as visual suggestions for meaning-making, which build on the existing mindsets of the viewers and adapt to their subjective expectations. See Gombrich, *Art and Illusion,* 55–78; Ernst H. Gombrich, "Bild und Kode: Die Rolle der Konvention in der bildlichen Darstellung und Wahrnehmung," in *Bild und Auge: Neue Studien zur Psychologie der bildlichen Darstellung* (Stuttgart: Klett-Cotta, 1984), 285.

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CHAPTER 2

Photography as a Space for Constructing Subjectivities: Luxembourg's Steel Dynasties and the Modern Workforce as Seen through the Glass Plate Negatives from the Institut Emile Metz

Françoise Poos

1 Introduction

The Institut Emile Metz was founded in 1913 in Dommeldange, a suburb of the city of Luxembourg, by Caroline Rosalie Laure Edmée Metz-Tesch, the wealthy widow of Emile Metz, one of Luxembourg's leading industrialists.[1] The Luxembourg publisher and writer Jules Mersch described her as the epitome of the Belle Epoque: as a young woman, she would be richly powdered and elegantly dressed, a stylish umbrella perfectly matching her gown, when she rode to town in her open carriage.[2] Her taste was exquisite and refined. As a well-educated member of the upper bourgeoisie, Edmée Metz-Tesch liked to shop at exclusive places: bills from her personal archive show her as a customer of Hellstern & Sons, a famous store for bespoke fashion on Place Vendôme in Paris.[3]

1 Emile Metz (1835–1904) was the eldest son of the Luxembourg politician and industrialist Norbert Metz. He succeeded his father as the manager of Metz and Company and as administrator of the Société des Hauts Fourneaux de Dudelange. In 1886, he was appointed general manager of the Usines d'Esch. Importantly, he was also the first to acquire, in April 1879, an independent license for the exploitation of the process of dephosphorizing lower quality iron ore, which was invented and elaborated between 1874 and 1878 by Sidney Thomas and Percy Gilchrist, and thus made steel production in Luxembourg possible. Until then, the iron ore found in the country, because of its high concentration of phosphorus, only allowed the production of cast iron. The license that Emile Metz acquired represented therefore a pivotal moment in the history of Luxembourg steel making. See also Jos[eph] Wagner and Camille Aschman, "Fondateurs d'usines, maîtres de forges et grands maîtres de l'industrie sidérurgique luxembourgeoise," *Revue Technique Luxembourgeoise* 29, no. 6 (November–December 1937): 133–52.

2 See Jules Mersch, "Les Metz, la Dynastie du Fer," in *Biographie nationale du pays de Luxembourg*, vol. 6, fascicule 12 (Luxembourg City: Bourg Bourger, 1963), 383.

3 See Jean Lamesch, "Histoire de la Fondation Veuve Emile Metz-Tesch," in *IEM–LTPEM: 100 Joer, 1914–2014*, ed. Alphonse Bressanutti, Fernand Champagne, Laurent Kemp, Siggy Kirsch, Pierre Legille, and René Tissier (Luxembourg: LTPEM, 2015), 70.

Her lavishly decorated hats came from a renowned milliner in Brussels. She also appreciated the inventions and comforts of modernity: She had a driver's license and had installed in her residence a phone as well as boilers that made possible more regular and continuous heating than the traditional fireplaces.[4]

Most striking, however, was her reading list. Among her bills, Luxembourg scholar Jean Lamesch discovered an order from a bookstore in Brussels featuring the *Memoirs* of Casanova and Mirabeau's *Lettres à Julie* (Letters to Julie), as well as a copy of Marc de Villiers' *Histoire des clubs de femmes et des legions d'Amazones* (*1793*) (History of women's clubs and Amazon legions), conveying progressive ideas on marriage, divorce, and female education. Edmée Metz-Tesch also read Madame de Gaffigny's epistolary novel *Lettres d'une Péruvienne* (*1747*) (Letters from a Peruvian woman), promoting the idea of the "noble savage," and the writings of Anatole France, the French Academician and winner of the 1921 Nobel Prize for Literature, who was active in the social and political issues of his time.[5] Judging from the material objects that accompanied her life, Edmée Metz-Tesch thus appears as a modern, independent, and open-minded woman, with a keen interest in the betterment of society. This commitment translated, tangibly, into the creation of the Institut Emile Metz.

The idea for a vocational school in honor of her husband's memory was originally suggested to her by Emile Bian, director of the Dommeldange steel plant from 1900 until 1911. The idea appealed to her from the start, but it seems that Edmée Metz-Tesch had grander visions on how to contribute to the growth of the industry than merely training a largely unqualified workforce. Metz-Tesch instead conceived of a technological institute, with state-of-the-art facilities, bright, well-lit classrooms, clean workshops, a gym, even an indoor pool, to which would later be added a psychophysiological laboratory where the students' skills and capacities were to be tested and developed. According to an official publication listing and describing ARBED's corporate welfare initiatives, her declared aims were, "To better the fate of the worker. To raise his physical and intellectual capacities. To awaken latent intelligencies."[6] "Of high lineage and a strong individualistic streak," noted the same publication, "the daughter of Minister Victor Tesch was particularly well prepared to understand the part of contingency in happiness, and to conceive happiness as the emanation of one's personality."[7] The development of individuality and the

4 Ibid.

5 Ibid., 72–73.

6 ARBED, *Œuvres sociales* (Luxembourg: Victor Bück, 1922), 41. Unless otherwise noted, all translations are the author's.

7 Ibid.

achievement of personal fulfilment thus were important concerns in the creation of the Institut Emile Metz.

Whether these aims have been truly met is a question that transcends the scope of this paper, and a detailed analysis of the corporate discourse surrounding the Institut Emile Metz and its impact on the workforce still needs to be written. In popular texts, however, the new training institute established by Edmée Metz-Tesch was generally seen as a ladder of upward social mobility, and its progressive teaching methods were discussed at international conferences on reform education.[8] Moreover, the architectural design of the school seemed to be the visible manifestation of the generous vision of its benefactress: entirely made of cut stone, the building testified to stateliness and stability, while the sturdy columns adorning the front entrance conveyed an image of monumentality and continuity.[9] The teaching facilities, the classrooms, the dressing and locker rooms, and the workshop spaces corresponded to progressive norms of hygiene and were designed to create a positive learning environment.

Not surprisingly, the Institut Emile Metz was presented as a showcase of the company's corporate welfare initiatives in the field of education.[10] As such, it was abundantly documented not only through texts but also through photographs, including carefully crafted views of the institute's interior and exterior spaces and adjacent workshops, class pictures, and images of the school's own Boy Scout troop, Les Loups Blancs, founded in 1914. These images and many more resurfaced in 2007, when a group of alumni discovered a collection of about 2,400 glass plates in the school's attic, where they had been abandoned and eventually forgotten. The plates had been made between 1913 and 1962, starting with images of the construction of the institute and ending with the

8 See Lise Linster, "Das Institut Emile Metz – eine Stufe zum sozialen Aufstieg," *Koplescht, fréier an hott* 10 (October 2013): 56–62; Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 592–614; Frederik Herman, Karin Priem, and Geert Thyssen, "Körper_Maschinen? Die Verschmelzung von Mensch und Technik in Pädagogik, Industrie und Wissenschaft," *Jahrbuch für Historische Bildungsforschung* 20 (2014): 47–75.

9 Lamesch, "Histoire de La Fondation Veuve Emile Metz-Tesch," 71–72.

10 For the company's own early representations of the Institut Emile Metz, see, for instance, ARBED, *Œuvres sociales*; *Institut Emile Metz: Programme publié à la clôture de l'année 1917–1918* (Luxembourg: Imprimerie Universelle Linden et Hansen, 1918); Jean-Pierre Arend, "L'Evolution de l'Institut Emile Metz et l'atelier d'apprentissage," in *Institut Emile Metz: Programme publié à la clôture de l'année scolaire 1920–1921* (Luxembourg: Imprimerie Th. Schroell, 1921), 55–64.

documentation of a flood in Dommeldange. The boxes had been meticulously annotated, but their order had not been preserved over time, and they arrived at Luxembourg's Centre national de l'audiovisuel (CNA) as a seemingly disparate ensemble, including motifs and subjects as diverse as school life and educational records, industrial products, construction sites, the steel plant, commemorations and gatherings, as well as portraits of directors, workers, and employees. By covering such a variety of subjects, the glass plates give insight into the lived history not only of the school but of the entire corporation, while also testifying to the role of photography in consolidating the corporate image of ARBED both in Luxembourg and abroad.

The glass plate holding can be approached from many different perspectives. However, in keeping with the thematic focus of this publication on "the body in education," this article explores how the glass plates found at the Institut Emile Metz visually formed the subjectivities of both the workers and captains of the steel industry, but also—using the example of Edmée Metz-Tesch—of the industry's leading women. These investigations led me to consider photography as a space for constructing visions of embodied subjectivities. Photographs are multi-layered, complex objects, deeply entangled with and embedded in the everyday lives of their makers and users. This article, therefore, needs to been seen in the wider context of investigations about how photographs, as image surfaces and material objects, shape the way we see and understand the world. In the specific context of this publication on the intersection of photography and industry, I propose to analyze how photography as a medium was instrumental in shaping and disseminating the public image of the steel industry in Luxembourg, and how photographs helped form the public perception and understanding of this corporate hierarchical universe.

The historical timeframe for my exploration is the advent of modernity in Luxembourg in the first half of the twentieth century, a time of rapid industrialization and profound societal change. The "worker" as a type or a trope had barely appeared on the national horizon, in a country that had been largely agrarian until the consolidation of the steel industry in 1911 with the creation of the conglomerate ARBED (Aciéries réunies de Burbach-Eich-Dudelange). The workforce necessary for the success of the undertaking had yet to be produced, hence the creation of schools such as the Institut Emile Metz. Moreover, these newly created subjects and subjectivities also needed to be governed and managed in novel ways by the founders, directors, and managers of the steel industry. Their wives, though often working in the background, were active in the creation of social welfare or cultural initiatives and thus also played an important role in the formation of the modern workforce.

2 A Few Notes on the Theoretical Framework

This article is built around two main theoretical concepts: the idea of photographs as material objects entangled in the lived history of their makers and users; and the notion of the subjective body, or the construction of subjectivities. For a contemporary definition of subjectivity, I draw on the work of American cultural historian Michael O'Mally who argues that subjectivity is the "sense of self" resulting from the subjection of the self to a set of external influences and power relations. "Subjectivity," he writes, "implies not just the individual's sense of self, but the ways that sense of self is acted on and even made up by outside forces."[11] The outside forces that I want to consider in this context are the development of the steel industry in Luxembourg and photography as a means of making visible the various new subjectivities in the modern age.

The French philosopher Michel Foucault has been influential in shaping my understanding of how people can be governed through "a certain policy of the body, a certain way of rendering the group of men docile and useful."[12] As a mass medium of visual representation, photography, I want to argue, was part of this modern way of managing subjectivities in the age of mass production. Indeed, in the words of art critic Jonathan Crary,

> Within this new field of serially produced objects, the most significant, in terms of their social and cultural impact, were photography and a host of related techniques for the industrialization of image making. The photograph becomes a central element not only in a new commodity economy but in the reshaping of an entire territory on which signs and images … circulate and proliferate. … Photography and money become homologous forms of social power in the nineteenth century. They are equally totalizing systems for binding and unifying all subjects within a single global network of valuation and desire.[13]

The most obvious manifestation of the power of photographs resides in their visual surfaces. In that sense, the glass plate collection from the Institut Emile

11 Michael O'Mally, "'Subjectivity'—What Is It?," *The Aporetic*, http://theaporetic.com/?page_id=2184.

12 Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (London: Allen Lane, 1977), 305. In his book, Foucault specifically discussed the disciplinary effect of Jeremy Bentham's *Panopticon*, which made it possible to observe the prisoners' every movement, continually exposing them to an outside observer.

13 Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 2005), 13.

Metz is an enticing selection with compelling motifs and attractive compositions. However, a semiotic analysis focusing on image content alone does not yield much information about the meaning of these photographic objects. I therefore propose to look at the glass plates "beyond the visual" and to consider them as material objects with active agency in this "global network of valuation and desire."[14] The photographs under scrutiny thus need to be seen as "objects to think with," to borrow a phrase coined by visual anthropologist Elizabeth Edwards.[15] As working tools and "bundled objects,"[16] they are deeply embedded and entangled in a complex and multi-layered meshwork of social relations and performances.[17] As such, they give insight into the lived history of the steel industry in Luxembourg, and the wishes and projections of its steel barons as the country entered modernity.

3 The Glass Plate Negatives from the Institut Emile Metz

In Luxembourg, as elsewhere, industrialization was synonymous with change: lifestyles changed, and so, importantly, did work rhythms, working hours, and work ethics. With so many profound transformations affecting the whole country, it was important for the corporation to communicate about itself, both internally and externally. The glass plates found at the Institut Emile Metz can therefore be seen as part of a larger photographic archive of ARBED constructed within the discursive space of corporate communications. Indeed, the company's headquarters and various plants regularly documented their activities through photographs. These images were made to propagate a positive image of the corporation, both to its own workers and employees and to the

14 Elizabeth Edwards, "Thinking Photography Beyond the Visual?," in *Photography: Theoretical Snapshots,* ed. J. J. Long, Andrea Noble, and Edward Welch (London: Routledge, 2006), 31–48; Elizabeth Edwards, "Photography and the Material Performance of the Past," *History and Theory* 48, no. 4 (2009): 130–50; Gillian Rose, *Visual Methodologies: An Introduction to the Interpretation of Visual Materials*, 2nd ed. (London: Sage, 2007).

15 Edwards, "Photography and the Material Performance of the Past," 131.

16 Elizabeth Edwards, "Photographs and History: Emotion and Materiality," in *Museum Materialities: Objects, Engagements, Interpretations*, ed. Sandra H. Dudley (London: Routledge, 2010), Kindle edition.

17 Françoise Poos, "The Making of a National Audio-Visual Archive: The CNA and the Hidden Images Exhibition" (PhD diss., De Montfort University, 2016). For the idea of objects as part of organic ecologies or wider meshworks of bindings and gatherings of lines, see Tim Ingold, *Lines: A Brief History* (London: Routledge, 2007); Tim Ingold, "Bindings against Boundaries: Entanglements of Life in an Open World," *Environment and Planning A* 40, no. 8 (2008): 1796–1810.

outside world. There is thus an ideological component inherent in this communication, as cultural historian David Nye has stated more generally:

> The corporation's creation and control of such materials is a metaphor for its cultural hegemony. … Corporations edit archives, control access to papers, underwrite favorable works, destroy evidence (more often through neglect than by design), and lay down a barrage of favorable publicity that tells customers and stockholders how they ought to be understood.[18]

The first decades of the twentieth century clearly saw the emergence of industrial photographic communication all over the western world, and the collection discovered at the Institut Emile Metz is a self-contained and relevant example of this new practice. Similar archives can be found in other countries and for other industries. Krupp in Germany, for instance, has a company archive of about two million photographs.[19] In the United States, the Ford Motor Company, General Electric, and the National Cash Register have equally impressive photographic holdings.[20] If we agree that these photographs can also be understood as ideological tools, this implies that they were subtly articulated constructs, made for a specific purpose. In the case of the glass plates from the Institut Emile Metz, the question then is how to understand them as ideological instruments. And how does this relate to the portraits of workers and leading industrialists and the photographic representations of the influential women of Luxembourg's dynasties of steel? To investigate this issue, I want to focus on how the subjectivities of workers as well as of male and female leaders were constructed through these photographs.

4 The Genealogy of Steel in Luxembourg: Photographic Representations of Male and Female Leaders

In her seminal analysis of "Photography and Society," Gisèle Freund traced the history of the medium in France, showing how it was gradually adopted

18 David E. Nye, *Image Worlds: Corporate Identities at General Electric, 1890–1930* (Cambridge, MA: MIT Press, 1985), 3.

19 See, for instance, Klaus Tenfelde, ed., *Bilder von Krupp: Fotografie und Geschichte im Industriezeitalter* (Munich: C. H. Beck, 1994); *Krupp: Fotografien aus zwei Jahrhunderten* (Berlin: Deutscher Kunstverlag, 2011); Heinrich Theodor Grütter, ed., *200 Jahre Krupp: Ein Mythos wird besichtigt. Katalog zur Ausstellung im Ruhr Museum vom 31. März bis 4. November 2012* (Essen: Klartext, 2012).

20 Nye, *Image Worlds*; Elspeth H. Brown, *The Corporate Eye: Photography and the Rationalization of American Commercial Culture, 1884–1929* (Baltimore, MD: Johns Hopkins University Press, 2008).

throughout all societal classes. Importantly, she emphasized that it was the socially dominant classes—industrialists, bankers, statesmen, men of letters or science, and intellectuals—who first took to photography in the nineteenth century.[21] In other words, Freund stresses the early and crucial link between photography and power. While intellectual and scientific curiosity and openness to a novel technology certainly led to an interest in photography, I would argue that the social elites not only responded to the excitement of the invention, but also to photography's potential to visually represent and promote ideas. Here, the photographs' portability as well as their reproducibility were particularly important.

Indeed, photographs are what Bruno Latour called "immutable mobiles"—objects that are "mobile but also *immutable*, *presentable*, *readable* and *combinable*." [22] As such, they were able to infiltrate every stratum of society. This mobility was further enhanced through refinements in the half-tone process in the late nineteenth century, which allowed photographic images to be included in printed texts, books, newspapers, and magazines. On this new material support they could then travel, be seen, and discussed by a larger public. In Luxembourg, images of ARBED could thus enter public spaces and private homes while spreading and consolidating, both at home and abroad, the image of a steel empire in the making.[23]

To be recognizable, the corporation needed to be visible. Of crucial importance, therefore, was the representation of its key personalities, its founding fathers and directors, such as Emile Metz or Emile Mayrisch, who had shaped not only the company but, through their economic decisions and political influence, the entire country. Their authority and prominence had to be publicly stated and acknowledged, and photographs proved to be valuable tools in this endeavor—as I will show by using examples from the glass plate collection at the Institut Emile Metz and looking at their use in the print media. The wives and daughters of the leading industrialists played an important part, too. I will use two images of Edmée Metz-Tesch to show how women have been represented visually and how their subjectivities have been constructed within the universe of the steel corporation.

In 1937, Joseph Wagner, an engineer and department manager at ARBED Dommeldange, and Camille Aschman, a chemist at the same plant as well as a chemistry teacher at the Institut Emile Metz, published an article titled "Fondateurs d'usines, maîtres de forges et grands maîtres de l'industrie sidérurgique

21 Gisèle Freund, *Photographie et société* (Paris: Editions de Seuil, 1974), 21–33.

22 Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Milton Keynes: Open University Press, 1987), 26, emphasis in original.

23 For a discussion of how photographs were instrumentalized for the ideology of ARBED, see also Poos, "The Making of a National Audio-Visual Archive," 81–88.

luxembourgeoise" (Mill Founders, Masters of Forges, and Grand Masters of the Luxembourg Steel Industry) in the *Revue Technique Luxembourgeoise*, a specialized journal aimed at engineers and industrialists.[24] The paper presented what the authors called a "chart" of the most important figures in the history of Luxembourg's steel industry, starting in 1564 with William the Silent, Count of Nassau and Vianden, who had built the first iron ore melting furnace in the north of Luxembourg, and ending with Norbert Metz, who began his career as the head of the plants in Dudelange (1920) and Esch (1923) before becoming director at ARBED headquarters in Luxembourg in 1926. It was an anniversary issue of the *Revue Technique*, which explains the long and detailed historical overview. The declared aim of the authors was "to assemble a compilation of data and facts, established with a concern for authenticity for the use of those who want to research [the country's] industrial past, which still presents too many lacunae."[25] The text itself was constructed as a succession of biographical entries of variable length. Taken together, the biographical notices are a genealogy of steel making in Luxembourg, showing the linkages and connections between families and interests.

Portraits, engravings, photogravures, or photographs complement the entries and reinforce the notion of a dynasty of steel barons, united in what resembles an ancestral portrait gallery. The visual editing underlines this sense of unity. All the portraits are headshots, framed at bust level, showing their subjects in a pose reflecting self-confidence and importance (see fig. 2.1). In accordance with portrait tradition, they do not smile, as "the only expression allowable in great portraiture is the expression of character and moral quality, not anything temporary, fleeting, or accidental."[26] This has been the pose of the rich and the powerful as they have been immortalized through paintings for centuries, and the photographically depicted Victor Tesch, Auguste, Edouard and Emile Metz, Emile Mayrisch, and the likes are clearly recognizable as belonging to this class.

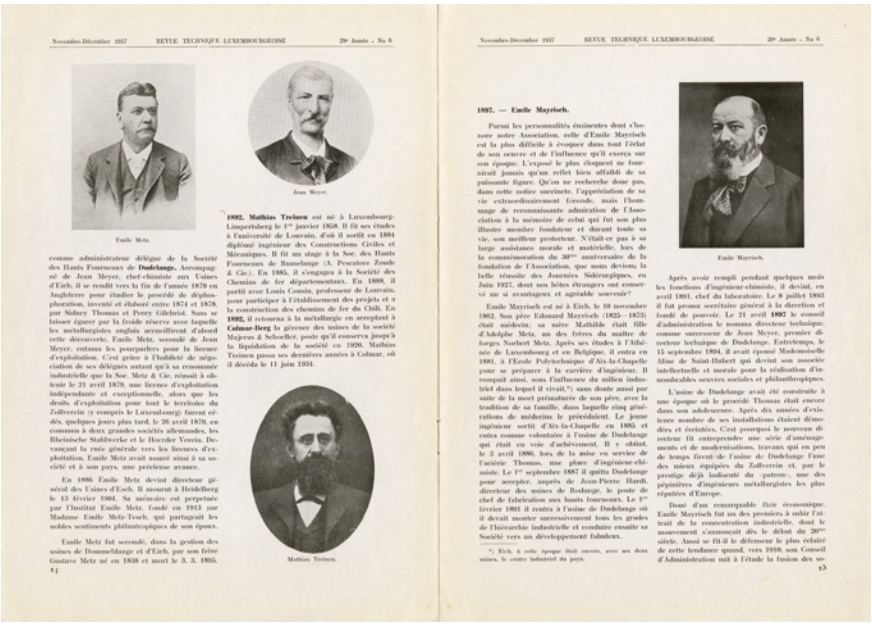
Revue Technique was not the only print outlet to consolidate the image of Luxembourg's steelmakers. The popular weekly magazine *A–Z Luxemburger illustrierte Wochenschrift*, published from 1933 to 1939, played a significant role in spreading similar ideas to a much broader public.[27] Indeed, Camille Aschman,

24 Wagner and Aschman, "Fondateurs d'usines, maîtres de forges et grands maîtres de l'industrie sidérurgique luxembourgeoise," 133–52.

25 Ibid., 133.

26 Edward Burne-Jones, cited in Gordon C. Aymar, *The Art of Portrait Painting* (Philadelphia, PA: Chilton Book Co., 1967), 119.

27 *A–Z* was first published on December 24, 1933, and ceased its activities with the German invasion of Luxembourg in 1939. As an illustrated magazine, it wanted to be informative



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Emile Metz.

Jean Meyer.

comme administrateur délégué de la Société des Hauts Fourneaux de **Dudelange**. Accompagné de Jean Meyer, chef-chimiste aux Usines d'Esch, il se rendit vers la fin de l'année 1879 en Angleterre pour étudier le procédé de déphosphoration, inventé et élaboré entre 1874 et 1878, par Sidney Thomas et Percy Gilchrist. Sans se laisser égarer par la froide réserve avec laquelle les métallurgistes anglais accueillirent d'abord cette découverte, Emile Metz, secondé de Jean Meyer, entama les pourparlers pour la licence d'exploitation. C'est grâce à l'habileté de négociation de ses délégués autant qu'à sa renommée industrielle que la Soc. Metz & Cie. réussit à obtenir le 21 avril 1879, une licence d'exploitation indépendante et exceptionnelle, alors que les droits d'exploitation pour tout le territoire du Zollverein (y compris le Luxembourg) furent cédés, quelques jours plus tard, le 26 avril 1879, en commun à deux grandes sociétés allemandes, les Rheinische Stahlwerke et le Hoerder Verein. Devançant la ruée générale vers les licences d'exploitation, Emile Metz avait assuré ainsi à sa société et à son pays, une précieuse avance.

En 1886 Emile Metz devint directeur général des Usines d'Esch. Il mourut à Heidelberg le 13 février 1904. Sa mémoire est perpétuée par l'Institut Emile Metz, fondé en 1913 par Madame Emile Metz-Tesch, qui partageait les nobles sentiments philanthropiques de son époux.

Emile Metz fut secondé, dans la gestion des usines de Dommeldange et d'Esch, par son frère Gustave Metz né en 1838 et mort le 3. 3. 1895.

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1892. Mathias Treinen est né à Luxembourg-Limpertsberg le 1er janvier 1858. Il fit ses études à l'université de Louvain, d'où il sortit en 1884 diplômé ingénieur des Constructions Civiles et Mécaniques. Il fit un stage à la Soc. des Hauts Fourneaux de Rumelange (A. Pescatore Zonde & Cie.). En 1885, il s'engagea à la Société des Chemins de fer départementaux. En 1888, il partit avec Louis Cousin, professeur de Louvain, pour participer à l'établissement des projets et à la construction des chemins de fer du Chili. En **1892**, il retourna à la métallurgie en acceptant à **Colmar-Berg** la gérance des usines de la société Majoros & Schoeller, poste qu'il conserva jusqu'à la liquidation de la société en 1920. Mathias Treinen passa ses dernières années à Colmar, où il décéda le 11 juin 1934.

Mathias Treinen.

Novembre-Décembre 1937 REVUE TECHNIQUE LUXEMBOURGEOISE 29e Année - No 6

1897. — Emile Mayrisch.

Parmi les personnalités éminentes dont s'honore notre Association, celle d'Emile Mayrisch est la plus difficile à évoquer dans tout l'éclat de son œuvre et de l'influence qu'il exerça sur son époque. L'exposé le plus éloquent ne fournirait jamais qu'un reflet bien affaibli de sa puissante figure. Qu'on ne recherche donc pas, dans cette notice sincèrement, l'appréciation de sa vie extraordinairement féconde, mais l'hommage de reconnaissante admiration de l'Association à la mémoire de celui qui fut son plus illustre membre fondateur et durant toute sa vie, son meilleur protecteur. N'était-ce pas à sa large assistance morale et matérielle, lors de la commémoration du 30ème anniversaire de la fondation de l'Association, que nous devions la belle réussite des Journées Sidérurgiques, en Juin 1927, dont nos hôtes étrangers ont conservé un si avantageux et agréable souvenir?

Emile Mayrisch est né à Esch, le 10 novembre 1862. Son père Edouard Mayrisch (1825—1873) était médecin; sa mère Mathilde était fille d'Adolphe Metz, un des frères du maître de forges Norbert Metz. Après ses études à l'Athénée de Luxembourg et en Belgique, il entra en 1881, à l'Ecole Polytechnique d'Aix-la-Chapelle pour se préparer à la carrière d'ingénieur. Il rompait ainsi, sous l'influence du milieu industriel dans lequel il vivait,*) sans doute aussi par suite de la mort prématurée de son père, avec la tradition de sa famille, dans laquelle cinq générations de maîtres de forges se succédaient. Le jeune ingénieur sortit d'Aix-la-Chapelle en 1885 et entra comme volontaire à l'usine de Dudelange qui était en voie d'achèvement. Il y obtint, le 3 avril 1886, lors de la mise en service de l'aciérie Thomas, une place d'ingénieur-chimiste. Le 1er septembre 1887 il quitta Dudelange pour accepter, auprès de Jean-Pierre Hardt, directeur des usines de Rodange, le poste de chef de fabrication aux hauts fourneaux. Le 1er février 1891 il rentra à l'usine de Dudelange où il devait monter successivement tous les grades de l'hiérarchie industrielle et conduire ensuite sa Société vers un développement fabuleux.

*) Esch, à cette époque était encore, avec ses deux usines, le centre industriel du pays.

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Emile Mayrisch.

Après avoir rempli pendant quelques mois les fonctions d'ingénieur-chimiste, il devint, en avril 1891, chef du laboratoire. Le 8 juillet 1893 il fut promu secrétaire général à la direction et fondé de pouvoir. Le 21 avril **1897** le conseil d'administration le nomma directeur technique, comme successeur de Jean Meyer, premier directeur technique de Dudelange. Entretemps, le 15 septembre 1894, il avait épousé Mademoiselle Aline de Saint-Hubert qui devint son associée intellectuelle et morale pour la réalisation d'innombrables œuvres sociales et philanthropiques.

L'usine de Dudelange avait été construite à une époque où le procédé Thomas était encore dans son adolescence. Après dix années d'existence nombre de ses installations étaient démodées et exténuées. C'est pourquoi le nouveau directeur fit entreprendre une série d'aménagements et de modernisations, travaux qui en peu de temps firent de l'usine de Dudelange l'une des mieux équipées du Zollverein et, par le prestige déjà indiscuté du «patron», une des pépinières d'ingénieurs métallurgistes les plus réputées d'Europe.

Doué d'un remarquable flair économique, Emile Mayrisch fut un des premiers à subir l'attrait de la concentration industrielle, dont le mouvement s'annonçait dès le début du 20ème siècle. Aussi se fit-il le défenseur le plus éclairé de cette tendance quand, vers 1910, son Conseil d'Administration mit à l'étude la fusion des so-

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FIGURE 2.1 Spread from a publication on Luxembourg's captains of steel and mining industries. Reprinted from Wagner and Aschmann, "Fondateurs d'usines, maîtres de forges et grands maîtres de l'industrie sidérurgique luxembourgeoise" (1937), 146–47.

co-author of the historical overview in *Revue Technique*, had previously published a series of twenty-two articles entitled "Daten aus der luxemburgischen Eisenindustrie" (Data from the Luxembourg steel and iron industry) in *A–Z* between 1935 and 1936.[28] There, Aschman provided not only detailed historical and geographical facts about iron and steel production in Luxembourg, but he also used over 300 images to illustrate his articles. Aschman, himself from a bourgeois family of doctors, entrepreneurs, and industrialists, was particularly

but also entertaining. Taken over in the summer of 1934 by the socialist politician and publisher Hubert Clement, *A–Z* set out to be an alternative to the dominant Catholic print media targeting families. See also Romain Hilgert, *Les journaux au Luxembourg, 1704–2004* (Luxembourg: Service information et presse du gouvernment luxembourgeois, 2004), 188.

28 Published between August 4, 1935, and May 19, 1936, the articles appeared biweekly on a three-page spread. They covered a wide range of subjects, from the earliest exploitation of iron ore in Luxembourg to the history of individual foundries and steel plants, and included even a two-part anthology of writers on the steel industry, where we also find a short biographical notice about Aschman himself.

interested in the leading cast of the iron industry. While workers are absent from his writings, his texts abound in information about the steel company's leading figures and personalities. Not surprisingly, we find the same portraits in both the illustrated *A–Z* and the *Revue Technique*.

Importantly, many of the portraits used for either the article in *Revue Technique* or the series in *A–Z* are part of the glass plates collection found at the Institut Emile Metz, where Camille Aschman worked as a chemistry teacher. A conversation that I had with Aschman's great-grandson, Philippe Aschman, in the spring of 2016 further revealed that Camille Aschman also had made glass plates himself, before and during his service at ARBED Dommeldange. The family's private archive proved to be a true treasure trove: It included not only more glass plate portraits from the *A–Z* articles but also a folder containing the extensive correspondence that Aschman had carried on with the leaders of the steel industry or their families in order to gather the portraits for his writings. He then re-photographed the images and produced negatives from positives to be included in his texts (see fig. 2.2). Through his activities as author and photographer, and because of his contacts to the illustrated press, Camille Aschman thus became instrumental in distributing and disseminating ideas about, and visions of, the Luxembourg steel and iron industry in the 1930s.

In his influential analysis of the origin and spread of nationalism, Benedict Anderson stressed the importance of print media "to create popular vernacular-based" ideas of nationhood in Europe.[29] Reading a newspaper, he wrote, "created an imagined community among a specific assemblage of fellow-readers."[30] Photographs add a strong visual support in creating a sense of belonging between members of the same cultural group. In Luxembourg, *A–Z* set out to do exactly that: to unite a national readership around visual

FIGURE 2.2
Nicolas Tockert, director of ARBED Dommeldange, 1897–1900. Digital positive from glass plate negative.
© INSTITUT EMILE METZ. CNA COLLECTION.

29 Benedict Anderson, *Imagined Communities* (London: Verso, 1983), 139.
30 Ibid., 62.

information about the country. Looking back on the challenges of the first two years of publication, the magazine's editor, M. W., in January 1936 stated:

> Our country is an extended family, complete with friendships and circles of acquaintances. Even if one lives up north in Uelflingen and the other in Esch, they are almost neighbors. Connections run from almost everyone, across all paths and hamlets of our country; sometimes one forgets, but suddenly there is an image in *A–Z*, and one remembers. The family rummages through its past, and it is obvious that the photos show characteristics of one's own family.
>
> What I want to say is that our illustrated magazine is a precious thing for maintaining among our people the feeling of immediate belonging. It is a good thing to preserve this feeling beyond political conflicts and ideology.
>
> Not to mention the fact that *A–Z* faithfully disseminates, through images, the festive celebrations, customs and traditions, sports and games throughout the entire country, thus representing an important means of information in this field as well.[31]

As a teacher, Aschman wanted to educate a broader public about the history of the Luxembourg steel industry. Therefore, he provided detailed data and richly illustrated his texts with numerous images. Aschman's solid research gave his texts the necessary weight, while their positive tone conveyed a sense of pride that the author shared with his readers, thus creating a sense of national belonging around the subject of the steel industry. In this imagined community of Luxembourg, the captains of the steel industry, represented authoritatively through photographs, stand out as leading figures. The nation-wide circulation of their portraits clearly contributed to their public prominence. Moreover, the portraits' repeated use helped forge a collective understanding of what it meant to be an industrialist in Luxembourg in the early twentieth century. Eventually, the industrialists' public images and official functions became more important than their private personalities. Individuals such as Emile Metz or Emile Mayrisch were transformed into types through their photographic representation. As national icons they became an integral part of the cultural and industrial memory of the country.

Not surprisingly, representations of men dominate in the glass plate collection from the Institut Emile Metz, and there are almost no women's portraits

31 M. W., "A–Z tritt in ihr 3. Lebensjahr," *A–Z Luxemburger illustrierte Wochenschrift*, January 5, 1936, 3.

FIGURE 2.3
Edmée Metz-Tesch, ca. 1915. Digital positive from glass plate negative.

to be found until the 1930s—with the exception of Edmée Metz-Tesch who was, after all, the founder of the institute. Indeed, the glass plate collection includes two portraits of Metz-Tesch. The first, in the numerical order of entry at the CNA archive, shows her around 1915 in an informal setting, sitting on an outside terrace or porch (see fig. 2.3). She was around seventy years old at the time, and though her face is marked by age, her light, piercing eyes are resolutely facing the camera. Her hat and clothes match the descriptions of elegance and expensive taste cited earlier. The self-confidence emanating from the portrait seems to confirm that this is a woman who would read the *Memoirs of Casanova* or the writings of Anatole France and establish a vocational training school with a progressive reformist outlook. Interestingly, not much has been written about Edmée Metz-Tesch.[32] She is, however, the only woman mentioned by Camille Aschman in an *A–Z* article about the foundry and steel plant of Dommeldange. Aschman also included a photograph of her, but it is an earlier engraving of Edmée Metz-Tesch, showing her as the young woman that Jules Mersch described in his *National Biography* (fig. 2.4).

A photographic reproduction of the original engraving by Camille Aschman also figures in the collection from the Institut Emile Metz. Was Aschman's choice motivated by an attempt to render a flattering image of the institute's benefactress or was it rather in keeping with the dominant male view of gendered roles in the steel dynasties? It is difficult to know. While the portrait of the resolute, independent widow leaves a lasting impression, it is her younger, flawless self that would be remembered in the popular imagination.

32 Edmée Metz-Tesch has been largely overshadowed by another important female figure, Aline Mayrisch de Saint-Hubert, and her political and cultural initiatives, such as the Colpach Circle. For a detailed discussion of the role of Aline Mayrisch, see Germaine Goetzinger, "Aline Mayrisch: féministe engagée, philanthrope éclairée, femme de lettres éminente," *Mémoires de l'Académie nationale de Metz* 194 (2013): 95–107. See also Klaus Dittrich, "Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period," in this volume.

Bild 89. — Emil Bian.
Direktor des Dommeldinger Hüttenwerkes von 1900-1918.

Bild 90. — Dr. J. P. Arend
Direktor des Dommeldinger Hüttenwerkes von 1918-1921. Jetzt Direktor in der Centralverwaltung und Direktor des Instituts Emil Metz.

Bild 91. — Leopold Biver.
Direktor des Dommeldinger Hüttenwerkes seit 1921.

Die Erzeugnisse des Dommeldinger Werkes sind:
Elektro-Werkzeugstähle: Kohlenstoffstähle und legierte Stähle (Cobalt—Wolfram—Chrom—Manganstähle).
Elektro-Baustähle für Motoren und allgemeinen Maschinenbau: Kohlenstoffstähle und legierte Stähle (Nickel-Chromstähle).
Rostfreie Stähle (Hochprozentige Chromstähle).
Verschleißfeste Stähle (Hochprozentige Manganstähle).
Stahlgußstücke und Schmiedestücke.

***

Als Direktoren fungierten in Dommeldingen:

Gustav Metz gest. 1895 (Bild in Nr. 37)	
Leduc	1895—1897
Tockert	1897—1900
Emil Bian	1900—1918
Dr. J. P. Arend	1918—1921
Leopold Biver	seit 1921

Institut Emil Metz.

Im Bering des Dommeldinger Werkes liegt das Institut Emil Metz, welches eine von Frau Emil Metz-Tesch ins Leben gerufene philantropische Gründung für die Arbeitersehaft Dommeldingens und Umgebung ist. Die Grundsteinlegung des Institutes erfolgte am 20. Oktober 1913, Ende Juli 1915 war der Bau im großen Ganzen beendigt. Das Institut widmet sich der Aufgabe die gewerbliche Ausbildung der Lehrlinge zu übernehmen. Außer der notwendigen Allgemeinbildung werden den Schülern theoretische Kenntnisse vermittelt. Gleichzeitig werden sie in besonderen Werkstätten — die hinter dem Institut in einem Neubau gelegen sind — für ihren späteren Beruf ausgebildet.

Bild 92.
Mme. E. Metz-Tesch
1845-1919.

Bild 93. — Das Institut Emil Metz in Dommeldingen.

— 15 —

FIGURE 2.4 Page from Aschman, "Daten aus der luxemburgischen Eisenindustrie" (1935), 15.

5 Building Loyalty, Creating Categories: Portraits of Workers

In the developing era of industrialization, photographs were used extensively in the field of corporate communications, in Luxembourg as elsewhere. The circulation of images about a company and its leaders was an important means to convey stability and trustworthiness to politicians, stockholders, and clients,

as well as to employees and workers. Interestingly, the glass plate collection from the Institut Emile Metz also contains many portraits of workers associated with factory products of different shapes and sizes, from giant cogwheels to turbines for cruise ships. Work portraits are a significant component of industrial archives, as they have an important double function. Indeed, as American cultural theorist Elspeth Brown pointed out in her analysis of the role of photography in the rationalization of American commercial culture between 1884 and 1929, "photography's indexical qualities made it a potent ideological tool, providing a human face to the otherwise soul-less corporation … [and] building worker loyalty."[33] The work portrait not only represented the human dimension of the industrial environment, it also individualized the worker, conferring upon him visibility and recognition. Therefore, "managers actively worked to create a visual culture of dignified labor as a means of increasing job satisfaction and discouraging unionization."[34]

Compared to other international corporations, ARBED had a manageable size, with a maximum of 25,000 workers and employees spread over several plants and firmly rooted in their local communities. The company was less anonymous than many other corporations abroad. The German company Krupp, for instance, had had 75,000 employees as early as 1887, and employment rolls at General Electric in the United States had grown from 6,000 in 1885 to 82,000 in 1920. There, not surprisingly, "the old paternal relations between management and labor, based on personal ties, could no longer bind the corporation together."[35] Luxembourg's ARBED, however, was a different case. Internal communication within the smaller corporation may not have seemed a priority, as may be confirmed by the lack of employee magazines. And the inclusion of workers in images of the company's products may have been partly motivated by practical considerations, such as providing an idea of the scale of the displayed object.[36]

I would argue, however, that the work portraits in the glass plate collection also resonate with concerns for "a visual culture of dignified labor." The image shown in figure 2.5 is a good example. Two gigantic cast iron rings for a blast furnace top are leaning, one slightly overlapping the other, against the brick wall of a production hall. They have been arranged in space for maximum effect, and the image is carefully composed. Vertical and horizontal

33 Brown, *The Corporate Eye*, 146.

34 Ibid.

35 Nye, *Image Worlds*, 75.

36 See Ira Plein's discussion of notions of scale in portraits of workers: Ira Plein, "Machines, Masses, and Metaphors: The Visual Making of Industrial Work(ers) in Interwar Luxembourg" (in this volume).

FIGURE 2.5
"Hauts Fourneaux. 1+1 anneau pour gueulard. Tintinger" (Blast furnace. 1+1 ring for blast furnace top. Tintinger). Undated. Digital positive from glass plate negative.

lines divide the frame, allowing the eye to wander from the elongated frosted window panes at the top, down the finely structured wall, across the dirt floor in the foreground. The circular shapes of the cast iron rings bring a dynamic element to the composition, which is balanced by the inclusion of an upright human figure. A worker wearing work clothes and a beret, hands on his hips, his moustache neatly trimmed, is facing the camera, framed by one of the rings that he most likely helped to produce.

The paper archive related to the glass plate collection allows us to identify the foundry worker by his last name, Tintinger. However, there is no indication about the man behind the camera. The photograph could have been taken by Camille Aschman. After all, he was an employee of ARBED Dommeldange, he was teaching chemistry at the Institut Emile Metz, and he was a photographer who had the necessary skills. While it is impossible, at this later stage, to determine who took this picture, the image reveals nevertheless a complicity between the photographer and the worker; they both take minute care to provide an appropriate setting for the actual subject of the photograph: the industrial product on display. There is, of course, more to the image. The upright position of the worker, his direct gaze, the clear-cut, well-kept face, his entire attitude show his love of, and pride in, a job well done. This is also what links both men, the photographer and the photographed, as their projections and desires meet inside the picture frame: the mutual recognition of their craftsmanship put at the service of ARBED.

Images such as this were used in promotional albums compiled and published by ARBED's sales and public relations office Columeta.[37] The albums

37 Columeta (Comptoir luxembourgeois de métallurgie) was created on June 19, 1920, as the sales office for ARBED and its sister steel company, Terres Rouges. While photographs were central in forging the image of Luxembourg's steelmakers abroad, film was also used

showcased extraordinary products and technological achievements, and were intended for customers around the world. Widely circulated, they also contributed to the valorization of the workers involved in the production process. At the same time, these images reinforce our understanding of the subjective body of the worker, his physical appearance and outfits, and the social category or class he belongs to. Compared with the portraits of the steel barons, the workers are clearly distinguished from the industrialists through the environment in which they are portrayed (in this case the production hall), their attire (their work clothes) and often also through their posture—elements that were fixed and circulated through the photographs.

In his discussion of "The Body and the Archive," American photographer and theorist Allan Sekula has stressed that photography, besides serving as an honorific means of representation, has also a repressive function.[38] Photographs valorize their subjects and at the same time sort them into different categories, confining them to specific spaces and thus repressing the subject. This double system is most visible in portraiture. Indeed, as Sekula notes, "the photographic portrait extends, accelerates, popularizes and degrades a traditional function. This function … is that of providing for the ceremonial presentation of the bourgeois *self*."[39] Cheaper, faster, and more readily available than traditional portraiture, photography can be considered a democratic medium, making visual representation possible for all classes of society.[40] This, in turn, is linked to notions of empowerment for under-represented social groups and classes, or the raising of historical consciousness through photographic representation. These ideas have been discussed in theory and practice, from Jacob Riis's explorations in 1890 of "how the other half lives" in the slums of New York to Christopher Pinney and Nicolas Peterson's "photography's other histories," that is, views of non-western, non-canonical representations.[41]

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very effectively as a tool for corporate communication. For a further discussion of this subject, see Charles Barthel, "'COLUMETA' ('Vu Feier an Eisen'): L'aventure du premier film publicitaire de l'ARBED," *Hémecht* 2 (1998): 177–206.

38 Allan Sekula, "The Body and the Archive," in *The Contest of Meaning: Critical Histories of Photography*, ed. Richard Bolton (Cambridge, MA: MIT Press, 1992), 343–88.

39 Ibid., 344, emphasis in the original.

40 For a further discussion of photography's honorific representational functions, see Pierre Bourdieu, *Un art moyen: essai sur les usages sociaux de la photographie* (Paris: Ed. de Minuit, 1965); Freund, *Photographie et société.*

41 See Jacob A. Riis, *How the Other Half Lives: Studies among the Tenements of New York* (New York: Charles Scribner's Sons, 1890; New York: Bartleby.com, 2000); Christopher Pinney and Nicolas Peterson, *Photography's Other Histories* (Durham, NC: Duke University Press, 2003).

At the same time, photography has been valued from a very early stage in the history of the medium as a tool for reproducing or translating the three-dimensional indexical referent almost perfectly onto a two-dimensional plane. It is commonly believed that photographs accurately depict reality.[42] In his text, Sekula more specifically refers to medical and anatomical illustrations, where photography "came to establish and delimit the terrain of the *other*, to define both the *generalized look*—the typology—and the *contingent instance* of deviance or social pathology."[43] Expanding on Sekula's idea, one could say that photographs have been used scientifically to visualize the norm and its deviances, and thus to create visual categories. By analogy, I want to argue that the portraits from the glass plate collection at the Institut Emile Metz also establish classifications of subjects and subjectivities. Therefore, they too have this double function of valorizing and repressing, which becomes most apparent in the portraits of the workers. As valorizing objects of representation, the photographs allow the workers to be visible and to appear in the corporate picture album. The camera enters and makes visible their work space, together with the product of their labor. At the same time, these photographs define the "worker" as a specific type, confining him to a specific social space. Indeed, defining a type implies the creation of categories and boundaries: objects and people are assigned to clearly defined classes or groups. These classifications are part of an ordering mechanism that functions as a regulatory system: every "body" belongs to a space determined by the hierarchy of the corporation.

In the context of the steel industry, photography thus can be understood as part of the "disciplinary power" in the Foucauldian sense—that is, as part of a "whole set of instruments, techniques, procedures, levels of applications, targets" which act upon the subjective body.[44] As the glass plates reveal, photography had a regulatory function both inside and outside the company ARBED. Internally, it helped maintain a certain order by building loyalty and corporate identity. To the outside world, corporate photographs, such as the images from

42 For a discussion of photography's indexicality and truth value, see, for instance, Roland Barthes' seminal *Camera Lucida: Reflections on Photography*, trans. Richard Howard (London: Jonathan Cape, 1982); J. J. Long, Andrea Noble, and Edward Welch, eds., *Photography: Theoretical Snapshots* (London: Routledge, 2009); Richard Bolton, ed., *The Contest of Meaning: Critical Histories of Photography* (Cambridge, MA: MIT Press, 1992); Sarah Parsons, *The Meaning of Photography* (Williamstown, MA: Sterling and Francine Clark Art Institute, 2008).

43 Sekula, "The Body and the Archive," 346, emphasis in the original.

44 Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972–1977*, trans. Colin Gordon (New York: Pantheon Books, 1980), 121.

the Institut Emile Metz, through their repeated uses and circulations, shaped a certain view and understanding of society and its various components, emphasizing the subjective body and perpetuating distinctions of class and hierarchical order.

"To understand the 'photography effect' in the nineteenth century," stated Jonathan Crary, "one must see it as a crucial component of a new cultural economy of value and exchange, not as part of a continuous history of visual representation."[45] Or, as Elizabeth Edwards put it, "socially required 'realism,' the ontological scream of the medium, is the very basis for its social meaning. It is what people want photographs to do. This position moves the situation out of photographic and into cultural, social and political questions."[46] The glass plate negatives found at the Institut Emile Metz sustain the argument to study the social meaning of photographs, to look more closely at their significance as bundled, material objects, deeply rooted in their historical time and geographical space. This is not to minimize the attraction of the image surface or its power to captivate and trigger interest. However, it is only when we question photographs beyond the visual, when we investigate their circulation or discuss them as material objects translating individual or collective projections, wishes, and desires, that they appear as testimonies of a strong, lived history.

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45 Crary, *Techniques of the Observer*, 13.

46 Elizabeth Edwards, "Photographs as Strong History?," in *Photo Archives and the Idea of Nation*, ed. Costanza Caraffa and Tiziana Serena (Berlin: De Gruyter, 2015), 324.

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CHAPTER 3

Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period

Klaus Dittrich

The Grand-Duchy of Luxembourg is a small state in the heart of Western Europe. Surrounded by Belgium, Germany, and France, the country lacks direct sea access. Boasting a multilingual population, Luxembourg perceives itself as located at the crossroads of French and German culture. Considering its many and empirically traceable cross-border entanglements, a supranational European narrative of Luxembourg's history is a convincing proposition.[1] However, it is possible to extend the horizon still further. Luxembourgers reached out to regions beyond Europe, at least from the late nineteenth century onward. Emigration took place not only to the Americas but also to many other places around the world.[2] Similar to other landlocked countries like Switzerland, the Grand-Duchy fully participated in the commercial and cultural expansion of Europe.[3] Some historians go as far as attributing an imperial dimension to Luxembourg's history, for example by hinting at the existence of a colonial movement in Luxembourg and the involvement of Luxembourgers in the Belgian Congo.[4]

This chapter approaches the global dimension of Luxembourg's history by focusing on the country's entanglements with East Asia. Regular contacts with China and Japan started in the late nineteenth century. Here, too, Luxembourgers profited from their participation in networks of Belgian

1 See Piet Peporté et al., *Inventing Luxembourg: Representations of the Past, Space and Language from the Nineteenth to the Twenty-First Century* (Leiden: Brill, 2010).

2 Régis Moes, "Biographies globales et vies transnationales: Les Luxembourgeois dans la mondialisation au XIXe et XXe siècle," in *Populations, connections, droits fondamentaux: mélanges pour Jean-Paul Lehners*, ed. Norbert Franz, Thomas Kolnberger, and Pit Péporté (Vienna: Mandelbaum, 2015), 176–202.

3 Patricia Purtschert and Harald Fischer-Tiné, eds., *Colonial Switzerland: Rethinking Colonialism from the Margins* (Basingstoke: Palgrave Macmillan, 2015).

4 Régis Moes, *Cette colonie qui nous appartient un peu: la communauté luxembourgeoise au Congo belge, 1883–1960* (Luxembourg: Fondation Robert Krieps, 2012).

informal imperialism.[5] From the mid-1890s to 1911, engineers and skilled workers from Luxembourg were employed by the Hanyang Iron & Steel Works in Wuhan, the first modern metallurgical factory in China. During the same period, Luxembourgers actively participated in railway construction in China, notably in the service of the Hankow-Peking and Hankow-Canton railway companies.[6] Furthermore, Catholic missionaries of the Franciscan and Jesuit orders from Luxembourg served in China and Japan.[7] The German-Luxembourgian Jesuit Joseph Dahlmann, for example, co-founded Sophia University in Tokyo in 1913.[8]

By far the most significant contributor to the Grand-Duchy's global connections was the steel industry. The country's dominant industrial conglomerate ARBED (Aciéries réunies de Burbach-Eich-Dudelange) was created in 1911 through a merger of three pre-existing companies.[9] The East Asian countries were a rather important market for Luxembourgian steel, especially after the First World War, when Luxembourg left the German Customs Union and had to open up new, global markets. In 1925, ARBED's sales organization Columeta established a branch in Tokyo and, three years later, opened another office in Osaka.[10]

The influence and interests of Luxembourg's industrial elite went far beyond steel production. This chapter focuses on Aline Mayrisch de Saint-Hubert, the wife of Emile Mayrisch, founder and chairman of ARBED until his sudden death in a car accident in 1928. Aline Mayrisch was well known as a key philanthropist and intellectual in interwar Luxembourg. She paid particular attention to public health and served in leadership positions with the Luxembourg Red Cross (Croix-Rouge luxembourgeoise) and the Luxembourg

5 Daniel Laqua, *The Age of Internationalism and Belgium, 1880–1930: Peace, Progress and Prestige* (Manchester: Manchester University Press, 2015).

6 Robert L. Philippart, *L'activité industrielle d'Eugène Ruppert en Chine* (Luxembourg: n.p., 1987).

7 Régis Moes, "Le clergé catholique luxembourgeois et le monde: Historiographie des missionnaires du Grand-Duché de Luxembourg en Asie et en Afrique (19e–20e siècles)," *Hémecht: Zeitschrift für Luxemburger Geschichte* 66 (2014): 474–75. See also Gregoria Dondelinger, *Im chinesischen Hexenkessel: Missionsfahrt der Luxemburger Franziskanerinnen 1929/1930* (Luxembourg: Mutterhaus der Franziskanerinnen, 1931).

8 Harald Fuess, "Deutsche Jesuiten in Japan," *Japanstudien: Jahrbuch des Deutschen Instituts für Japanstudien* 17 (2005): 86; Volker Zotz, "Joseph Dahlmann: ein Buddhismusforscher in Luxemburg," *Forum fir kritesch Informatioun iwer Politik, Kultur a Relioun* 212 (2001): 39–41.

9 René Leboutte, Jean Puissant, and Denis Scuto, *Un siècle d'histoire industrielle (1873–1973): Belgique, Luxembourg, Pays-Bas. Industrialisation et sociétés* (Paris: Sedes, 1998).

10 Klaus Dittrich, "Selling Luxembourgian Steel in Japan: Columeta Tokyo, 1925 to 1941," *Zeitschrift für Unternehmensgeschichte* 61 (2016): 215–36.

Anti-Tuberculosis League (Ligue luxembourgeoise contre la tuberculose).[11] Mayrisch also socialized with and contributed to a variety of intellectual circles and financially supported writers with whom she sympathized. While her Luxembourgian and European initiatives are well studied, her activities outside of Europe have rarely been systematically analyzed. Mayrisch not only undertook several trips to North Africa, the Middle East, and Persia; she also travelled two times to Japan, in 1930 and 1934, and on both occasions also shortly visited China.

This chapter thus traces Mayrisch's connections with East Asia and discusses the trips she undertook to this region.[12] It asks how Mayrisch, as a representative of the European capitalist upper class and a woman with intellectual inclinations, approached and experienced Japan. It combines an analysis of her intellectual networks and business relations with a discussion of her involvement with public health issues. At the same time, a look at Mayrisch's extensive networks of French and German acquaintances helps place the analysis in the broader framework of European-Japanese contacts and European discourses on Japan in the interwar period.[13] In particular, the chapter elucidates the tensions between Mayrisch's longing for an idealized and spiritual Orient and her experience of modern Japan, a country that, moreover, struggled with similar public health issues as did Luxembourg.

Drawing on a variety of sources, including archival materials held by Luxembourg's Centre national de littérature in Mersch as well as the published correspondence of Mayrisch, this chapter first provides an overview of Mayrisch's networks reaching out to East Asia and sketches the trips she undertook in this region. Second, it discusses how Mayrisch experienced Japan and the Japanese and, more specifically, looks at a corpus of photographs that Mayrisch brought back from that country. Finally, it analyzes Mayrisch's activities in Japan as a representative of the Luxembourg Red Cross.

11 See Enric Novella, "Germs, Bodies, and Selves: Tuberculosis, Social Government, and the Promotion of Health-Conscious Behavior in the Early Twentieth Century" (in this volume).

12 The most comprehensive elaboration on this topic to date can be found in Tony Bourg, "Madame Mayrisch et l'Orient," in *Joseph et Ria Hackin, couple d'origine luxembourgeoise au service des arts asiatiques et de la France: exposition du 11 novembre 1987 au 3 janvier 1988, Luxembourg* (Luxembourg: Musée d'histoire et d'art, 1987), 52–69.

13 Chun-shik Kim, *Ostasien zwischen Angst und Bewunderung: Das populäre deutsche Ostasienbild der 1930er und 40er Jahre in Reiseberichten aus dem japanischen Imperium* (Hamburg: Lit, 2001); Thomas Pekar, *Der Japan-Diskurs im westlichen Kulturkontext (1860–1920): Reiseberichte—Literatur—Kunst* (Munich: Iudicium, 2003).

1 Joining Orientalist Networks

The Mayrisch family played a prominent role in Europe, especially in the context of post-WWI Franco-German relations and reconciliation. Emile Mayrisch, for example, initiated the steel cartel Entente Internationale de l'Acier (EIA) in 1926 and founded the Comité franco-allemand d'information et de documentation, where Pierre Viénot, the husband of Mayrisch's only daughter Andrée, played a leading role. Beyond these formal institutions, the Mayrisch's home in Colpach was of major significance as a transnational meeting place.[14] In 1920, the Mayrisch family moved from their residence in the southern industrial town of Dudelange to the rural castle of Colpach in north western Luxembourg. They regularly invited writers and other intellectuals, mostly from France, Belgium and Germany, providing them with opportunities for exchange, recreation, and undisturbed work. Invitees also profited from the Mayrisch's extensive library. Generally referred to as the Colpach Circle, this network included, among others, the industrialist, writer, and politician Walter Rathenau, the philologist and Romance language scholar Ernst Robert Curtius, the philosopher Karl Jaspers from Germany as well as the French writers André Gide, Jacques Rivière, and Jean Schlumberger.[15]

Another important venue was the Décades de Pontigny. Starting in 1910, these annual ten-day meetings brought together intellectuals to discuss literary, religio-philosophical, and socio-political questions in the abbey of Pontigny in the Yonne department south-east of Paris.[16] When they resumed after the First World War, Aline Mayrisch regularly participated in these gatherings. Both Colpach and Pontigny brought together writers connected to the literary journal *Nouvelle Revue Française* (*NRF*). Founded by Gide, Schlumberger, Jacques Copeau, André Ruyters, and Henri Ghéon in 1908, the journal became the leading French magazine of cultural criticism during the interwar period. In other words, there was a huge overlap between the *NRF*, the Colpach Circle, and the Décades. Mayrisch, who was also a regular contributor to the *NRF*, was an integral part of all these intellectual networks.[17]

14 Hans Manfred Bock, "Colpach als transnationales Netzwerk," in *Toute la noblesse de sa nature: Recueil des écrits publiés par Aline Mayrisch de Saint-Hubert*, ed. Cornel Meder (Luxembourg: Edition du Cercle des amis de Colpach, 2014), 306–91.

15 *Hôtes de Colpach: Exposition au Centre national de littérature, Mersch 12 novembre 1997–20 février 1998*, ed. Germaine Goetzinger, Gast Mannes, and Frank Wilhelm (Mersch: Centre national de littérature, 1997).

16 François Chaubet, *Paul Desjardins et les décades de Pontigny* (Toulouse: Presses universitaires du Septentrion, 2000).

17 Karin Priem and Geert Thyssen, "Fragmented Utopia: Luxembourgian Industrialists, Intellectual Networks and Social-Educational Reforms between Tradition and Avant-Garde," *Jahrbuch für Historische Bildungsforschung* 19 (2013): 106–26.

The Colpach and Pontigny meetings were also the points of departure for Mayrisch's engagement with East Asia, as it was on these occasions that she got to know individuals with the relevant background knowledge and contacts. At the 1924 Pontigny meeting, which dealt with questions of comparative religion, Mayrisch met the orientalist Paul Masson-Oursel, professor at the Ecole pratique des hautes études in Paris.[18] A prominent specialist on India and author of *La philosophie comparée* (*Comparative Philosophy*), Masson-Oursel is considered the founder of the discipline of comparative philosophy.[19] This meeting might well have been the beginning of Mayrisch's interest in East Asian culture. Masson-Oursel introduced Mayrisch to Joseph Hackin, a Luxembourg-born, naturalized French citizen.[20] Their first meeting took place in the Parisian suburb of Boulogne-sur-Seine at the society Autour du monde (Around the World), of which Hackin had become an associated member in 1920. Founded in 1906 by the banker and philanthropist Albert Kahn, the society provided students with fellowships that allowed them to travel around the world, including East Asia.[21] Kahn, who admired Japan, had constructed a Japanese garden on the premises of the society in Boulogne. In 1923, Hackin became conservator at the Musée Guimet in Paris—then, as now, the most important museum of Asian art in France.[22] Hackin was also involved in archaeological excavations in Afghanistan. In 1927, Mayrisch invited him to give a lecture on Afghanistan at the *salle des fêtes* of the ARBED headquarters in downtown Luxembourg.[23] More invitations, including to Colpach, followed.

Hackin, in turn, introduced Mayrisch to the French historian and orientalist René Grousset, a professor at the Ecole des langues orientales vivantes and conservator at the Musée Guimet and other museums in Paris. Grousset was a specialist on Buddhism. He had authored a three-volume *Histoire de l'Asie* (History of Asia) in 1921, a *Histoire de la philosophie orientale* (History of oriental philosophy) in 1923 and *Sur les traces du Bouddha* (*In the Footsteps of the Buddha*) in 1929, which discusses the transfer of Buddhism from India to China in the seventh century. Grousset stayed several times in Colpach, where he also brought his daughters.[24] The French writer and diplomat Paul Claudel

18 Bourg, "Madame Mayrisch et l'Orient," 54.

19 Paul Masson-Oursel, *La philosophie comparée* (Paris: Alcan, 1923).

20 Jean-Claude Muller, "Joseph Hackin et le Luxembourg," in *Joseph et Ria Hackin*, 12–37.

21 Whitney Walton, *Internationalism, National Identities, and Study Abroad: France and the United States, 1890–1970* (Stanford, CA: Stanford University Press, 2010), 39–61.

22 Robert Stumper, *Luxemburger Wissenschaftler im Ausland* (Luxembourg: d'Letzeburger Land, 1962), 26–29.

23 Bourg, "Madame Mayrisch et l'Orient," 55.

24 William Marx, "Valéry et le bouddhisme: Essai de généalogie intellectuelle," in *Paul Valéry: Dialogues Orient & Occident*. Tokyo, Université Hitotsubashi, colloque international, 24–27 septembre 1996, ed. Kunio Tsunekawa (Paris: Lettres modernes Minard, 1998), 214.

also belonged to Mayrisch's network. After serving as consul in several Chinese cities between 1895 and 1909, Claudel was French ambassador in Tokyo from 1921 to 1927.[25] In November 1925, he gave a lecture in Luxembourg and was afterwards invited to Colpach. Claudel presented to Mayrisch copies of his play *Partage de Midi* (*Break of Noon*) and his prose poems *Connaissance de l'est* (*Knowing the East*) of 1906.[26] Richard Nikolaus Coudenhove-Kalergi, the famous founder of the Paneuropean Union who was born in Tokyo as the son of an Austrian diplomat and a Japanese mother, also came to Luxembourg in 1928.[27]

Several other writers who belonged to Mayrisch's circle of acquaintances had visited and written about East Asia. The Baltic German aristocrat Hermann von Keyserling had visited Japan in 1911 and 1912 during his trip around the world. His travel diary *Das Reisetagebuch eines Philosophen* (*The Travel Diary of a Philosopher*), published after the war, had been read by Mayrisch.[28] Keyserling argued that Asia could regenerate Europe.[29] Another member of the Colpach Circle with experience in Japan was the Belgian-born writer and painter Henri Michaux. He traveled to India, China, and Japan in 1931 and published an account of his trip two years later under the title *Un barbare en Asie* (*A Barbarian in Asia*).[30] The chapter on Japan takes a rather negative view of the archipelago, probably under the impression of the Japanese invasion of Manchuria. Michaux stressed the modern and bustling aspect of Tokyo, but characterized Japanese life as generally empty and dull.[31] The writer André Malraux had experienced Japan more intensely and took a more positive attitude.[32] East Asia figured prominently in his works *La tentation de l'occident* (*The Temptation of the West*) of 1926, *Les conquérants* (*The Conquerors*) of 1928, and *La voie royale* (*The Way of the Kings*) of 1930. Mayrisch also read the works of Paul Valéry whom she had met in Pontigny. Valéry had never been to

25 Jacques Houriez, *Paul Claudel ou les tribulations d'un poète ambassadeur: Chine, Japon, Paris* (Paris: H. Champion, 2012).

26 Bourg, "Madame Mayrisch et l'Orient," 62.

27 *Hôtes de Colpach*, 85–86.

28 Hermann Keyserling, *Das Reisetagebuch eines Philosophen* (Darmstadt: Reichl, 1919).

29 Joanne Miyang Cho, "Hermann Keyserling's View of Japan: A Nation of Consummate Imitators," in *Transnational Encounters and Comparisons between Germany and Japan: Perceptions of Partnership in the Nineteenth and Twentieth Centuries*, ed. Joanne Miyang Cho, Lee Roberts, and Chris Spang (London: Palgrave Macmillan, 2016), 53–70.

30 Henri Michaux, *Un barbare en Asie*, rev. and corr. ed. (Paris: Gallimard, 1986).

31 Mayrisch met Michaux for the first time in Colpach in June 1935, after her second trip to Asia. Michaux found Mayrisch full of passion for oriental spirituality. See Jean-Pierre Martin, *Henri Michaux* (Paris: Gallimard, 2003), 250.

32 Michel Temman, *Le Japon d'André Malraux* (Arles: Picquier, 1997).

Japan, but his 1919 contribution to the *NRF*, "La crise de l'esprit" (The crisis of the spirit), and his 1931 book *Regards sur le monde actuel* (*Reflections on the World Today*) drew upon comparisons and connections between "East" and "West."[33] According to Valéry, who sincerely believed in a genuine "European spirit," Europeans should not expect many new ideas from the "Orient." He saw East Asia primarily as a future economic competitor. Once the "East" would be equipped with industrial facilities, Europe would lose its dominant place in the world.[34]

These writers and their publications crucially shaped Mayrisch's perspective on Japan. They presented a highly philosophical approach and envisioned East Asia in relation to Europe's supposed superiority or decadence, depending on one's point of view, at a time when the latter continent was in a deep crisis after the First World War. It was only onboard the transatlantic steamer on the way to Japan that Mayrisch read more pragmatic literature, including *Les Peuples d'Extrême-Orient: Le Japon* (Peoples of the Far East: Japan), first published in 1921 by the international relations expert Emile Hovelaque who had been one of the first recipients of the Autour du monde grant between 1898 and 1900.[35]

2 Traveling Eastward

Like many Luxembourgers of the middle and upper classes, Mayrisch had been almost constantly on the move since receiving her secondary education in Belgium and Germany. However, it was not until shortly before the First World War that she left the continent for the first time, when, from April to June 1914, she traveled with the *NRF* writers Gide and Ghéon through Asia Minor.[36] In the spring of 1923, she made a trip to Morocco together with the writers Pierre Hamp and Paul Desjardins, the initiator of the Décades de Pontigny. In the spring of 1927, she travelled to Syria and Palestine with the writer, theologian,

33 Paul Valéry, "La crise de l'esprit," *Nouvelle Revue Française* 71 (1919): 321–37; Paul Valéry, *Regards sur le monde actuel* (Paris: Stock, 1931).

34 Michel Jaretty, *Paul Valéry* (Paris: Fayard, 2008), 610. See also Kunio Tsunekawa, ed., *Paul Valéry: Dialogues Orient & Occident.* Tokyo, Université Hitotsubashi, colloque international, 24–27 septembre 1996 (Paris: Lettres modernes Minard, 1998).

35 Emile Hovelaque, *Les Peuples d'Extrême-Orient: Le Japon* (Paris: Flammarion, 1921). On Hovelaque, see Walton, *Internationalism, National Identities, and Study Abroad*, 46. Mayrisch's records at the Centre national de littérature in Mersch include a copy of the *Livret-Guide du Japon* (Tokyo: Direction générale du tourisme/Ministère des chemins de fer de l'Etat japonais, 1931), an official tourist guide regularly published in several languages by the Japanese tourist office.

36 *Colpach* (Luxembourg: Amis de Colpach, 1978), 79.

and Middle East specialist Jean de Menasce.[37] In 1928, after the death of her husband, Aline Mayrisch left for Persia in the company of her daughter Andrée, Joseph Hackin, and René Grousset. The travelers made a short stop in Moscow and proceeded to Baku. Then, Mayrisch took a plane for the first time in her life for the last leg of her journey to Tehran. They visited key archeological remains of Persian culture and returned to Europe via Iraq and Palestine. A few months later, Mayrisch published a short article on Persia in which she outlined the country's recent achievements in public health.[38]

Mayrisch's first trip to East Asia started in September 1930. She traveled with her relative Hughes Le Gallais who was director of Columeta Tokyo and ARBED's chief representative in East Asia.[39] He was also a close friend of Hackin's and a collector of East Asian art. In 1925, Le Gallais had participated in the "Décade Europe-Asie" in Pontigny, giving a talk on Japanese tea ceremonies.[40] When Mayrisch accompanied him, he was on his way back to Japan after a six-month leave in Luxembourg. Initially, Mayrisch had planned to travel on the Trans-Siberian Railway. She had made arrangements for traversing Russia in an especially secured railway carriage that had been provided for the German ambassador in Tokyo.[41] For some reason, these plans could not be realized and Mayrisch traveled in a westward direction. The party left in September via Paris and Le Havre, crossed the Atlantic, saw New York and, after traversing the United States by train, crossed the Pacific. In Tokyo, she stayed with Le Gallais, in a "minuscule and uncomfortable" house owned by Columeta. Mayrisch also

37 Pascal Mercier, "L'amazone généreuse et le patricien fidèle," in *Aline Mayrisch—Jean Schlumberger: Correspondance 1907–1946,* ed. Pascal Mercier and Cornel Meder (Luxembourg: Ministère de la culture, de l'enseignement supérieur et de la recherche, 2000), 23.

38 Aline Mayrisch-Saint-Hubert, "Efforts d'hygiène en Perse," *Pour la santé* 10 (1929): 178–80.

39 The Belgian writer Alexis Curvers, a friend of the Mayrisch family and participant in the Colpach meetings, erroneously called Le Gallais "Ambassador of the Grand-Duchy of Luxembourg in Tokyo." See *Aline Mayrisch-de Saint-Hubert–Marie Delcourt-Curvers: Correspondance 1923–1946*, ed. Catherine Gravet and Cornel Meder (Luxembourg: Edition du Cercle des amis de Colpach, 2009), 62. Albeit false, this labelling testifies to the strong overlap of industrial and diplomatic functions in interwar Luxembourg. Indeed, Columeta's role by far exceeded the sale of steel products; see Gérald Arboit, "Un comptoir de vente particulier: Columeta," in *Les mutations de la sidérurgie mondiale du XXe siècle à nos jours/The Transformation of the World Steel Industry from the XXth Century to the Present*, ed. Charles Barthel, Ivan Kharaba, and Philippe Mioche (Brussels: Peter Lang, 2014), 199–221. Le Gallais later served as Luxembourg's ambassador in Washington, DC, from 1940 to 1958.

40 Pascal Mercier, "A l'est, rien de nouveau?," in Tsunekawa, *Paul Valéry: Dialogues Orient & Occident*, 238.

41 Pierre Masson and Cornel Meder, "Lettres d'Aline Mayrisch à Isabelle Rivière," *Galérie: Revue culturelle et pédagogique* 30 (2012): 102.

met Hackin who from 1930 to 1933 served as director of the Maison Franco-Japonaise, a French cultural institution founded during Claudel's ambassadorship in 1924. She and Le Gallais went to many antique shops and visited the major tourist sites of Nikkô, Kyoto, and Nara. Mayrisch also accompanied Le Gallais to Shanghai and Hong Kong where they met business partners. Mayrisch then traveled further south, to Indochina, Siam, and Malaysia, most of the time in the company of an English lady. In Singapore she met André Ruyters, one of the founders of the *NRF* and then in the service of the Banque Indochinoise.[42] She went back to Japan via Shanghai and Beijing, and came home via North America in May 1931.

In early 1934, Mayrisch made a trip to Egypt.[43] In the fall of the same year, she embarked on her second trip to Japan. This time she traveled via Canada. The main purpose of this trip was to attend the Fifteenth Congress of the League of Red Cross Societies.[44] In Tokyo, Mayrisch stayed again with Le Gallais. Her letters to Jean Schlumberger mention health problems that prolonged her stay in the country; she suffered from both physical and mental crises. Again Mayrisch visited major tourist spots and spent a week in the mountain resort of Miyanoshita. Before leaving the archipelago, she again visited Nara and spent a week in Kyoto.[45] On her return voyage, she had planned to explore India in the company of the German architect Otto Bartning. Since he was unable to join her, she went back home on her own and skipped India, welcoming the new year on the steamer between Kobe and Shanghai.[46] After spending a fortnight with Baroness Leonie von Ungern-Sternberg, the sister of Hermann von Keyserling, in Shanghai, she sailed directly to Venice and arrived in Luxembourg in March 1935.[47]

3 Experiencing Japan and the Japanese

Mayrisch's connections to East Asia were mainly mediated by French and—albeit to a much lesser degree—German scholars, intellectuals, and diplomats. How then did Mayrisch experience Japan? During the first decades of the twentieth century, Japan underwent a profound transformation. The First World War bestowed an unprecedented economic boom on Japan. The country

42 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 261.
43 Ibid., 369–71.
44 See below for a detailed discussion of Mayrisch's activities at the congress.
45 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 391.
46 Ibid., 395.
47 Mayrisch went on another trip to Morocco in April 1936.

was a considerable consumer of Luxembourgian steel. The Japanese steel mills were increasingly becoming serious competitors of European producers, including ARBED.[48] Internationally, the country belonged to the victorious camp after the war and was awarded great power status. Domestically, the 1920s were characterized by "Taishô democracy" before the rise of ultranationalism and militarism in the 1930s. Culturally, too, Japan had been "overcome by modernity," as historian Harry Harootunian famously put it.[49] The early 1930s especially, with the rise of cafés and a new entertainment culture, saw a modernity that has been characterized as "erotic grotesque nonsense."[50] While the Great Kantô Earthquake of 1923 destroyed Tokyo and its surroundings, the capital was rebuilt until 1930 in an ultramodern style. Moreover, Japan was the first non-Western empire to fully industrialize, but Mayrisch was mostly interested in old, "traditional," supposedly authentic Japanese things. She was in search of the "eternal Japan" as opposed to the Japan of the 1930s.

Mayrisch kept a diary during her first trip to Japan in 1930.[51] But it is her correspondence with Jean Schlumberger that best helps us to understand how she experienced Japan. In a letter Schlumberger sent to Mayrisch at the beginning of her trip, he wrote:

> One would like to know whether the Far East can furnish some unifying elements to civilization, or whether we—although finding inspiration in some of its ideas—have to fear the East as an element that may, perhaps, not destroy us but at least fight against us. We are starting to become aware that there are values there that are equivalent to ours. But this feeling of enrichment will only be a happy one if these values are not wholly inimical to ours. I look forward with great curiosity to your impressions.[52]

Mayrisch was interested to find out whether there was an alternative to the (crisis of) modernity she experienced in Europe. Her first impressions were

48 The rise of the Japanese steel industry and its perception as a competitor can be followed in the *Bulletin quotidien Columeta*, which can be accessed at the National Archives of Luxembourg (ANLux).

49 Harry Harootunian, *Overcome by Modernity: History, Culture, and Community in Interwar Japan* (Princeton, NJ: Princeton University Press, 2000).

50 Miriam Silverberg, *Erotic Grotesque Nonsense: The Mass Culture of Japanese Modern Times* (Berkeley: University of California Press, 2006).

51 For a summary of the diary, see Bourg, "Madame Mayrisch et l'Orient," 62–64. The diary, which comprises only 27 pages, is currently not accessible for copyright reasons.

52 Cited in Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 249. Unless otherwise indicated, all translations are the author's.

rather discouraging. Upon arrival to Japan she saw the modern harbor of Yokohama and the "'mechanized' suburbs" that she passed by car on her way to the nearby capital.[53] Tokyo appeared to her as a "capital where the old Japan no longer exists except for little islands here and there" and where everything reflected the social patterns she knew from home.[54] In a letter to Schlumberger, she offered several brief summaries of Japan and the Japanese. "For sure, the old Japanese culture is disappearing," Mayrisch underlined.[55] Japanese culture as it had existed until its opening to Western capitalism had lost its creative power. With the exception of Kyoto, Mayrisch described the big Japanese cities as "disastrously Americanized."[56]

Still, she observed a continuity of moral and aesthetic values that resisted the influx of Western rationalism and that continued to shape Japanese life.[57] She described the Japanese as a people gifted in character as well as human and artistic sensibility, but less so in terms of intelligence; a soft and brave people, devoted, persevering, polite, and smiling; a people that gave her a sense of an immense and unbroken past.[58] Charles Haguenauer, a professor of Japanese studies at the Ecole nationale des langues orientales vivantes who had been one of the first fellows of the Maison Franco-Japonaise in 1925, introduced her to nô, a form of theatre that had its origin in the fourteenth century. Combining elements of dance, text, and facial expression, nô attracted the interest of interwar European writers, such as Claudel, Schlumberger, and Copeau.[59] Hackin had organized the tickets, which were "very difficult to get, very rare." For Mayrisch, nô theatre was one of the few things and traditions of "old Japan" that were still alive.[60]

Shortly after her arrival in Tokyo, a "quite serious" earthquake struck one night at around 4 a.m. In a letter to the Columeta main office, Le Gallais related that the quake did not frighten Mayrisch and that she was pleased with

53 Ibid., 252.

54 Ibid.

55 Ibid.

56 Ibid., 396. Tellingly, she did not use the word "Westernized," but opted for "Americanized." This reveals a rather negative attitude toward the United States, which corresponds to the lack of American references in her writing and the absence of Americans from her personal networks.

57 Ibid., 252–53.

58 Ibid., 253–54.

59 Ayako Nishino, *Paul Claudel: le nô et la synthèse des arts* (Paris: Classiques Garnier, 2013), 39–63.

60 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 252. For an elaboration on the European discourse on "old Japan," see Pekar, *Der Japan-Diskurs im westlichen Kulturkontext*, 172–189.

her trip.[61] Still, the earthquake certainly left an impression, as she wrote an entire paragraph on it in a letter to Schlumberger. Mayrisch described the strange movements and sounds of the wooden house as a completely new experience for her, so new that she failed to be frightened at first. Only later did she realize the always present and unpredictable danger of earthquakes in Japan:

> We had the curious experience of a quite strong earthquake about twelve days ago. We woke up at 4 a.m. when we felt—how should I say it?—the floor starting to move, a shaking of the entire wooden house which seemed like a clattering of teeth, a subterranean coming to life of the guts of this old petrified land. Such a strange feeling at first, so very new that it does not even occur to you to be frightened. It is only later that one realizes, like the children in *A High Wind in Jamaica*, 'that one has been in an earthquake,' that one's heart beats faster. This perpetual state of alertness to which one is exposed is also very uncomfortable for the people who live here. The thing is so unpredictable, in terms of space and time, that one has to be constantly prepared.[62]

Although not directly related to old or modern Japanese culture, the earthquake confronted Mayrisch with a peculiar feature of life in Japan.

Mayrisch's second stay in November and December 1934 after the conclusion of the Red Cross conference was suffused by a certain melancholy. She did not mention and apparently did not enjoy the cafés, cinemas, and department stores—the bustling urban life of modern Tokyo. Instead, she escaped to Nara where she spent a week in solitude. She was the only guest in the hotel. "Ville morte," off-season, cold, rain, porous temples: her letters to Schlumberger testify to an atmosphere and mood that were not conducive to her physical and mental health.

Mayrisch's lonely time in Japan in 1934 reflected her search for religious meaning. Mayrisch had a special interest in Buddhism. According to Cornel Meder, Mayrisch's interest in Buddhism marked the beginning of her sense of losing touch with reality, when she turned to religious readings and a search for the meaning of life.[63] She scheduled a meeting with the British diplomat Charles Eliot, an expert on Buddhism.[64] More importantly, she met Suzuki

61 Hugues Le Gallais to Hector Dieudonné, 26 November 1930, ANLux, folder Arbed-02-0401.
62 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 253.
63 Cornel Meder, "Jean Schlumberger et les Mayrisch," *Galérie: Revue culturelle et pédagogique* 18 (2000): 608.
64 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 254.

Daisetsu (often Romanized as Daisetz Suzuki) and his American wife who she described as a "strange couple."[65] Suzuki, a professor at Ôtani University, a private Buddhist institution in Kyoto, was probably the most prominent Japanese academic in Buddhism and well known outside the country. Mayrisch had read many articles of Suzuki; his *Essays in Zen Buddhism* were part of her library; and in 1936, Mayrisch invited Suzuki to London for a conference on religion.[66] Traveling home to Luxembourg in 1935, Mayrisch enthusiastically reported on a three-hour encounter with a young Englishman in Hong Kong, with whom she had talked about Buddhist meditation practices.[67] Mayrisch thus participated in the awakening interest in Zen Buddhism among European intellectuals.[68]

In fact, it was not unusual for European intellectuals of the interwar period to make a trip to Japan. The uneasiness Mayrisch felt about Japan's modernization, or "Americanization," was shared by many European travelers in Japan, including many *NRF* writers and Keyserling. Following the standard tourist itinerary, Mayrisch's trips to Japan were intellectually and personally mediated by orientalists who were interested in old traditions and things. This also influenced her perspective on Japan: She cared about Japanese spirituality rather than about Japan's economy. East Asia was a topic to discuss with like-minded people and with carefully selected Japanese and Chinese intellectuals who had been thoroughly familiarized with Western discourses through their education and at the same time held traditional Japanese culture in high esteem. Mayrisch's view of Japan was distant and patronizing. When she stayed in Japan, she was clearly not part of the Japanese modern world, but retreated to the world of expatriate European intellectuals. She was on a—futile—search for the "old" or "eternal" Japan.

4 Picturing Japanese Women

Mayrisch's papers at the Centre national de littérature in Mersch include about 120 photographs that Mayrisch, together with Le Gallais, took or purchased in Japan (see figs. 3.1–3.3). These images represent a stereotyped vision of

65 Ibid., 396.

66 Ibid., 439.

67 Ibid., 402.

68 In interwar Europe, both liberal intellectuals and those leaning towards National Socialism expressed interest in Buddhism. See Hans-Joachim Bieber, *SS und Samurai: Deutsch-japanische Kulturbeziehungen 1933–1945* (Munich: Iudicium, 2014).

FIGURES 3.1–3.3 Aline Mayrisch and Hugues Le Gallais in Japan, early 1930s. PHOTOGRAPHS. © CENTRE NATIONAL DE LITTÉRATURE, LUXEMBOURG.

Japan.[69] Most of them feature the tourist attractions of Kyoto and Nara. Some photographs show a garden party at the Villa Inabata in Kyoto. There are also postcards of Nagasaki. There are no images of Japanese steel plants.

69 Gennifer Weisenfeld, "Touring Japan-as-Museum: NIPPON and Other Japanese Imperialist Travelogues," *Positions* 8 (2000): 747–93.

The photographs visualize the longing for the "eternal Japan" and the invasion of hypermodernity. One of the recurring motifs is Japanese women, both "traditional" and "modern." One set consists of postcards of women wearing kimonos (see figs. 3.4–3.6). These women represent a number of characteristics: They are short, graceful, pretty, and picturesque—one might even say

FIGURES 3.4–3.6 Postcards of Japanese women in traditional dress, early 1930s.
© CENTRE NATIONAL DE LITTÉRATURE, LUXEMBOURG.

puppet-like.[70] Their aesthetic posing in kimonos makes them appear fascinating and abstract at the same time. They evoke the topos of the geisha that had little to do with the geisha as it actually existed in Japan but rather was a Western umbrella term that epitomized a male longing for exotic eroticism. European women often criticized the figure of the geisha as a subordinate form of womanhood that undermined narratives of emancipation.[71] They were "essentialized for non-Japanese consumers as ultimately, unreachably Japanese."[72]

A second set of postcards shows girls apparently belonging to a female baseball team called "Star Kamata" (see figs. 3.7–3.10). Its name refers to the neighborhood of Kamata on the southern outskirts of Tokyo, the location of the Shochiku film studios, the major film production company in Japan between 1920 and 1936.[73]

Probably in their mid-twenties, the women are heavily made up, wearing their caps loosely over carefully coiffed hair. It is difficult to imagine the women as professional baseball players. They may have been actresses who posed for promotional or entertainment purposes.[74] Was it perhaps the team of actresses that reportedly played against the Philadelphia Bobbies, an American female baseball team that toured Japan in 1925?[75] Baseball was first introduced to Japan in the early 1870s by an American teacher and evolved into the country's most popular team sport.[76] The sport became especially popular with high school and college students. The post-WWI period witnessed the construction of major stadiums, live radio broadcasts, and the creation of a professional league, leading to a "national obsession with baseball."[77] However, baseball became a predominantly male sport. Female baseball players were

70 Gabriele Brandstetter, "'Blumenhaft und schlächterhaft': Japanische Körperbilder in Europa: Rezeption, Projektion, Fiktion in Texten und Bildern der Zwanzigerjahre," in *Ostasienrezeption im Schatten der Weltkriege: Universalismus und Nationalismus*, ed. Walter Gebhard (Munich: Iudicium, 2003), 252.

71 Pekar, *Der Japan-Diskurs im westlichen Kulturkontext*, 273–93.

72 Silverberg, *Erotic Grotesque Nonsense*, 1.

73 One of the photographs (fig. 7) shows the logo of the Shochiku studios in the lower right-hand corner.

74 I am grateful to Sayuri Guthrie-Shimizu who shared her opinion on this issue and to Andrew D. Morris who forwarded me the opinion of Maruyama Masaru.

75 Gai Ingham Berlage, *Women in Baseball: The Forgotten History* (Westport, CT: Praeger, 1994), 41. See also Sayuri Guthrie-Shimizu, *Transpacific Field of Dreams: How Baseball Linked the United States and Japan in Peace and War* (Chapel Hill: University of North Carolina Press, 2012), 124–28.

76 Guthrie-Shimizu, *Transpacific Field of Dreams*, 11–39; Donald Roden, "Baseball and the Quest for National Dignity in Meiji Japan," *American Historical Review* 85 (1980): 511–34.

77 Dennis J. Frost, *Seeing Stars: Sports Celebrity, Identity, and Body Culture in Modern Japan* (Cambridge, MA: Harvard University Asia Center, 2010), 155.

FIGURES 3.7–3.10 "Disastrously Americanized?": The female baseball team Star Kamata, early 1930s.

rare and remained a marginal phenomenon, even though the 1920s saw a shift from calisthenics to competition in women's sports.[78] The Japanese Women's Olympic Games introduced baseball, besides other ball games, in the 1920s, but soon took baseball out of the competition, after a majority of girls' high

78 Robin Kietlinski, *Japanese Women and Sport: Beyond Baseball and Sumo* (London: Bloomsbury Academic, 2011), 49–53.

school principals declared the sport to be "unfeminine" and argued that girls lacked assertiveness.[79]

Still, female athletes represented the "modern girl," a phenomenon that appeared in interwar Japan as in other countries around the world. The "modern girl" represented a challenge to the "good wife, wise mother" (*ryôsai kenbo*), which had epitomized ideal womanhood since the Meiji period. Modern Japanese girls also conflicted with how Europeans would have liked to see Japan and Japanese women. We do not know whether Mayrisch visited the film studios or actually met the baseball team, whether it was a major topic in the conversations she had in Japan, or whether she accidentally stumbled upon these images. Did she regard them with contempt as still another example of excessive Americanization? Or did she see the emancipatory potential of female sports? The Far Eastern Championship Games had an impact on the emancipation of middle-class women and the promotion of new hygienic dress and body styles.[80] In this sense, bodily reform was closely related to public health: Efficient and healthy bodies should eventually benefit industrial production.[81] Was Mayrisch aware that the Yawata Steel Works created a (male) baseball team in 1924 during a major wave of strikes as an experiment in welfare capitalism and social control in order to promote productivity and harmony between capitalists and workers?[82]

The collection also has sexualized undertones. A male trainer is coaching a female team, reflecting a gender hierarchy. The poses of the smiling women are suggestive of sexual promiscuity. In this way they differ markedly from the masculinized images of the sprinter Hitomi Kinue, the first Japanese female athlete to win an Olympic medal in 1928.[83] The fact that baseball, a foreign sport, had been adopted in Japan may also have indicated a civilizational hierarchy in the eyes of contemporary viewers. Sport was seen as a way to overcome the supposed weakness and racial inferiority of Japanese women. In the absence of written sources, it is futile to speculate on the significance of these images for Mayrisch. However, the fact that she brought these photographs back to Luxembourg shows that they intrigued her and carried meaning for her.

79 Kyoko Raita, "The Movement for the Promotion of Competitive Women's Sport in Japan, 1924–35," *International Journal of the History of Sport* 16 (1999): 120–34.

80 Stefan Huebner, *Pan-Asian Sports and the Emergence of Modern Asia, 1913–1974* (Singapore: NUS Press, 2016), 95–99.

81 Takeshi Arimoto, "Training the Female Body: The Rise of Women's Gymnastics and the Discursive Elaboration of 'Bodily Beauty' in Modernizing Japan," *International Journal of Eastern Sports and Physical Education* 3 (2005): 1–15.

82 Allen Guttmann and Lee Thompson, *Japanese Sports: A History* (Honolulu: University of Hawai'i Press, 2001), 132.

83 Frost, *Seeing Stars*, 109–50.

Finally, two photographs in Mayrisch's collection show two Japanese nurses, Inoue Natsue and Tabuchi Masayo (see figs. 3.11 and 3.12). For the photographs, both women are posing at the same spot. They look serious and do not show any emotions.

In East Asia, nurses, in particular Red Cross nurses in uniform, were seen as icons of modernity.[84] As historian Aya Takahashi has noted, nurses appeared to early-twentieth-century Japanese observers as "angels in white uniform"—an expression that put them in a Westernized and Christianized context.[85] The British nursing pioneer Florence Nightingale was well known in Japan and served as a role model. The two photographs show women who appear subservient and subordinate or even timid and passive, as though embodying a sense of mission to which they submitted their personalities. Takahashi reminds us that Japanese nurses in the early twentieth century were regarded as models of efficiency, carefully following rules and regulations to contribute

FIGURES 3.11 AND 3.12 "Natsuye Inouye in outdoor uniform" (left); "Miss Tabuchi, a graduate of Bedford College in London, in in-door uniform" (right), ca. 1934.
PHOTOGRAPHS. © CENTRE NATIONAL DE LITTÉRATURE, LUXEMBOURG.

84 Caroline Reeves, "Developing the Humanitarian Image in Late Nineteenth- and Early Twentieth-Century China," in *Humanitarian Photography: A History*, ed. Heide Fehrenbach and Davide Rodogno (Cambridge: Cambridge University Press, 2015), 131.

85 Aya Takahashi, *The Development of the Japanese Nursing Profession: Adopting and Adapting Western Influences* (London: Routledge Curzon, 2004), 1.

to the well-being of the nation in war and peace. Moreover, Japanese nurses, unlike their European and North American counterparts, did not engage in feminist activities.[86]

In sum, the photographs and postcards of Japanese women—geishas, baseball players, and nurses—show us how Mayrisch appropriated and made sense of Japan and its people. They, too, testify to the tension between tradition and modernity which was a recurring theme in foreign representations of Japan.

5 Representing the Luxembourg Red Cross

For Mayrisch, the 1934 trip to Japan served the purpose of attending the Fifteenth Congress of the League of Red Cross Societies. After the First World War, Japan was a founding member of the League of Nations and was granted great power status. This coming of age of Japan as an international actor was reflected in the hosting of large-scale international gatherings.[87] Bringing together large numbers of foreign visitors, these congresses were without precedent in Japan and played an important part in promoting Japan's global role. In the 1930s, however, a number of events—the Japanese invasion of Manchuria in 1931, the establishment of the satellite state of Manzhouguo in 1932, and the subsequent Japanese withdrawal from the League of Nations in 1933—increasingly reflected the rise of ultranationalism and militarism in Japan.

The forerunner of the Japanese Red Cross had been founded in 1877.[88] It officially joined the Red Cross movement by acceding to the Geneva Convention in 1886, and, one year later, adopted the name Japanese Red Cross Society (Nippon Sekijûjisha). The Japanese Red Cross was closely tied to state bureaucracy and was patronized by the imperial family. The highly official character of the Japanese Red Cross made membership attractive, turning it into a mass organization with one of the highest membership rates in the world. Contemporaries saw the Japanese Red Cross's efficient performance in the Sino-Japanese (1894/5) and the Russo-Japanese (1904/5) conflicts as an indicator of Japan's degree of "civilization." During WWI, the Japanese sent Red Cross detachments to England and France in support of the Allied powers. Organizing the 1934

86 Ibid., 113.

87 In 1929, for example, the World Engineering Congress took place in Tokyo; see *Proceedings: World Engineering Congress, Tokyo, 1929* (Tokyo: Kôgakkai, 1931).

88 Konishi Sho, "The Emergence of an International Humanitarian Organization in Japan: The Tokugawa Origins of the Japanese Red Cross," *American Historical Review* 119 (2014): 1129–153.

congress was undoubtedly another big international success for Japan and its Red Cross Society.[89] The Luxembourg Red Cross, in contrast, was founded only after the outbreak of the First World War in 1914 and received major support from the steel industry.[90]

Writing to Schlumberger from onboard the transpacific steamer to Japan, Mayrisch, however, did not give the impression of looking forward to the conference. In view of the rise of National Socialism in Germany and militarism in Japan, she wrote: "Many participants at the conference (which, I am afraid, will be big and fashionable), with much administrative and futile talk (in the manner of the League of Nations). But, all things considered, one has to remind oneself that it is nevertheless better to have this kind of event than not to have it."[91] There were two representatives of Luxembourg attending the congress.[92] Surprisingly, the one who appeared first on the list was Imaizumi Kaichiro. Imaizumi was the head of Japan's largest private steel mill, Nippon Kôkan Kabushiki Kaisha, and had been serving as Luxembourg's consul general in Japan since 1923.[93] He was the official representative of the Luxembourg government. Mayrisch figured second on the list as a representative of the Luxembourg Red Cross, and she served as one of twenty-three vice-presidents of the conference bureau.[94]

The Red Cross congress was a huge social event. In Mayrisch's papers we find invitations to a host of receptions.[95] The Governor of Kanagawa Prefecture, the Mayor of Yokohama, and the President of the Yokohama Chamber of Commerce and Industry extended a joint invitation to a dinner at the Hotel New Grand in Yokohama on Sunday, October 21. The next day, the Prime Minister, the Foreign Minister, and the Navy Minister received the delegates at the official residence of the Prime Minister. On Tuesday, Baron Iwasaki Koyata, the head of the Mitsubishi *zaibatsu*, and his wife invited the delegates to an

89 Olive Checkland, *Humanitarianism and the Emperor's Japan, 1877–1977* (London: Palgrave Macmillan, 1994).

90 Charles Barthel, *Au service de l'humanité: Histoire de la Croix-Rouge luxembourgeoise 1870–1914–2014* (Luxembourg: Croix-Rouge luxembourgeoise, 2014).

91 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 381.

92 *Croix-Rouge du Japon. XVe conférence internationale de la Croix-Rouge. Siège central de la Croix-Rouge du Japon, 5 Shiba Park, Tokio, 20–29 octobre 1934. Liste des délégués et invités. Deuxième édition. 17 Octobre 1934* (Tokyo: Croix-Rouge du Japon, 1934), 17.

93 On Imaizumi's consulship, see ANLux, folder AE-03188.

94 *Quinzième conférence internationale de la Croix-Rouge, tenue à Tokio du 20 au 29 octobre 1934: compte rendu* (Tokyo: Kokusai Shuppan Insatsusha, 1934), 46.

95 See CNL, L-37, Fonds Aline Mayrisch. We do not know, however, whether Mayrisch actually attended these events.

afternoon party. The following day, the Emperor welcomed the guests for a tea party at the Akasaka Detached Palace. On Friday, the 26th, "Baron and Baroness Mitsui request[ed] the honour of the company of Mrs. S. Anbert [sic] Mayrisch at a reception in honour of the members of the Fifteenth International Red Cross Conference … at three o'clock at the Mitsui Mansion, Tsunamachi Mita, Shiba." On October 29, Prince Tokugawa Iesato received the delegates for a closing ceremony and dinner at the Imperial Theatre (*Tôkyô kaikan*). Finally, on November 6, the conference participants had the opportunity to attend a dinner given by the Governor of Osaka Prefecture, the Mayor of the City of Osaka, and the President of the local Chamber of Commerce and Industry. The involvement of big industry, in the form of the Mitsubishi and Mitsui conglomerates, was similar to Red Cross events in Luxembourg. Furthermore, nô and kabuki theatre performances were arranged for the delegates, and special visits to museums in Tokyo were also part of the program. The social activities also included excursions to Kamakura, Enoshima, Nikkô, and Hakone.[96]

In addition, the delegates inspected schools, hospitals, and nurseries run by the Japanese Red Cross. Anti-tuberculosis measures, which were of special interest to Mayrisch, were also a topic at the congress. In Luxembourg, the Red Cross—together with the Anti-Tuberculosis League—developed into the leading provider of public health services in peacetime. Tuberculosis was the most urgent public health problem among the predominantly male and immigrant workforce in the steel industry. In Japan, tuberculosis was a similarly serious issue, killing at least one million people per decade during the first half of the twentieth century. In the island nation, the disease was contracted mostly by factory girls who worked under harsh conditions in the textile industry and to a lesser extent by military conscripts.[97] In the absence of strong state regulations, leading physicians established the Japan Anti-Tuberculosis League (Nihon kekkaku yobô kyôkai) in 1913. Its vice-president was Shibusawa Eiichi, Japan's leading capitalist and business representative. With support from the state, the League organized educational activities to promote the prevention of tuberculosis, opened dispensaries, and built sanatoriums.[98]

96 *Quinzième conférence internationale de la Croix-Rouge: compte rendu*, 275–78.

97 William Johnston, *The Modern Epidemic: A History of Tuberculosis in Japan* (Cambridge, MA: Harvard University Press, 1995), 4. See also Bernard Thomann, *La naissance de l'Etat social japonais: Biopolitique, travail et citoyenneté dans le Japon impérial (1868–1945)* (Paris: Presses de Sciences Po, 2015); Janet Hunter, "Textile Factories, Tuberculosis and the Quality of Life in Industrializing Japan," in *Japanese Women Working*, ed. Janet Hunter (London: Routledge, 1993), 69–97.

98 Johnston, *The Modern Epidemic*, 232–38.

In her functions for the Luxembourg Red Cross and the Luxembourg Anti-Tuberculosis League, Mayrisch played a major role in organizing the training of the first public health nurses in Luxembourg. It was in this context that Mayrisch met the Japanese nurses Inoue and Tabuchi whose photographs she brought back to Luxembourg. Both belonged to Japan's internationalized nursing elite. Born in 1898, Inoue attended Tsuda College, one of Japan's first higher education institutions for girls. In 1928, she spent a year at the Bedford Womens' Public Health School of the University of London.[99] Tabuchi had enrolled in the same program in 1920; both had been sent to Britain by the Japanese Red Cross.[100] The Japanese Red Cross had started public health nursing in 1914. The nursing school attached to its Central Hospital in Tokyo was one of the two most important nurse training centers in Japan. The other one was the nursing school of St. Luke's International Hospital, also in Tokyo, which was run by the Episcopal Church and, from 1927, was the only Japanese nursing school to be granted official recognition at college level. St. Luke's International Hospital received considerable funds from the Rockefeller Foundation and initiated a series of innovative public health initiatives in and around Tokyo. The institution also welcomed American nurses and sent Japanese nurses to the United States.[101]

During several conference days, the delegates split up into commissions to deal with specific issues. Mayrisch joined Commission III where, under the presidency of a Mrs. Rome from Great Britain, thirty-two predominantly female delegates examined nursing questions. Inoue served as secretary of this commission; another Japanese participant was Hagiwara Take.[102] She had made a name for herself with relief work during the Sino-Japanese and Russo-Japanese wars. Later, she became the matron of a Red Cross nursing school. Hagiwara had visited Europe and attended several international nursing congresses. In 1934, she served as the president of the Nurses' Association of the Japanese Empire.[103] The commission drafted new regulations for the Florence Nightingale Medal, a Red Cross decoration awarded to especially devoted nurses. In addition, it called for the systematic training of nurses and

99 After World War II, Inoue had a political career as a Diet member. See Sally A. Hastings, "Political Representation for Nurses in Postwar Japan," in *Japan Since 1945: From Postwar to Post-Bubble*, ed. Christopher Gerteis and Timothy S. George (London: Bloomsbury Academic, 2013), 107–21.

100 Takahashi, *The Development of the Japanese Nursing Profession*, 104.

101 Ibid., 133–37.

102 *Quinzième conférence internationale de la Croix-Rouge: compte rendu*, 57–58.

103 On Hagiwara, see Checkland, *Humanitarianism and the Emperor's Japan*, 80; Takahashi, *The Development of the Japanese Nursing Profession*, 117.

for national systems for registering graduate nurses. The commission also promoted the role of auxiliary volunteer nurses to be mobilized in times of war or major disasters, specifically referring to and praising the Japanese model.[104]

Finally, religious organizations, too, were active in international public health work. During her visit, Mayrisch also met Anne Bleser, a young woman from Bettembourg who had gone to Japan as a Franciscan sister in 1927 and who worked in a leprosarium at Biwasaki on the island of Kyûshû.[105]

We do not have any evidence whether Mayrisch's trip to the Red Cross congress in Tokyo and her encounters with Japanese nurses or nurses working in Japan influenced her activities back in Luxembourg. Still, it is astonishing to see the similarities in how the problem of tuberculosis, the measures taken to fight the disease, and in particular the deployment of visiting nurses presented themselves in the Grand-Duchy and Japan.

6 Conclusion

East Asia and Japan in particular played a not unimportant role for Luxembourg in terms of economic exchange and cultural appeal during the first half of the twentieth century. Mayrisch's trips beyond Europe, in this case to Japan, were part and parcel of her intellectual and business networks. She traveled as an intellectual and was mostly interested in the traditional culture of Japan. Her interest in oriental philosophies, especially Buddhism, was part of a specific period of her life. Mayrisch wanted to experience a different way of life, a different way of organizing society, probably also a different way of making sense of her own existence and human existence in general. This search was only partially successful. She set out to find the "old" or "eternal" Japan, but what she found was a "disastrously Americanized" country. There is a certain irony in the fact that Mayrisch, as the widow of the president of one of Europe's most powerful steel conglomerates, felt the need to search for an alternative to Western modernity, a modernity that ARBED, among others, was exporting to the world.

It seems that Mayrisch and some of the intellectuals of her circle had initially not been fully aware of the rapid modernization and industrialization of Asia and Japan in particular. For them, Asia was backward, stagnant, and

104 *Quinzième conférence internationale de la Croix-Rouge: compte rendu*, 157–61.

105 Mercier and Meder, *Aline Mayrisch–Jean Schlumberger*, 395–99. In Shanghai, she also visited Catholic sisters from Luxembourg and donated them some money; see Bourg, "Madame Mayrisch et l'Orient," 64.

spiritual, and therefore an antipode to European modernity. This explains their hope to find a cure for what was going wrong in Europe. So their disappointment was all the bigger when they eventually visited Japan and were confronted with its modernity. The most widespread reaction was to perceive a loss of traditional culture and to accuse the Japanese of 'imitation.' Interwar European intellectuals, it seems, were not (yet) capable of appreciating Asia's recent progress as a genuine contribution to modernity.[106]

The intellectual escape from industrial capitalist civilization often resulted in dissillusionment. Indeed, what Mayrisch found in Japan, among other things, was Red Cross officials and industrialists who struggled with the same problems that their Luxembourg counterparts struggled with back home. All of this must be seen as part of the complex process of fabricating modern societies—in Luxembourg, Japan, and other places around the globe.

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106 Only a few Europeans, such as the French politician Georges Clemenceau, saw Japan's modernity as an explicit model for other peoples; see Matthieu Séguéla, *Clemenceau ou la tentation du Japon* (Paris: CNRS Editions, 2014), 432.

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PART 2

Mapping Bodies and Senses

CHAPTER 4

"Sensuous Geographies" in the "Age of Steel": Educating Future Workers' Bodies in Time and Space (1900–1940)

Karin Priem and Frederik Herman

> The Institut Emile Metz seeks to protect the future workers from the current mechanization of labor, by connecting their intellectual, professional, and moral values with the evolution of modern labor.
>
> JEAN-PIERRE AREND, director of the Institut Emile Metz, 1921[1]

• • •

> You will see on the screen the work of the blast furnace operator, the steelmaker, the smelter, the rolling-mill operator, of an entire work world conscious of its value. You will admire the grandeur and the complexity of the industrial organism, where the hand unites with the brain in a harmony that we strive to render as perfect as possible.
>
> NICOLAS WAGNER, mining director of ARBED, 1923[2]

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1 Introduction: Intimacy in the "Age of Steel"

Walter Benjamin, in his *Arcades Project* (1927–1940), used the example of the Parisian *passages couverts* and their iron and glass construction to describe a new feel of urban space and a new mentality that had begun to emerge during the nineteenth century. In a "montage" on "Iron Construction," he noted:

1 Jean-Pierre Arend, "L'Evolution de l'Institut Emile Metz et l'atelier d'apprentissage," in *Institut Emile Metz: Programme publié à la clôture de l'année scolaire 1920–1921* (Luxembourg: Imprimerie Th. Schroell, 1921), 50. Unless otherwise noted, all translations are the authors' own.

2 From Nicolas Wagner's opening speech at the first Luxembourg National Trade Fair in Esch-sur-Alzette in September 1923, cited in Ira Plein, "Machines, Masses, and Metaphors: The Visual Making of Industrial Work(ers) in Interwar Luxembourg" (in this volume).

> It must be kept in mind that the magnificent urban views opened up by new constructions in iron … for a long time were evident only to workers and engineers. … For in those days who besides the engineer and the proletarian had climbed the steps that alone made it possible to recognize what was new and decisive about these structures: the feeling of space?[3]

Indeed, iron and steel not only influenced architecture but increasingly became important drivers of social, cultural, economic, and technological transformations that were explicitly built on the industrial worker, his strong mental attachment to the age of industrialization, and his embodied sensuous-spatial professional knowledge.[4]

In 1930, the German Werkbund, an association aiming to create new lifestyles through promoting aesthetic reform, published *Eisen und Stahl* (Iron and steel), a book that quickly became an icon of industrial photography.[5] Featuring ninety-seven images by the photographer Albert Renger-Patzsch, the book included an introduction by Albert Vögler, at the time chairman of the Vereinigte Stahlwerke, a German industrial conglomerate of several coal, iron, and steel companies. In his text, Vögler stressed the tremendous cultural importance of steel and iron as materials that had come to shape intellectual life, everyday products, architecture, technology, and the economy.[6] In fact, it was Vögler who coined the term "age of steel" (*Zeitalter des Stahles*) to describe the early twentieth century as a distinctly new material world shaped by engineers, architects, designers, artists, industrial workers, and employees, and characterized by evolving new markets and international developments in iron and steel technology enabling mass production, fostering competition between steel-producing countries, and leading to the creation of steel cartels and internationally active companies.[7]

According to Vögler, technological innovation in iron and steel production, together with the collaboration between science and industry after World War I,

3 Walter Benjamin, *The Arcades Project* (Cambridge, MA: Harvard University Press, 2002), 156.

4 See also Karin Priem and Frederik Herman, "Hautnah: Materialität der Moderne und sensomotorische Ansätze der Berufsbildung im 'Zeitalter des Stahles,'" in *Die Sache(n) der Bildung*, ed. Christiane Thompson, Rita Casale, and Norbert Ricken (Paderborn: Ferdinand Schöningh, 2017), 213–40.

5 Albert Renger-Patzsch, *Eisen und Stahl* (Berlin: Verlag Hermann Reckendorf, 1931).

6 Ibid., 1. In 1932, Vögler was one of the industrial leaders supporting Adolf Hitler. See Vera Hierholzer, "Albert Vögler 1877–1945: Industrieller, Politiker," Deutsches Historisches Museum, Berlin, https://www.dhm.de/lemo/biografie/albert-voegler.

7 Renger-Patzsch, *Eisen und Stahl*, 1.

facilitated new ways of using these materials. In his view, the material quality of iron and steel became more and more refined, leading to new dimensions of everyday life: It encouraged the construction of huge buildings and bridges; it supported technological innovation in transportation—be it trains, road vehicles, aircrafts, or ships; it influenced agriculture, the printing industry, electricity generation; it shaped the design and use of everyday objects; and it generally revolutionized all kinds of technologies. Iron and steel fostered the emergence of new textures, new fabrics, new surfaces, new landscapes, new ways of experiencing technology, new ways of thinking, new aesthetic forms, and new lifestyles, all of which affected, and were affected by, the human body and its senses.[8]

Within these newly emerging "sensuous landscapes,"[9] nature, culture, and technology—or, the organic, intellectual, and mechanical worlds—may therefore be better analyzed as interconnected and entangled entities.[10] In other words, the social, emotional, intellectual, and technological worlds are fundamentally intertwined while at the same time shaping and being shaped by bodily-sensory experiences and influencing how people act in the world.[11]

Moving within these emerging industrial landscapes, it was primarily the steel workers who, by using all their senses, established intimate relations with the steelmaking process, the steel products, and the related technologies.[12] This heightened the importance of vocational orientation and training in the "age of steel." In fact, iron and steel production and processing required

8 See Richard Sennett, *Flesh and Stone: The Body and the City in Western Civilization* (New York: Norton, 1994); Tim Dant, *Material Culture in the Social World* (Buckingham: Open University Press, 1999).

9 See J. Douglas Porteous, "Smellscape," *Progress in Physical Geography* 9, no. 3 (1985): 356–78; J. Douglas Porteous, *Landscapes of the Mind: Worlds of Sense and Metaphor* (Toronto: University of Toronto Press, 1990); Paul Rodaway, *Sensuous Geographies: Body, Sense and Place* (Abingdon: Routledge, 1994). "Sensuous landscapes" is our term, inspired by these works.

10 See Hartmut Böhme, "Kulturgeschichte der Technik," in *Orientierung Kulturwissenschaft*, ed. Hartmut Böhme, Peter Matussek, and Lothar Müller (Hamburg: Rowohlt, 2000), 164–78; David Nye, *Technology Matters: Questions to Live With* (Cambridge, MA: MIT Press, 2006); Martina Heßler, *Kulturgeschichte der Technik* (Frankfurt: Campus, 2012).

11 See Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007); Richard White, *The Organic Machine: The Remaking of the Columbia River*, 3rd ed. (New York: Harper Collins, 1997); Mark Paterson, *The Senses of Touch: Haptics, Affects and Technologies*, 2nd ed. (Chichester: John Wiley & Sons, 2012); Paul R. Carlile et al., eds., *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies* (Oxford: Oxford University Press, 2014), 3.

12 See Porteous, *Landscapes of the Mind*; Paterson, *The Senses of Touch*, 4, 6.

proper handling, a specific bodily-sensory approach to industrialization, and a large qualified workforce across the different branches of steel production. Therefore, vocational training had to connect bodies and minds to the industrial environment(s), equip future workers with multi-sensory "embodied experiences,"[13] generate both professional knowledge and "body memory," and thus create truly "knowing bodies."[14] In the context of the steel industry, apprentices acquired skills in sensing and perceiving steel plants, machines, tools, and raw materials, not least by touching them—be it in intimate, or naked, distant, or even "imagined" ways.[15]

Drawing on Paul Rodaway's *Sensuous Geographies*, this essay seeks to explore some features of a hidden and often forgotten "geography of the senses" and to gain insight into the role of the senses in the everyday experiences of apprentices in the steel industry.[16] In other words, it examines how sensing—seeing and hearing but especially touching and feeling—was part of the learning and training activities at a progressive vocational school, how this may have affected the sensory and bodily experiences of the future workers (sensation), and how it may have contributed to their understanding, appreciation, and sense of orientation within the material world (sense making). In doing so, we consider separate yet entangled layers of sensation and "perception," such as the sensorial, emotional, cognitive, and cultural dimensions of "reaching out to the world."[17] Consequently, we assume, with Rodaway, that "perceptual sensitivity is learnt and forms part of … the socialization into a culture."[18]

Our essay focuses on one of the global players in the steel business, the Luxembourg-based Aciéries réunies de Burbach-Eich-Dudelange (ARBED), and its pioneering role in vocational orientation and training through the Institut Emile Metz, a vocational school founded in 1914.[19] We will investigate how the school's curriculum and psychometric techniques envisaged the human body

13 Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses*, 2nd ed. (Chichester: John Wiley & Sons, 2007), 40; Paterson, *The Senses of Touch*, 7, 16, 95.

14 Pallasmaa, *The Eyes of the Skin,* 45, 66.

15 Ibid., 53–54.

16 Rodaway, *Sensuous Geographies*.

17 See Yi-Fu Tuan, *Topophilia* (Englewood Cliffs, NJ: Prentice-Hall, 1974).

18 Rodaway, *Sensuous Geographies*, 22.

19 ARBED, the predecessor of ArcelorMittal, resulted from the merger of several steel producers in 1911: the Société Anonyme des Hauts Fourneaux et Forges de Dudelange, the Société Anonyme des Mines de Luxembourg et Forges de Sarrebruck, and the Société en commandite des Forges d'Eich, le Gallais, Metz et Cie. For further information on the vocational school, its psychophysiological laboratory, its main protagonists, and its relation to social-educational reform, see Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 592–614.

as a prototype seamlessly interacting with new technologies.[20] We will further look at how the psychometric techniques developed in the Luxembourg laboratory were used strategically to educate and train skilled workers—or rather, a workers' elite—by optimizing both their bodies and their use of tools through objectivized observation, measurement, and categorization. In other words, how did apprentices learn professional skills through handling objects, touching materials, and refining their senses and bodies while at the same time being subject(ed) to psychometric testing and training?[21]

In addition, we want to explore how the Institut Emile Metz—by empowering future workers through science-oriented processes that envisaged the human body, its functions, and its senses as an essential element of the industrial-technological landscapes—contributed to the birth of the individual. Our main focus, however, is on the interconnectedness of human bodies, machines/tools, and resources/materials in the context of science-based vocational orientation and training and on the question of how body-sensory and material aspects intersected within the specific "technosphere" of the steel industry in Luxembourg.[22] Psychometric techniques deliberately encouraged active and tacit sensory approaches to education by orchestrating human-material interactions within new structures of time and space in order to foster "the intelligence of the hands,"[23] "haptic memory,"[24] and "embodiment relations."[25]

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20 In the sphere of recreation, the school also focused on training the senses by means of Swedish gymnastics and scout activities. At first sight, these activities may seem to relate to "nature" as a counter-sphere to industrialization, but their prominent position in the wider curriculum of the Institut Emile Metz clearly indicates the involvement of modern "technologies of the body"; see Frederik Herman, Karin Priem, and Geert Thyssen, "Körper_Maschinen? Die Verschmelzung von Mensch und Technik in Pädagogik, Industrie und Wissenschaft," *Jahrbuch für Historische Bildungsforschung* 20 (2014): 47–75.

21 See Carlile et al., *How Matter Matters*, 2.

22 Don Ihde, "The Experience of Technology: Human-Machine Relations," *Philosophy & Social Criticism* 2, no. 3 (1975): 276–79. The term "technosphere" is Ihde's, see ibid., 279. On interconnectedness, see Matthew Jones, "Untangling Sociomateriality," in Carlile et al., *How Matter Matters*, 197–226. The authors would like to thank Noah Sobe for pointing out that, within this context, workers' bodies were seen not only in terms of muscular power but also in terms of fine-tuned sensorial, sensitive, and social bodies.

23 See Richard Sennett, *The Craftsman* (London: Allen Lane, 2008); Klaus Prange, "Erziehung als Handwerk," in "Die Materialität der Erziehung: Kulturelle und soziale Aspekte pädagogischer Objekte," ed. Karin Priem, Gudrun M. König, and Rita Casale, special issue, *Zeitschrift für Pädagogik* 58 (2012): 81–91.

24 Pallasmaa, *The Eyes of the Skin*, 60.

25 Ihde, "The Experience of Technology," 277. See also Lucy A. Suchman, "Embodied Practices of Engineering Work," *Mind, Culture and Activity* 7, no. 1 (2000): 4–18; Lucy A. Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions* (Cambridge: Cambridge University Press, 2007).

Through an in-depth analysis and deconstruction of human-material and socio-material interactions, we hope to shed light on the interrelationship between education and technology in modernity.[26]

In what follows, we will, first, give a brief sketch of the educational program of the Institut Emile Metz. Second, we will elaborate more specifically on the testing and training of the senses. Third, we will have a closer look at one particular test, the filing test, and examine in greater detail the various sensory processes that were pioneered at the vocational school and its psychophysiologal laboratory. Drawing on both textual and visual sources, this paper will conclude with a reflection on how photography—itself a product of optical-mechanical innovation, mechanization, and industrialization—played a major role in presenting and promoting these entanglements, designs, and lifestyles of a brave new world.[27]

2 Hands and Brains: The Rational Organization of Vocational Training

On November 4, 1914, the Institut Emile Metz, located next to the ARBED steel plant in Dudelange, Luxembourg, opened its doors to thirty-two student apprentices. The institute was founded and financed by a foundation with close personal ties to ARBED stakeholders. Its purpose was to educate ARBED's own workforce including the workers' children—the future blacksmiths, locksmiths, lathe operators, planers, electricians, smelters, pattern makers, moulders, and core makers—in order to enhance the quality of production and to continually reproduce a workforce that would be motivated, ambitious, and well integrated into society. By being instructed theoretically and trained practically, by being measured and tested, the apprentices were introduced to a

26 See Herman, Priem, and Thyssen, "Körper_Maschinen"; see also John Shotter, "Reflections on Sociomateriality and Dialogicality in Organization Studies: From 'Inter-' to 'Intra-Thinking'… in Performing Practices," in Carlile et al., *How Matter Matters*, 33.

27 See Lewis Hine, *Men at Work: Photographic Studies of Modern Men and Machines* (New York: Dover, 1977); Barbara Wolbring, *Krupp und die Öffentlichkeit im 19. Jahrhundert: Selbstdarstellung, öffentliche Wahrnehmung und gesellschaftliche Kommunikation* (Munich: C. H. Beck, 2000); Herman, Priem, and Thyssen, "Körper_Maschinen"; Frederik Herman and Ira Plein, "Envisioning the Industrial Present: Pathways of Cultural Learning in Luxembourg (1880s–1920s)," *Paedagogica Historic*a 53, no. 3 (2017): 268–84; Robert Hariman, "Icon, Allegory, Catastrophe: Three Modes of Articulation within 21st Century Public Culture," in *On Display: Visual Politics, Material Culture, and Education*, ed. Karin Priem and Kerstin te Heesen (Münster: Waxmann, 2016), 17–34.

specific "[multi-]sensuous geography," which influenced how they experienced the industrial workplace and industrialized society, how they perceived spatial and material relationships, and how they experienced and perceived the material world surrounding them in the spheres of production and technology (tools, raw materials, workshops, products, etc.).[28] During the three-year training course at the Institut Emile Metz, the focus was on the rational training and testing of the cognitive properties of the brain as well as of the perceptual system of the body (sense organs, muscles, locomotion). Four mornings a week (from 7:30 a.m. to 12:00 noon) were devoted to theoretical education and physical exercises, whereas two mornings (from 7:30 a.m. to 12:00 noon) and six afternoons a week (from 1:30 p.m. to 5:00 p.m.) were reserved for practical work.[29]

The Institut Emile Metz consisted of three "activity centers" (*centres d'action*): theory, practice, and psychotechnics. In 1922—eight years after its establishment—the vocational school was equipped with trade-specific workshops for apprentices and a psychophysiological laboratory. These facilities were designed to offset the disadvantages of vocational training in the factory workshops themselves, as it had taken place during the company's initial years under the supervision of a foreman and experienced workers.[30] The factories themselves were not appreciated as suitable training spaces, since on-the-job training was often disrupted by the unpredictability of factory life and hampered by the low commitment of older workers who were paid for performance and therefore were more interested in increasing their output than in instructing and coaching apprentices. The laboratory, in contrast, made it possible to study and analyze the apprentices' professional skills and their various tasks and subtasks in order to determine and teach the most hygienic and profitable labor performance.[31] After August 1, 1922, the Institut Emile Metz comprised three fully operational components: (1) the vocational school, which provided apprentices with professional knowledge and prepared them for their future roles in a modern society; (2) the workshops, which taught specific work ethics and values; and, finally, (3) the psychophysiological laboratory, where the technical and professional skills of the apprentices were screened, analyzed, and trained while "leading them [i.e., the apprentices] toward maximum individual happiness."[32] The founders and the staff of the vocational school claimed

28 The term is Rodaway's, see his *Sensuous Geographies*, 5.

29 Arend, "L'Institut E. Metz et l'atelier d'apprentissage," 50.

30 ARBED, *Œuvres sociales* (Luxembourg: Victor Bück, 1922), 46.

31 Ibid., 47.

32 Ibid., 42.

that these three *centres d'action*, individually and in concert, would not only help the future workers to smoothly adapt to their jobs but also help to solve the social question.[33]

Approximately fifteen hours a week were devoted to theoretical instruction and physical education.[34] Theoretical instruction was designed to foster the individual development of the apprentices, allow them to orient themselves in modern society, and gain insight into the various production processes, including the most basic handling of tools and raw materials. The first three semesters were mainly devoted to general instruction (e.g., languages, history, mathematics, physics, freehand drawing), while from the fourth semester onward more specialized courses were taught (e.g., technical arithmetic, engineering, metallurgy, electricity, mechanics, iron foundry work, technical drawing). It is worth mentioning that drawing was a mainstay of the curriculum and that the apprentices were instructed in different disciplines of drawing. During the first two years of training, they had to take arithmetic, drawing, and freehand drawing lessons. Freehand drawing focused on exercises based on aesthetics, memory, imagination, and observation.[35] Technical drawing was introduced in the third year and included training in the use of symbols, scales, and conventions of display. Additional emphasis was put on the development of spatial imagination, visualization, perception, and memory as well as on geometrical features and dimensions. In addition, visual thinking was trained by asking apprentices to cut geometric solids by a plane and draw longitudinal and cross-sections of these objects. Physical education (rational Swedish gymnastics and swimming) was essential, as a healthy condition was seen as conducive to a stable character and a well-balanced mind. Through this curriculum—which included aesthetic, moral, and social elements—the Institut Emile Metz aimed for the "total formation of the worker" (as opposed to the creation of *"demi-savants"*). It sought to produce model workers who, as

33 Ibid., 47.

34 For more detailed information about the institute's three-year curriculum, see *Institut Emile Metz: Programme publié à la clôture de l'année 1917–1918* (Luxembourg: Imprimerie Universelle Linden & Hansen, 1918), 63–64; see also ARBED, *Œuvres sociales*, 49–52.

35 *Institut Emile Metz: Programme publié à la clôture de l'année 1917–1918*, 63–64. The curriculum in drawing, like in other subjects, seems to have undergone slight changes over time; see *L'Institut Emile Metz (1914–1954)* (Luxembourg: Imprimerie Bourg-Bourger, 1954), 143–44. For Gottfried Boehm, drawing in particular is "closely connected with all processes of grasping reality"; drawing can be said to touch the eye and the mind while being based on a specific sensory connection between the hand, a drawing tool, the mind, and the eye that cannot be replaced by any other form of (re-)presenting the material world; see Gottfried Boehm, *Wie Bilder Sinn erzeugen: Die Macht des Zeigens*, 2nd ed. (Berlin: Berlin University Press, 2007), 143–44.

an elite, would appreciate the value of their "ennobling" labor[36] and would, as it were, fall in love with their machines and tools while developing "the intelligence of their hands,"[37] "haptic memory,"[38] and "embodied relations."[39]

In the workshops—"where the eyes and hands are trained while being guided by the brain"[40]—the apprentices were taught how to handle and use tools and measuring equipment, such as files, rulers, triangles, center punches, scraping knives, etching needles, hammers, bench-vises, saws, and drills. The apprentices' correct body posture, appropriate use of physical strength, and keeping to a regular and natural rhythm were rigorously scrutinized and drilled with a view to obtaining the most economical performance without wasting human energy. The apprentices were also instructed to manufacture their own tool sets, which can be interpreted as a kind of transition ritual and a sign of taking ownership of their future work. During the first six months in the workshop, all apprentices, with the aid of a file, a ruler, and a triangle, built a rectangular prism: a square prism which, with the aid of a bigger toolkit, was then transformed into a hexagonal prism used to make bolts. Transforming a cylindrical piece into a square prism with the aid of a hammer and a graver was part of the curriculum of the second semester of the first year. At this point the apprentices made their own tools (e.g., turnkeys, bench-vises, caliper compasses) and got involved in the production processes. This continued during the third and fourth semesters. The apprentices also executed small (repair) jobs on demand. At the same time—and irrespective of their future trade—they were introduced to smithery (during a six- to eight-week training at the forge); soldering work (during a series of practical courses), workbench work, planning, and grinding (with simple machines). During their last year of training, a lot of time was spent on the factory floor. The apprentices' performance on the job was meticulously recorded in personal journals and regularly checked by the head of the apprentice workshop. In addition to this general program, the school also offered a variety of trade-specific programs (e.g., for blacksmiths, locksmiths, lathe operators, planers, electricians, smelters, pattern makers, molders, and core makers).

Testing in the laboratory was seen as key to obtaining a precise and complete picture of the apprentices' senses, muscular system, physical and mental

36 ARBED, *Œuvres sociales*, 51.

37 See also Sennett, *The Craftsman.*

38 Pallasmaa, *The Eyes of the Skin*, 60.

39 See also Ihde, "The Experience of Technology."

40 Jean Renard, "Une visite à l'Institut Emile Metz," *Bulletin international—Bureau international des fédérations nationales du personnel de l'enseignement secondaire public* 5 (1922): 84.

abilities (*aptitudes*/*facultés*) in order to help them choose the occupation that suited them best.[41] Central to this approach was a strong belief in adaptability and trainability (*la faculté de l'adaption au travail*/*Übungsfähigkeit*), which included measuring whether and to what extent an individual, with a specific hereditary disposition, could adapt to the specialized requirements of the industrial sphere of production and acquire specific skills. In 1922, the annual report of the Institut Emile Metz explicitly mentioned that workers should be guided by their muscular sensations, their visual acuity, and the tactile sensibility "in their fingertips."[42] In the next section, we will now turn to an exploration of the entangled ways in which the apprentices' senses were thus tested and trained.

3 Progressive Testing of the Senses: Fabricating Sensuous Geographies

It is necessary to distinguish three types of tests that during the 1920s were applied to measure and train the senses.[43] The first series of tests focused on individual senses, more specifically on the acuity, reaction speed, and fatigue of seeing, touching, and hearing (*aptitudes psycho-physiologiques*). A second series took a multi-sensory approach to test the perceptual system of the body and train the coordination of different senses. The last category dealt with job-specific skills (*aptitudes professionnelles*). The testing and training of the different sense organs in the laboratory and workshops thus followed a progressive structure and aimed at a meticulously designed and interconnected map of entangled sensations and perceptions.

3.1 *Seeing, Hearing, and Touching*

The testing and training of the senses (*aptitudes psycho-physiologiques*) focused on seeing, touching, and hearing. The testing of seeing as a distinctive

41 See Nicolas Braunshausen, "Psychologische Personalbogen als Hilfsmittel der Pädagogik und der Berufsberatung," in *Institut Emile Metz: Programme publié à la clôture de l'année scolaire 1917–1918*, 21; Aloyse Robert, "La psychologie appliquée au service de la formation professionnelle et du travail," in *Institut Emile Metz—Lycée Technique Privé Emile Metz (1914–1954)* (Luxembourg: Imprimerie Bourg-Bourger, 1954), 45–83; ARBED, *Œuvres sociales*, 27.

42 *Institut Emile Metz: Programme publié à la clôture de l'année scolaire 1921–1922* (Luxembourg: Imprimerie Th. Schroell, 1922).

43 Some of the tests used in the laboratory were developed at the Institut Emile Metz itself, and their findings were extensively reported at several international conferences (e.g., in Paris in 1927, Utrecht in 1928, and Barcelona in 1929); see Herman, "Forging Harmony in the Social Organism."

sense (*examen de la vue*) was based on an arrangement of different devices. Here, the apprentice had to look at a photographic aperture while putting one finger on a tapping key (*tambour manipulateur*) and tap the button as soon as he saw the light coming through the aperture. The observer's role was to rotate the cylindrical recorder (*cylindre enregistreur*) with one hand while opening the aperture with the other hand, which subsequently projected a cone of light and simultaneously transmitted a signal to the recorder. The recorded track of the test comprised two different marks: one indicated the opening signal (that is, the moment when the test person could see the light) and the other marked the reaction time (that is, the moment when the test person tapped the tapping key). The time between the two marks was registered in hundredths of a second and represented the (simple) visual reaction time. The graph also indicated the tapping pressure (soft or hard) applied by the test person; this presumably provided information on the candidate's motor skills, with the reaction time thought to reveal a hesitant or decisive character. The next test measured the conscious reaction time. Here, the projected light was either red or blue, and the apprentice had to either tap a red key with one finger of his right hand or a blue key with a finger of his left hand. The test thus measured not a simple reflex but the ability to discriminate between colored lights, to remember the color-coded keys, and to correctly select the corresponding key. In sum, these seeing tests were designed to gain insight into the specific mental and psycho-motoric abilities of the test person.

The hearing test (*examen de l'audition*) and assessment of touch were also done with the aid of a psychograph and followed a similar procedure.[44] Hearing, too, was tested through the use of fingertips. In a simple test, the apprentices were asked to tap a key as soon as they heard a sound.[45] A second hearing test focused on the sounds of rotating machines operating at different speeds. The test examined the ability to recognize—by means of sound—the variations of a running machine by using a rotating cylinder whose speed could be adjusted by the person administering the test. The manipulated changes in speed were noticeable within a fifth of a second and marked on the cylinder; the test persons responded by tapping on a Marey's tambour, and their responses were recorded through corresponding marks.[46] In one of the touch

44 See Aloyse Robert, "La méthode psycho-physiologique du travail et l'orientation professionnelle," in *Institut Emile Metz: Programme publié à la clôture de l'année scolaire 1919–1920* (Luxembourg: Imprimerie Joseph Beffort, 1920), 53–71.

45 Ibid., 64.

46 Aloyse Robert, "L'orientation professionnelle pratiquée à l'Institut E. Metz de Dommeldange (Luxembourg)—Rapport presenté par M. Robert à la 3me section—Conférence internationale de psychotechnique de Barcelone (Septembre 1921)," in *Institut Emile Metz: Programme publié à la clôture de l'année 1921–1922*, 80–81.

exams (*examen du toucher*), the test person had to put the index finger of one hand on a drum while placing the index finger of the other hand on another drum. As soon as he felt that the observer was touching one of the drums, he had to respond by tapping on the same drum with one of his fingers.[47] A second test focused on materials. The 1922 annual report of the institute explicitly mentioned touch-exams that tested the blindfolded apprentices' capacity to sense the different textures and surfaces of materials like steel with their "naked" hands and to capture and classify the surfaces' different degrees of roughness.[48] Another test involved arranging several sets of small wooden geometric solids in sets of the same shape and size simply by touching them.[49]

3.2 *The Hand and the Eye*

The systematic testing and training of the hand and the eye aimed at the perceptual system of the body and the coordination of the senses.[50] The sensory training provided for the apprentices of the Institut Emile Metz was designed to enhance their haptic memory and help them perceive embodied relations. One of the tests consisted of bending iron wires with bare hands into a given shape. The test made apprentices experience the quality and flexibility of iron. The activity was repeated five times to check the apprentices' ability to anticipate the material quality and acquire manual dexterity.[51] Another test focused on perforating paper strips by punching holes in a grid structure as quickly and accurately as possible, a test that was repeated ten times. This test has been photographed—presumably, as can be inferred from the deliberate staging and configuration of the equipment, to demonstrate its design and functioning at conferences: The photograph (see fig. 4.1) shows the test person moving the paper strip with one hand and punching the holes as accurately as possible. In the center of the image we see the cylindrical recorder, registering the time to perform the test (length of the graph), the punching rhythm, and the power used to push down the punch. Another image (see fig. 4.2) displays the recording devices as well as the test results of two trials, with the lower graph showing a steady and powerful performance.

Another test was designed to evaluate the coordination of the hands. The test person was asked to move along a given track as quickly and accurately as

47 Robert, "La méthode psycho-physiologique du travail," 64.

48 Robert, "L'orientation professionnelle pratiquée à l'Institut E. Metz," 80.

49 Ibid.

50 Aloyse Robert, "Recherches sur l'entrainement et l'éducabilité au point de vue professionnel," *Revue de la science du travail: Psychotechnique et organisation* 1, no. 2 (1929): 233–54.

51 Aloyse Robert, *Berufliche Ausbildung auf psychotechnischer Grundlage* (Luxembourg: Gustave Soupert, n.d.), 15.

FIGURE 4.1 Perforating test in the laboratory of the Institut Emile Metz.
© INSTITUT EMILE METZ. CNA COLLECTION.

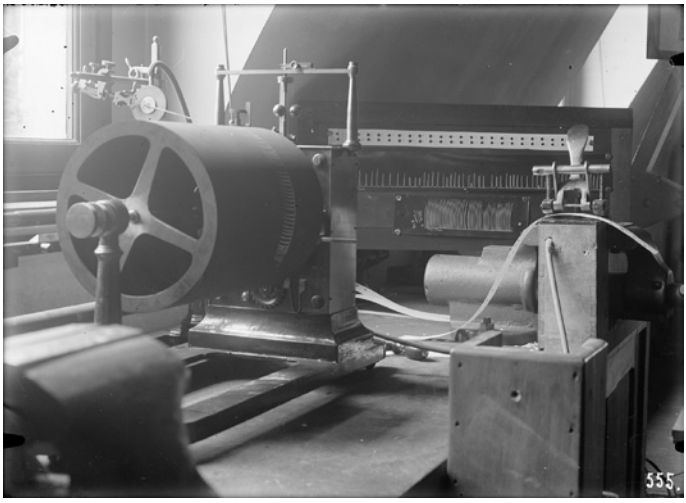


FIGURE 4.2 Recording devices and test results of the perforating test. Digital positives from glass plate negatives.
© INSTITUT EMILE METZ. CNA COLLECTION.

possible by steering a mobile platform with the aid of a two-hand coordinator (*appareil neuromusculaire,* or *Zweihandprüfer*). This procedure was repeated forty-eight times. One of these devices as well as the given track can be seen on the right side of figure 4.3. Another coordination test was a reaction exercise at the turning lathe, where apprentices had to screw a bolt in or out of a screw thread that was either in rest or in motion. This exercise had to be performed

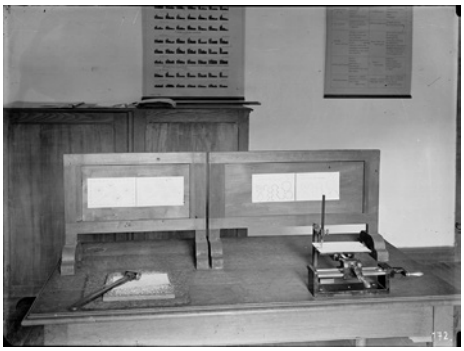


FIGURE 4.3
Coordination test with a two-hand coordinator (*Zweihandprüfer*) and a given track in the background. Digital positive from glass plate negative.

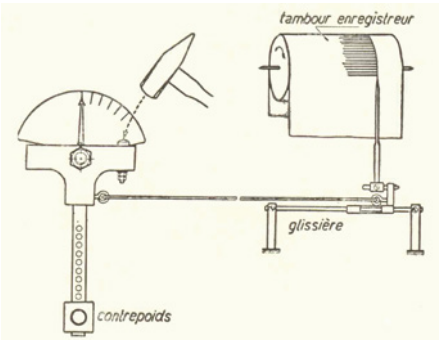
eighty times with a steady hand without slipping off the screwhead. Finally, some tests involved typing or copying a text with two index fingers, with rising levels of difficulty, or assembling dispersed pieces of building blocks. All exercises were recorded as graphs, and their repeated execution was designed to find the best possible rhythm of movement and coordination of senses. While some of these tests and exercises had little to do with the tasks the apprentices would have to perform in their future jobs, there were also job-specific tests and exercises.

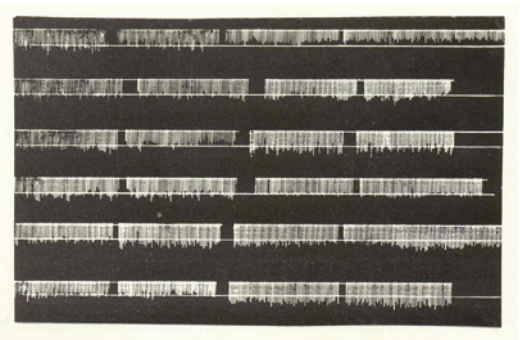
3.3 *Occupational Skills: Hammering and Filing*

The third series of testing and training was dedicated to work- or job-related skills (*aptitudes professionnelles*). The training of "perceptual sensitivity" in connection with work-related skills was a central component of the curriculum of the Institut Emile Metz. Besides filing and hammering, activities like forming, drilling, carving, folding, and bending were seen as essential and were performed with different tools and raw materials.

The hammering test focused on the kinesthetic sense. The kinesthetic sense (muscles and joints) was tested by hammer blows that the test person was to exert with equal force on a mobile object (*Moede device*, see fig. 4.4), registering differences in the rhythm and force of the blows. The test person first beat the hammer several times while checking the movement of a needle. Then he had to continue to strike, if possible using the same force, without looking at the needle. Figure 4.5 shows the test results for twelve apprentices, displaying two series of strikes for each apprentice (from right to left). The horizontal line makes it possible to compare the amplitude of the recorded hammer blows.[52]

52 Robert, "La psychologie appliquée au service de la formation professionnelle et du travail," 72.





FIGURES 4.4 AND 4.5 Hammering test and graphs. Reprinted from Robert, "La psychologie appliquée au service de la formation professionnelle et du travail" (1954), 72.

The filing test was one of the most refined testing and training methods at the Institut Emile Metz (see fig. 4.6). It addressed different forms of touch by also training the coordination of other senses and rehearsing a sophisticated rhythm. During the filing test,

> the body needed to be upright, flexible and positioned at an exact distance from the vise, the latter placed at the level of the navel. The feet had to be positioned at a specific angle, and the heels at a precise distance. The left arm was supposed to be completely extended and exert slightly greater pressure on the tool than the right arm. The file's movements were to take the form of an effortless gliding back and forth, the rhythm of which was expected to correspond to a predetermined count per minutes.[53]

Materials were touched in different ways, while their materiality, in turn, led to different experiences of touch: The apprentice's right hand had to grip the wooden handle to fixate the file. In fact, the touch of steel was experienced through the flesh of the hand *and* through the extension of the body via the

53 Herman, Priem, and Thyssen, "Körper_Maschinen?," 58–59. For more background information, see ARBED, *Œuvres sociales*, 54; V. Neyens, "La psychologie appliquée au service d'une école et de la formation professionnelle," in *Institut Emile Metz—Lycée Technique Privé Emile Metz (1914–1989)* (Luxembourg: Imprimerie Saint-Paul, 1989), 97–109; Aloyse Robert, "Coup d'oeil rétrospectif sur 40 années d'activité de l'Institut Emile Metz," in *L'Institut Emile Metz (1914–1954)* (Luxembourg: Imprimerie Bourg-Bourger, 1954), 21–42; Robert, "La psychologie appliquée au service de la formation professionnelle et du travail," 50; Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (Berkeley: University of California Press, 1992), 186.

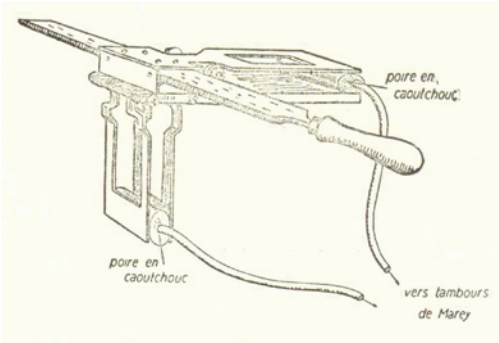


FIGURE 4.6
Filing test. Reprinted from Robert, "La psychologie appliquée au service de la formation professionnelle et du travail" (1954), 70.

FIGURES 4.7–4.9
Filing tests and training at the institute's psychophysiological laboratory and workshops. Digital positives from glass plate negatives.
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wooden handle and the file itself, offering different sensory experiences by means of different materials: (1) by touching steel with the skin, (2) by extending the body and touching the surface of steel through the wooden handle of the file, and (3) by touching steel with a file. The material world and the sensuous cosmos of modernity were thus experienced in simultaneous yet diverse ways and optimized by further training.

Figures 4.7–4.9 show how the experimental settings of the psychophysiological laboratory were translated into educational practice. A progressive and systematic approach to the testing and training of the senses fostered the creation of new "[multi-]sensuous geographies" with the aid of an elite of workers. In sum, "intimate sensing"—that is, active and tacit human-material interactions along with emotional and intellectual engagement—played a key role in examining, selecting, and training the apprentices of the Institut Emile Metz for their future work.[54] The precise and efficient handling of tools and materials as well as the training curriculum were designed to help create social, emotional, sensory, and mental dispositions, which in turn were to have positive effects on the workplace in particular and industrial societies in general.

4 The Touch of Steel and the Rhythm of Modernity

In this section, we will take a closer look at the filing test and illustrate in greater detail the various sensory processes that occurred during the testing and training procedures. We thus want to gain more insight into the feelings provoked by human-material entanglements, and into how "touch" was experienced and observed in this context. In other words, we will investigate how apprentices were encouraged to develop bodily-sensory engagement with the technosphere in order to "learn new ways of relating themselves to the material world."[55] Touch has often been labeled as "the mother of the senses," and includes a wide variety of "tactile senses," such as "pressure, pain, temperature, and muscle movements."[56] In addition, touch—like other sensory perceptions—is said to help us "perceive objects we manipulate" and interact with.[57] Touch is also said to help us build intimate physical and bodily relationships with the material world and to develop sensible knowledge.[58]

54 See J. Douglas Porteous, "Intimate Sensing," *Area* 18, no. 3 (1986): 250; David Howes, "Architecture of the Senses," in *Sense of the City: An Alternate Approach to Urbanism*, ed. M. Zardini (Montreal: Canadian Centre for Architecture; Baden, Switzerland: Lars Müller Publishers, 2005), 322–32.

55 Shotter, "Reflections on Sociomateriality," 32.

56 See Herman, Priem, and Thyssen, "Körper_Maschinen"; Priem and Herman, "Hautnah."

57 See Tiffany Field, *Touch* (Cambridge, MA: MIT Press, 2001), 83; Bruno Latour, *Eine neue Soziologie für eine neue Gesellschaft: Einführung in die Akteur-Netzwerk-Theorie* (Frankfurt: Suhrkamp, 2010).

58 Silvia Gherardi and Manuela Perrotta, "Doing by Inventing the Way of Doing: Formativeness as the Linkage of Meaning and Matter," in Carlile et al., *How Matter Matters*, 238ff.

The filing experiment in the laboratory of the Institut Emile Metz was based not only on sophisticated eye-hand coordination, but also on precise body movements. Drawing on Richard Sennett's work, we suggest that it is the rhythmic movement of the hand that creates positive emotions, activates the body, motivates the mind, and connects the human body with technology and the material world.[59] This connection is the result of a neuronal network in the body that integrates touch with other human senses (such as vision) in a mode of anticipation or "prehension."[60] Filing, as it was experienced by the apprentices of the Institut Emile Metz, could generate a rewarding effect through minutely differentiating between different levels of speed, strength, grip, touch, and tapping.[61] In addition, the sensorial effects of the material itself could create pleasure and satisfaction.[62] Indeed, the filing experiment not only hinted at optimizing the worker's body but also at the perfect match, or combination, of mind, memory, and emotions within the future worker's body. Both the training of the senses and related emotions were to be connected to the mind and thus experienced as part of a learning process that focused on the perfection and conscious optimization of touch. By connecting senses, emotions, and the mind in optimized ways, future workers were trained to become agents of societal transformation and promoters of a specific work ethos.[63] With Foucault, one could even argue that the experimental equipment of the psychophysiological laboratory was a "medium" that could transform "logos" into "ethos."[64] Apprentices experienced this intellectual and ethical transformation process as an innovative, progress-oriented, and complex sensorial training that not only included measurable, active but also rather intuitive, reactive components.[65]

Don Ihde, in his article on "The Experience of Technology: Human-Machine Relations," posits that touch can also be analyzed as "a distant sense."[66] Indeed, the filing experiment stimulated various distant as well as "naked" experiences with steel and iron.[67] On the one hand, steel and iron were experienced

59 Sennett, *The Craftsman*, 201–39.
60 Ibid.
61 Ibid., 235; see also Gherardi and Perrotta, "Doing by Inventing the Way of Doing," 238; Constance Classen, *The Book of Touch* (Oxford: Berg, 2005), 401–2; Dorinne Kondo, "Polishing Your Heart: Artisans and Machines in Japan," in Classen, *The Book of Touch*, 409–11.
62 See Sennett, *The Craftsman*, 235; Paterson, *The Senses of Touch*, 30–32.
63 See Paterson, *The Senses of Touch*.
64 Michel Foucault, *L'Herméneutique du sujet: Cours au Collège de France, 1981–82* (Paris: Editions de l'Ecole des Hautes Etudes, Editions Gallimard, Editions du Seuil, 2001), 312.
65 See Paterson, *The Senses of Touch*, 30–32; Rodaway, *Sensuous Geographies*.
66 Ihde, "The Experience of Technology," 271.
67 Ibid.

distantly through the wooden handle of the file. On the other hand, steel and iron were observed or felt "nakedly" by touching these materials with the bare hand. The focus of action—that is, the proper treatment of steel and iron—therefore was experienced in different ways. Both the file and the hand were different yet equally important means to experience the rough or smooth qualities of various surfaces. By using the file, an extension of the body, the touch of steel was experienced in a mediated way. Here, steel was experienced sensually through the tool and thus connected to the human body and the materials through an "embodiment relation."[68] In an experimental, psychophysiological setting, this relation not only enriched and amplified the sensory, emotional, and intellectual experience of touching steel and iron but also intensified the apprentices' attachment to the logos and ethos of the age of steel as they continued to utilize traditional tools, such as files.

At a time when science found its way into vocational orientation and training, new forms of observing touch emerged. During the filing experiment, the apprentices' movements were electronically recorded on paper: The touch of steel became a visible pattern. In the case of the filing test, a dynamographic file as well as the recording tools acted as interconnected technologies to observe touch by electronic-visual means. In other words, touch became visible through technologies of recording and display (e.g., the movement of the needle during the hammering test), which could be described as touching from a distance or, more concretely, as touching with the mind. We have, in sum, discussed different forms of touch: naked touch, which refers to touching via the skin; distant or mediated touch, which involves a tool or other technologies; a third form of touch refers to the mind (reasoning and imagination); and a fourth and final kind refers to emotional touch (being touched). We would, therefore, like to argue that an exploration of sensuous geographies should also involve looking at their entanglement with geographies of knowledge and emotions.

5 Conclusion: Intimacy and Belonging

The establishment of the psychophysiological laboratory at the Institut Emile Metz marked a milestone in vocational orientation and training at a time when the collaboration between science and the metallurgical industry brought about tremendous changes in architecture, technology, the economy, and intellectual life. The emergence of new textures, new fabrics, new surfaces,

68 Ibid.

and new landscapes triggered new lifestyles, new ways of thinking, new aesthetic experiences, and new "sensuous geographies" that were also extensively covered and commented on by the media (see fig. 4.10). The training of skilled industrial workers was a key component of these transformation processes. In Luxembourg, the Institut Emile Metz became a showcase for new pathways

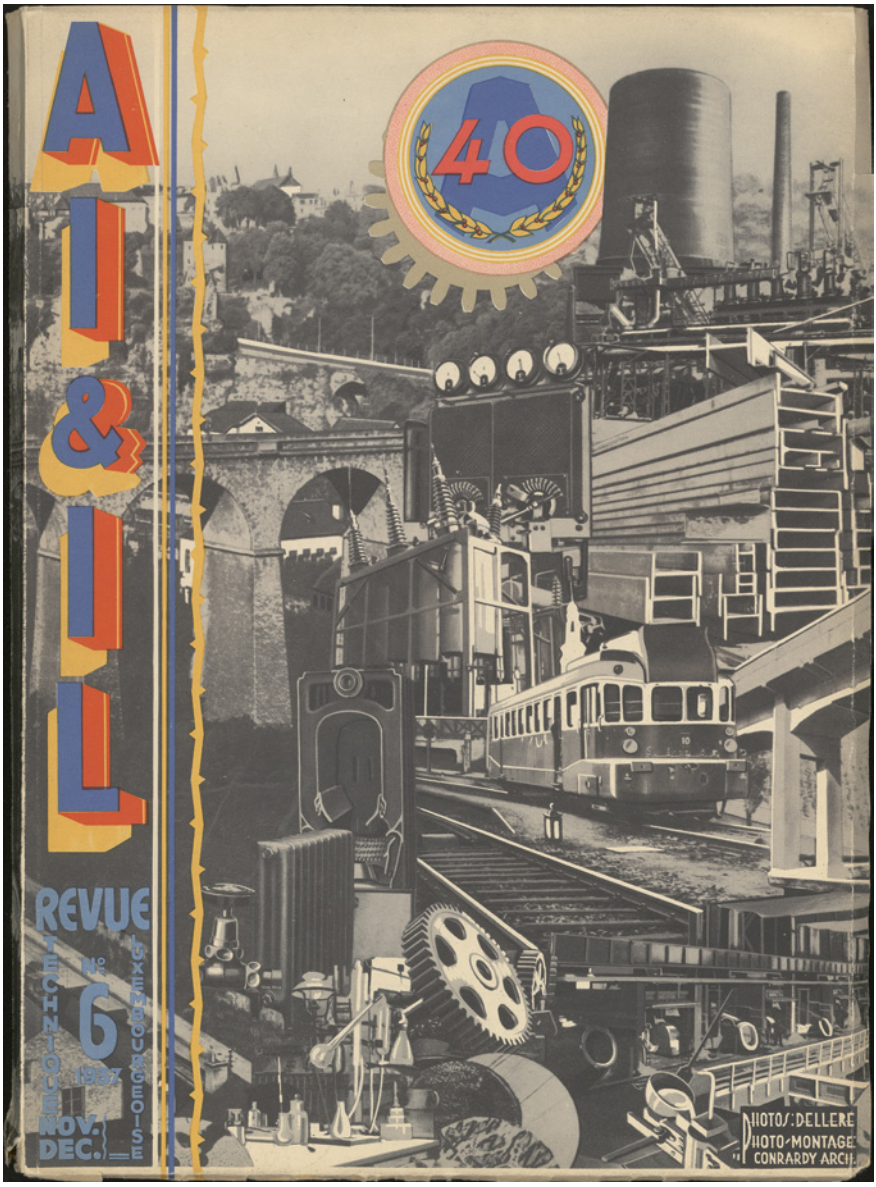

FIGURE 4.10 Cover image of *Revue Technique Luxembourgeoise* 29, no. 6 (November 1937).

to vocational orientation and training. At the institute's psychophysiological laboratory, experimenting, testing, measuring, and training forged an alliance with educational reform, with all these activities forming the human body, its functions, and its senses into a prototype that was designed to perfectly interact with the new technologies and materials.

Psychometric techniques, we have argued, encouraged active and tacit approaches to education and aimed at connecting sensory training with emotional well-being and mental attachment to the "technosphere" of industry. The interactions between humans, materials, and technologies were experienced in various ways, be it "naked" or distant, thus creating "embodied relations" within the "technosphere" of modernity and influencing the "navigation of feeling."[69] We therefore want to suggest that in the sphere of industrial production—even more than in traditional craftsmanship—sensory learning processes encoded moral values and feelings of ownership rather than alienation. From a critical perspective, one could argue that these material-sensory processes also testify to emotional subordination or dependency.[70] In any case, it may be appropriate to refine Marxist alienation theories by including body-sensory dimensions when analyzing the effects of industrial production and the training of an elitist work force.[71]

One medium that may be helpful in this endeavor is photography. Many photographs taken in the context of the Institut Emile Metz show workers touching the machines and gigantic products of the steel industry with their naked hands in a gesture of intimacy, pride, and professional agency (see figs. 4.11 and 4.12).[72] Consequently, photography, very much like the visual display of testing and training results, can be described as another technology of touch that has the effect of being present at a distance.[73] The sense of intimacy and belonging to the technosphere is grounded in embodied relations and sensory-spatial experiences, which in turn were fostered by the visualization, reproduction, and circulation of photographic images. As agents of the "age of steel" and tools of industrial promotion campaigns, photographs were meant

69 William M. Reddy, *The Navigation of Feeling: A Framework for the History of Emotions* (Cambridge: Cambridge University Press, 2001).

70 Gherardi and Perotta, "Doing by Inventing the Way of Doing."

71 See, e.g., Bjørnar Olsen, "Reclaiming Things: An Archaeology of Matter," in Carlile et al., *How Matter Matters*, 175; Philipp Blom, "Forces Unbound: Art, Bodies, and Machines after 1914," in *Nothing but the Clouds Unchanged: Artists in World War I*, ed. Gordon Hughes and Philipp Blom (Los Angeles: Getty Publications, 2014), 4–14; Gordon Hughes, "'In Dead Men Breath': The Afterlife of World War I," in Hughes and Blom, *Nothing but the Clouds Unchanged*, 15, 21.

72 Paterson, *The Senses of Touch*.

73 Ibid., 127.

FIGURE 4.11 Worker sitting on a part of a hydraulic turbine.

FIGURE 4.12 Workers touching machines. Digital positives from glass plate negatives.

to forestall negative thoughts and feelings about mass production and inhumane working conditions.

In addition, the smooth surfaces, impressive sizes and shapes of the steel machinery and products displayed in the photographs refer to a hidden knowledge that was presumably accessible to the workers only. Indeed, touch in its many different forms brought the workers and the products of the steel industry into close proximity and possibly evoked emotions that were based on embodied relations and tactile-spatial experiences. Touch, as displayed in the photographs, may indeed encompass "the affective, the emotional, … or more metaphorical meanings of touch"[74] that could be seen as "archaic" or even "private."[75] As we have shown in this essay, the experience of the flesh—the hand or the body—played a major role in the "age of steel" and its educational reform efforts. It is commonly thought that touch lost some its value and importance with the emergence of the machine age, when compared with traditional craftsmanship. This paper, however, posits the creation of intimacy between humans and technology. Even if the workers' touch was frequently labeled as automatic, it cannot be described as unfeeling.[76]

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74 Ibid., 3.

75 Pallasmaa, *The Eyes of the Skin*, 16. See also Schweizerisches Nationalmuseum, ed., *Arbeit/Le Travail: Fotografien aus der Schweiz 1860–2015/Photographies provenant de Suisse 1860–2015* (Zurich: Limmat Verlag, 2015); Paterson, *The Senses of Touch*, 31–33.

76 See Constance Classen, *The Deepest Sense: A Cultural History of Touch* (Urbana: University of Illinois Press, 2012), 180.

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CHAPTER 5

The Eye of the Machine: Labor Sciences and the Mechanical Registration of the Human Body

Frederik Herman and Karin Priem

1 Introduction: "The New Messiah" in a School Attic

A few years after our first visit to the Lycée Technique Privé Emile Metz, we visited the school again in the spring of 2017. Established in 1913/14, the Institut Emile Metz (as it was called at the time) soon evolved into a progressive and prestigious school for vocational education and professional training. Our second visit to the school was very rewarding, as the renovation work that was underway allowed us to explore parts of the premises that had not been accessible to visitors before. During our first visit in 2013, we had discovered an ergometric bicycle (see fig. 5.1) in the school's attic. The second exploration revealed a few more objects that had once belonged to the school's psychophysiological laboratory and exhibition room, including a mercury manometer and two

FIGURE 5.1 Ergometric bicycle in the attic of the Lycée Technique Privé Emile Metz. PHOTOGRAPH. © FREDERIK HERMAN.

FIGURE 5.2 Mercury manometer (front) and two cylindrical recorders. Spring 2017. PHOTOGRAPH. © FREDERIK HERMAN.

cylindrical recorders (see fig. 5.2) as well as a sophisticated scale model of the labyrinthine school building.[1] The school's psychophysiological laboratory had also left behind other material traces, including a huge glass plate collection containing a staged photograph of the laboratory equipment "at work" in the 1920s (see fig. 5.3). Dating back to the early days of the institute, these almost "forgotten" pieces of the school's educational heritage were emblems of the age of industrialization, mechanization, and frantic scientific developments—a period in which machines became the "new Messiah" and science the new "religion" promising a utopian mechanized paradise.[2]

The nineteenth and twentieth centuries were the cradle of a new religion. Paul Strand, an American modernist photographer and filmmaker, referred to these secular-religious tendencies of modern times by ironically equating the

1 For more information on the establishment of the school and the laboratory, see Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 592–614.

2 Henry Ford, "Machinery, the New Messiah," *Forum* (March 1928): 359–64. See also Philipp Blom, *Alleen de wolken: Cultuur en crisis in het Westen, 1918–1938*, trans. Pon Ruiter and Henny Corver (Amsterdam: De Bezige Bij, 2014), 235–41, for a discussion of the famous Soviet Taylorist Aleksei Gastev, founder and director of the Central Institute of Labor in Moscow in the 1920s.

FIGURE 5.3 Psychophysiological laboratory at the Institut Emile Metz: On the left, a young man is training on an ergometric bicycle. In the background, on the right, one can see three cylindrical recorders and the mercury manometer. Digital positive from glass plate negative.

"machine" with "God," "materialistic empiricism" with the role of Jesus the "son," and "science" with the "holy ghost."[3] Moreover, technological and scientific developments gave birth to the transhuman, posthuman, or what has been called cyborgs.[4] In *The Vertigo Years*, a book on the massive societal transformations at the beginning of the twentieth century, Phillip Blom writes: "Man and machine entered into a strange marriage, a fused, bionic body, a second creation."[5]

3 Paul Strand, "Photography and the New God," *Broom* 3, no. 4 (1922): 252.

4 In her famous 1985 article, Donna J. Haraway described a cyborg (cybernetic organism) as a "fusion of the organic and the technical forged in particular, historical, cultural practices." See Donna J. Haraway, "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s," *Socialist Review* 80 (1985): 65–107. See also Donna J. Haraway, "Modest_Witness @ Second_Millenium," in *The Social Shaping of Technology*, 2nd ed., ed. Donald MacKenzie and Judy Wajcman (Buckingham: Open University Press, 1999), 41–49.

5 Philipp Blom, *The Vertigo Years: Change and Culture in the West, 1900–1914* (London: Phoenix, 2009), 401.

Indeed, industrialization, mechanization, and techno-scientific evolutions gradually came to intertwine the organic with the artificial/machinic and thus revolutionized the established Western ideals of the organic order.[6] It was believed (at least by the post-humanists) that the dyad of technology and science would make it possible to create a new, reconfigured, and enhanced mankind. These promises aimed to mitigate the harsh critique of science which had emerged simultaneously at the turn of the twentieth century. Indeed, scientification was not yet generally recognized as a secular replacement for the omnipresent eye of God. However, as a result of the gradual secularization and loss of power of the church following the Reformation, scientific, empirical thinking found space for expression.[7] One major step in fulfilling the promise of scientific research was to gain eternally valid knowledge by replacing the subjective, naked human eye of the scientist with "the eye of the machine."[8]

It was a frantic time in which "scientific observers continually honed the techniques and technologies they employed to observe the external and internal world, at some times discarding the old as they developed the new and at other times simply redefining in what observation consisted."[9] The empirical examination of the human body and mind—not least by the post-1848 generation of physiologists and (experimental) psychologists—required tools of mechanical objectivity, such as cameras, collimators, chronometers, and calipers.[10] Technological developments—such as motion photography or chrono-photography, cinematography, and dynamography[11]—enabled mechanical registration, which would usher in modernist objectivity.[12] The new machine-mediated observation gradually came to supplement or even replace

6 See Katherine N. Hayles, *How We Became Posthuman* (Chicago: University of Chicago Press, 1999); Chris Hables Gray, *Cyborg Citizen: Politics in the Posthuman Age* (New York: Routledge, 2002).

7 Strand, "Photography and the New God," 252.

8 Ibid.

9 Lorraine Daston and Elizabeth Lunbeck, "Observing in New Ways: Techniques," in *Histories of Scientific Observation*, ed. Lorraine Daston and Elizabeth Lunbeck (Chicago: University of Chicago Press, 2011), 181.

10 See Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), 258. See also Vincent Borella, "Les corps entre mécanique et machines," in *Corps et machines à l'âge industriel*, ed. Laurence Guignard, Pascal Raggi, and Etienne Thévenin (Rennes: Presses Universitaires de Rennes, 2011), 255–56.

11 One of the pioneers of visual studies of human and animal locomotion was the English photographer Eadweard Muybridge (1830–1904). For more information on Muybridge, see Hans Christian Adam, ed., *Eadweard Muybridge: The Human and Animal Locomotion Photographs* (Cologne: Taschen, 2014).

12 See Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton, NJ: Princeton University Press, 1995).

the embodied experiences of the observer. Indeed, before the age of the observing machines, observation was still based on the capacity and function of the human eye and the ability to feel empathy with the observed subject. In his article "Seeing the Blush: Feeling Emotions," Otniel E. Dror argues that "the observer's capacity to visceral-embodied mirroring of the observed was transplanted to the machine."[13] He then goes on to describe this radical shift:

> [Machine-mediated] observation worked by transplanting the visceral activations of the observed subject not into the body of the observer, but into an exteriorized entity—the machine. The machine literally projected the visceral activations of the observed subject outside of the body in terms of graphic tracings or numeric tables. Instead of observing through self-embodied experiences, observers looked at the embodied visceral physiology of experience through the mediation of machines and in terms of graphs and numbers. The mechanical effects … of the beating of the heart literally pushed and moved the sensitive mechanical registering apparatus, which transcribed these visceral movements into graphs.[14]

A strong urge for "visual realism," which led to the development of all kinds of graphic methods of display, was a logical response to the growing impulse to record, visualize, and quantify as much data as possible in fields ranging from science, population studies, and health to economics and industry to crime.[15] Statistical material and graphic representations "were valued for their capacity to summarize large amounts of extensive and abstract information in a striking "image'" and were said to be "transparent forms of representation that offered the viewer unmediated access" to the observed subject.[16] The late nineteenth and early twentieth centuries were a period when "observing machines" became the new "lens" through which to inspect reality. Machine-produced graphs that replaced the sensory vision of experts, as well as statistics that replaced the knowledge-based expertise of individual researchers, were equated with objectivity and thus became the expert's main thinking pattern (brain) within the decision-making process.[17]

13 Otniel E. Dror, "Seeing the Blush: Feeling Emotions," in Daston and Lunbeck, *Histories of Scientific Observation*, 336.

14 Ibid., 337.

15 Anders Ekström, "'Showing at One View': Ferdinand Boberg's 'Statistical Machinery' and the Visionary Pedagogy of Early Twentieth-Century Statistical Display," *Early Popular Visual Culture* 6, no. 1 (2008): 46; Miles A. Kimball and Charles Kostelnick, eds., *Visible Numbers: Essays on the History of Statistical Graphics* (Farnham, UK: Ashgate, 2016).

16 Ekström, "'Showing at One View,'" 46.

17 Of course, the rise of statistical theory, statistical thinking, and statistical graphics have their roots in a more distant past. Michael Friendly has called the second half of

These new and abstract geometrical ways of seeing and (re)presenting were designed to serve scientific purposes and also played a major role in teaching and training.[18] They emerged within and/or were almost immediately adopted by the then nascent sciences, such as experimental psychology and labor science, as well as associated (sub)disciplines including psychophysiology, psychometrics, pedology, and fatigue studies.[19] Both scientists and artists shared a desire to capture human movements through abstraction, serial geometric (de)construction, lines, cubes, graphs, polygones, and numbers to represent the living and moving human body and its energy. Indeed, there was a tendency to experiment with the "translation" of "realistic" or naturalistic body movements into abstract, serial graphs as a way to discover basic patterns that could be generalized and essentialized. What was once familiar was translated into unfamiliar and abstract images that invited new ways of observing. Marcel Duchamp's 1912 painting *Nude Descending a Staircase, No. 2*, for example, was inspired by the chronophotographs of Etienne-Jules Marey and Eadweard Muybridge who both experimented with photographic image series to explore the basic principles of human movement and energy. Other artists like Sonia and Robert Delaunay explored the rhythm and energy of movements through vibrant and colorful abstract forms that were inspired by the frantic pace of modern life.[20] As such, scientific experiments were part of a larger social and cultural context, and scientists and artists were united in a common endeavor

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the nineteenth century the "golden age of statistical graphics" and the period we are dealing with "the modern dark ages of data visualization," as the initial enthusiasm for these graphics diminished during the first half of the twentieth century; see Michael Friendly, "The Golden Age of Statistical Graphics," *Statistical Science* 28, no. 4 (2008): 502–35. See also Frederik Herman, Karin Priem, and Geert Thyssen, "Body_Machine? Encounters of the Human and the Mechanical in Education, Industry and Science," *History of Education* 46, no. 1 (2017): 108–27; Kurt Danziger, *Constructing the Subject: Historical Origins of Psychological Research* (Cambridge: Cambridge University Press, 2002); Porter, *Trust in Numbers*; Gérard Jorland, Annick Opinel, and George Weisz, eds., *Body Counts: Medical Quantification in Historical and Sociological Perspectives/Perspectives historiques et sociologiques sur la quantification médicale* (Montreal: McGill-Queen's University Press, 2005).

18 See Ekström, "Showing at One View"; and, in this volume, Karin Priem and Frederik Herman, "'Sensuous Geographies' in the 'Age of Steel': Educating Future Workers' Bodies in Time and Space (1900–1940)."

19 For an excellent reference work on the early years of experimental psychology/pedagogy and pedotechnics, see Marc Depaepe, *Zum Wohl des Kindes? Pädologie, pädagogische Psychologie und experimentelle Pädagogik in Europa und den USA, 1890–1940* (Leuven: Leuven University Press; Weinheim: Deutscher Studien Verlag, 1993).

20 See Tate Modern Exhibition & Events, "The Ey Exhibition: Sonia Delaunay, 15 April–9 August 2015," http://www.tate.org.uk/whats-on/tate-modern/exhibition/sonia-delaunay.

to express, understand, and put on display forces or phenomena that were invisible to the human eye.[21]

2 Reading and Charting Apprentices' Bodies at the Institut Emile Metz

This chapter explores a specific case in the context of professional orientation, vocational training, and rehabilitation—the early twentieth-century techno-scientific experiments of the French labor physiologist, industrial ergonomist, and fatigue expert Jules (Mardochée) Amar (1879–1935), who saw his mission in life as uncovering and establishing the scientific foundations of human labor.[22] Observing machines—designed "to read the body"—as well as graphic and numerical representations were key to this mission and would, moreover, guarantee the desired mechanical and structural objectivity.[23] Amar advocated a moderate Taylorism and the humanization of labor at a time when the rationalization of labor had made its turbulent entry into Europe and led to fierce workers' strikes. In Amar's eyes, science (experimental psychology and, more specifically, psychophysiology and psychotechnology) would provide the solution and result in harmony and productivity by helping to eliminate, among other things, industrial fatigue or overfatigue (*surmenage*).[24]

21 Charles Kostelnick, "Melting-Pot Ideology, Modernist Aesthetics, and the Emergence of Graphical Conventions: The Statistical Atlases of the United States, 1874–1925," in *Defining Visual Rhetorics*, ed. Charles A. Hill and Marguerite Helmers (Mahway, NJ: Lawrence Erlbaum Associates, 2004), 215–42.

22 Jules Amar's work includes: *Le rendement de la machine humaine: Recherches sur le travail* (Paris: J.-B. Baillière, 1909); *Le moteur humain et les bases scientifiques du travail professionnel* (Paris: Dunod et Pinat, 1913/14); "La rééducation des blessés et mutilés de la guerre," *Revue scientifique* 54 (1916): 363–67; "Physical and Psychological Tests—Organization of the Training of the Disabled," *T. M. Canada—Special Bulletin* (1916): 29–42; *Le devoir agricole et les blessés de guerre* (Paris: Dunod et Pinat, 1917); *Organisation physiologique du travail* (Paris: Dunod et Pinat, 1917); "Titres et travaux scientifiques" (unpublished manuscript, Faculté de Médecine de Paris, 1919, BIU Santé, Paris); *The Human Motor, or The Scientific Foundations of Labour and Industry*, trans. Elsie P. Butterworth and George F. Wright (London: George Routledge & Sons; New York: E. P. Dutton & Co., 1920); Jules Amar and Paul Painlevé, *La prothèse et le travail de mutilés: Conférence faite pour les Oeuvres de Mutilés* (Paris: Dunod et Pinat, 1916).

23 Alexandre Klein, "'Lire le corps pour percer l'âme': outils et appareils à l'aube de la psychologie scientifique à Nancy," in Guignard, Raggi, and Thévenin, *Corps et machines à l'âge industriel*, 41–54. Unless otherwise noted, all translations are the authors' own.

24 See also François Vatin, "Les 'sciences du travail': une tentative de résolution positiviste de la question sociale," *Bulletin de psychologie* 61, no. 496 (2008): 331–40; François Vatin, "Du travail à la fatigue, genèse et échec de la psycho-physiologie du travail," *Bulletin de psychologie* 49, no. 425 (1996): 520–29; Nicolas Pitsos, "Le moteur humain en panne s'affiche:

We begin with a brief biographical sketch of the "forgotten" transhumanist Jules Amar.[25] This section also provides insight into Amar's views on society and mankind and his strong beliefs in the trainability and rehabilitation of man. It does so by exploring the transhumanist, rehabilitative discourses, practices, and devices (e.g., prosthetics) that he developed in the context of the First World War. The next two sections will deal with Amar's strong belief in observing machines—as "prosthetic" extensions of the observer's senses—as well as in the structural objectivity ostensibly brought about by the use of numbers, graphs, statistics, and differential equations. We will look at, among other things, Amar's mechanical observation and registration of apprentices' bodies by means of a dynamographic "Imbert-Amar" file, as well as the use of mechanically generated geometric and abstract charts and graphs in the context of the Institut Emile Metz.[26] Indeed, the institute's laboratory, established in 1919, used the innovative measuring and training apparatuses and methods developed—or at least inspired—by Amar for its program of professional orientation and vocational training. Throughout their school career, apprentices at the Institut Emile Metz were subjected to all kinds of measurements and tests that mapped their physical dimensions and their physical and psychological functions (see fig. 5.3).[27] In this context, the generated numbers, lines, and graphs became the tools par excellence for "making judgements, drawing

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le corps épuisé au tournant du XIXe siècle," in Guignard, Raggi, and Thévenin, *Corps et machines à l'âge industriel*, 289–300.

25 Indeed, despite his major contributions to the labor sciences in France, Amar ended up being overshadowed by his contemporaries such as the (psycho-)physiologists and industrial psychologists (Jules Adolphe) Georges Weiss (1859–1931), Jean-Marie Lahy (1872–1943), Henri (Louis) Le Châtelier (1850–1936), and Josefa Ioteyko (1866–1928). See Hugues Monod and Janine Monod, "Jules Amar (1879–1935)," *Histoire des sciences médicales* 13, no. 3 (1979): 231; Michel Valentin, *Travail des hommes et savants oubliés: Histoire de la médecine du travail, de la sécurité et de l'ergonomie* (Paris: Editions Docis, 1978). Amar's work has received more attention since its rediscovery by Prof. Dr. Hugues Monod, Prof. Dr. Christine Théré, and Prof. Dr. François Vatin from the Université de Paris Ouest, who are preparing an anthology on the labor sciences in France from Guillaume Amontons (1663–1705) until Jules Amar. Incidentally, the book cover of *Le moteur humain* and a (graffiti) portrait of Jules Amar are currently decorating the entrance to the infirmary of the Paris Conservatoire national des arts et metiers (CNAM).

26 Herman, "Forging Harmony in the Social Organism." See also Françoise Poos, "Photography as a Space for Constructing Subjectivities: Luxembourg's Steel Dynasties and the Modern Workforce as Seen through the Glass Plate Negatives from the Institut Emile Metz" (in this volume).

27 See Herman, "Forging Harmony in the Social Organism"; Herman, Priem, and Thyssen, "Body_Machine?," 108–27; Frederik Herman, Karin Priem, and Geert Thyssen, "Körper_Maschinen? Die Verschmelzung von Mensch und Technik in Pädagogik, Industrie und Wissenschaft," *Jahrbuch für Historische Bildungsforschung* 20 (2015): 47–75.

conclusions, proposing rectification"—practices that would significantly determine the future of these apprentices.[28]

3 The Transhumanist Jules Mardochée Amar (1879–1935)

Amar was born in a modest home in Tunis on November 14, 1879.[29] After graduating in literature and philosophy, he went to Paris in 1898, where he completed numerous courses in botany, biochemistry, general chemistry, general physiology, and mineralogy at the Sorbonne.[30] In 1905, Amar became an assistant at the Medical Physics Laboratory of the Medical Faculty in Paris under the supervision of the physiologist Georges Weiss.[31] Shortly afterwards, he was appointed director of the laboratory, a position he would hold until 1913. In 1907, he agreed to undertake a scientific mission for the Ministry of Public Instruction and, in the same year, was tasked with another long-term mission by the Ministries of Public Instruction and of Labor to examine the working capacities of prison inmates at Biskra, Algeria. More specifically, he was to determine the optimal efficiency of the "human motor" in relation to food consumption and digestion.[32] During the same period, he completed his doctoral thesis, published under the title *Le rendement de la machine humaine* (The yield of the human machine, 1909), in which he elaborated on physical and mental fatigue and the optimal but economical expenditure of human energy in the context of labor. Shortly afterwards, in 1911, Amar was appointed a member of the Commission on the Physiology of Labor at the Ministry of Labor,[33] which was established in response to the introduction of Taylorism in France around 1910 and was tasked with scrutinizing the harmful effects of

28 Thomas S. Popkewitz, "The Empirical and Political 'Fact' of Theory in the Social and Education Sciences," in *Making a Difference in Theory: The Theory Question in Education and the Education Question in Theory*, ed. Gert Biesta, Julie Allan, and Richard Edwards (London: Routledge, 2014), 13–29.

29 Monod and Monod, "Jules Amar (1879–1935)," 227.

30 Amar, "Titres et travaux scientifiques," 1–2.

31 Ibid. For more biographical details, see also Valentin, *Travail des hommes et savants oubliés,* 291–96; Monod and Monod, "Jules Amar (1879–1935)"; Georges Ribeill, "Les débuts de l'ergonomie en France à la veille de la Première Guerre mondiale," *Le mouvement social* 113 (1980): 14–16; Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (Berkeley: University of California Press, 1992); Hugues Monod, "Amar, Jules (1879–1935)," in *Les professeurs du Conservatoire National des Arts et Métiers: Dictionnaire biographique 1794–1955,* vol. 1, ed. Claudine Fontanon and André Grelon (Paris: INRP/CNAM, 1994), 97–107.

32 Rabinbach, *The Human Motor*, 158, 185.

33 Amar, "Titres et travaux scientifiques," 1–2.

industrialization on the workers.[34] In 1913, a temporary Research Laboratory on Muscular Activity in the Context of Labor was founded at the National Conservatory of Arts and Crafts for the same purpose. The same year, Amar was appointed director of this psychophysiological laboratory.[35]

In 1913/14, he published his key work, *Le moteur humain et les bases scientifiques du travail professionnel* (*The Human Motor, or The Scientific Foundations of Labour and Industry*), in which he linked the human organism in the context of labor to the laws of general mechanics and modern physiology and elaborated on, among other things, the "architecture" of the human body, the muscular motor, nutrition and energy expenditure, the productivity of the human machine, the physiological effects of work (notably fatigue), balance and movements of the human body at work, and man and the environment.[36] His work soon became the basis for human engineering in Europe and the United States.[37] Amar clearly strove for "social efficiency" or a "moderate Taylorism."[38] He was not so much interested in industry's blunt quest for maximum productivity, which would inevitably result in exhausted and demoralized workers, but rather in adapting the working conditions to the workers' physical aptitudes and in rigorously training their bodies so that they would achieve physical and mental balance and harmony and thus function optimally and tirelessly. Amar's main concern was achieving the most economical use of energy and, thus, the maximum amount of work with the minimum amount of energy expenditure.[39] Accurate and objective experimental physiological measurements and data would allow the scientific adjustment of human bodies to the workplace, providing insights into the level of fatigue and energy consumption and making it possible to identify a predetermined optimum.

34 Monod and Monod, "Jules Amar (1879–1935)," 230.

35 Ibid.; see also Régis Ouvrier-Bonnaz, "L'histoire des chaires du CNAM concernant l'Homme au travail (1900–1945) entre production de savoirs et engagement politique," *Cahiers d'histoire: Revue d'histoire critique* 111 (2010): 99–121. For the sake of completeness, it should be mentioned that Amar was also a member of the Orthopaedic Commission of the Ministry of War, of the National Office of Mutilated Persons, and of the Committee for the Improvement of the Training of the Maimed at the Ministry of Labor.

36 Herman, Priem, and Thyssen, "Körper_Maschinen?," 49.

37 Reinhard Klette and Garry Tee, "Understanding Human Motion: A Historic Review," in *Human Motion: Understanding, Modelling, Capture and Animation*, ed. Bodo Rosenhahn, Reinhard Klette, and Dimitris Metaxas (Dordrecht: Springer, 2008), 13.

38 Rabinbach, *The Human Motor*, 128; Herman, "Forging Harmony in the Social Organism," 610.

39 Rabinbach, *The Human Motor*, 188; Raf De Bont, "Energie op de weegschaal: Vermoeidheidsstudie, psychotechniek en biometrie in België (1900–1945)," *Belgisch Tijdschrift voor Nieuwste Geschiedenis/Revue Belge d'Histoire Contemporaine* 32, nos. 1–2 (2002): 23–71.

Excessive energy consumption was attributed to factors such as wrong body posture or inappropriate movements, incorrect manipulation of tools, maladjusted speed or pressure. An optimal functioning could be achieved by synchronizing the workers' performance with a science-based norm or "prototype" and by complying with detailed instructions formulated by Amar on the basis of a series of trial experiments.

The "human motor" metaphor used by Amar to link bodies and machines on the eve of the First World War foreshadowed the literal connections he would make between the mutilated soldiers and the mechanical prosthetics during and after the war.[40] Indeed, the First World War caused Amar to (re-)orient his focus towards rehabilitative practices and to apply his scientific expertise in the entangled fields of experimental psychology, psychophysiology, biomechanics, and fatigue studies to the design of prostheses, the restoration of mutilated bodies through mechanical limbs, and the vocational orientation and training of the maimed heroes.[41] It became Amar's pioneering mission to render the muscular male bodies of the "glorious victims" again capable of performing useful work in different sectors.[42] In Amar's opinion, all

40 See Herman, Priem, and Thyssen, "Körper_Maschinen?"; Jacques Gleyse et al., "Physical Education as a Subject in France (School Curriculum, Policies and Discourse): The Body and the Metaphors of the Engine—Elements Used in the Analysis of a Power and Control System during the Second Industrial Revolution," *Sport, Education and Society* 7, no. 1 (2002): 5–23; Katja Patzel-Mattern, "Menschliche Maschinen – Maschinelle Menschen? Die industrielle Gestaltung des Mensch-Maschine-Verhältnisses am Beispiel der Psychotechnik und der Arbeit Georg Schlesingers mit Kriegsversehrten," *Würzburger medizinhistorische Mitteilungen* 24 (2005): 378–90.

41 See Amar and Painlevé, *La prothèse et le travail de mutilés,* 2; "The Training of Maimed Soldiers," *The Engineer*, June 9, 1916, 472–73. Amar's ideas on rehabilitation would prove influential for the actual practices of rehabilitation during and after the war. His methods were applied, for instance, at the Military Professional School for Mutilated Belgians in Port-Villez (France), at the Centers of Manual Labor and Workshops in Rouen (France), which was affiliated with the Anglo-Belgian Hospital Roi Albert I set up to accommodate wounded allies, and at other *écoles de rééducation professionnelle* in France and Italy. See Amar, "La rééducation des blessés et mutilés de la guerre," 367; Amar, "Physical and Psychological Tests," 32. For more information on these rehabilitative practices and the experiences of maimed soldiers in these institutes, see Pieter Verstraete and Frederik Herman, "A Plea for Commonality: Disability History, Discourses of Rehabilitation, and the Individual," *Asclepio: Revista de Historia de la Medicina y de la Ciencia* 68, no. 2 (2016): n.p.

42 Compared to its neighboring countries, France lagged behind, as it lacked a network of specialized institutes (for example, *ateliers-écoles pour les estropiés*) as well as systematized and comprehensive programs for the physical rehabilitation of veterans. See J. McLennan, "Introduction," *T. M. Canada—Special Bulletin* (1916): 5; Émile Galtier-Boissière, *Larousse médical illustré de guerre* (Paris: Librairie Larousse, 1917), 2; see also

bodies—young and old, abled and disabled, male and female—could be improved as "principal sites of a man's productive value."[43] All bodies were malleable and mendable and thus could become subjects of objective observation and training with regard to (re-)employment. Human bodies and the rhythm of the machine imposed by society's and industry's quest for maximum productivity had to be harmonized and optimized.[44] Indeed, as Verstraete and Herman have suggested, "all members of the community were thought of as being defective or even 'crippled' and had to be turned into a science-based prototype of the inexhaustible and efficient worker along the same trajectory of authoritative psychophysiological and medical testing and training." Neither Amar's general focus on harmonizing industrial production nor the methods he applied distinguished between able and maimed bodies, as he saw the maimed soldiers as part of a "crippled" society that, suffering from a loss of energy and a lack of knowledge on the mechanics of the human body, needed to be made efficient (again). This is shown by the fact that he used the same or similar measuring and training devices and aptitude cards, whether testing prison inmates, maimed soldiers, or apprentices of a vocational school. Rather than focusing on the distinction between the psychologically and/or physically disabled and abled, his rehabilitative discourse centered on the learning capabilities, trainability, and level of skillfulness of all members of the workforce.

Rabinbach, *The Human Motor*; Gordon Hughes and Philipp Blom, *Nothing but the Clouds Unchanged: Artists in World War I* (Los Angeles: The Getty Research Institute, 2014). Amar's experimental approach, the devices (e.g., the *cheirograph*, the *dynamographic bulb, ergometric cycle* and *arthrodynameter*) and prostheses (e.g., working arm) he developed, and the ideas he elaborated on vocational orientation and retraining processes in his capacity as director of the newly created Laboratory for Military Prosthesis and Occupational Labor (1915) had international reverberations. See, for instance, W. M. Dobell, "Report on European Work," *T. M. Canada—Special Bulletin* (1916): 11–28; McLennan, "Introduction"; "The Training of Maimed Soldiers"; Leo de Paeuw, *Vocational Reeducation of Maimed Soldiers* (Princeton, NJ: Princeton University Press, 1918), 144; Monod, "Amar, Jules"; Roxanne Panchasi, "Reconstructions: Prosthetics and the Rehabilitation of the Male Body in World War I France," *Differences: A Journal of Feminist Cultural Studies* 3, no. 3 (1995): 109–40; Elspeth H. Brown, "The Prosthetics of Management: Motion Study, Photography, and the Industrialized Body in World War I America," in *Artificial Parts, Practical Lives: Modern Histories of Prosthetics*, ed. Katherine Ott, David Serlin, and Stephen Mihm (New York: New York University Press, 2002), 249–81; Clément Collard, "Que faire des 'héros vaincus'?—La rééducation professionnelle des mutilés de la Grande Guerre 1914–1940" (master's thesis, Institut d'études politiques de Paris, 2014).

43 Roxanne Panchasi, *Future Tense: The Culture of Anticipation in France between the Wars* (Ithaca, NY: Cornell University Press, 2009), 23.

44 Priem and Herman, "'Sensuous Geographies' in the 'Age of Steel.'"

During and after the First World War, Amar took his strong belief in the learning capabilities and trainability of man, which was rooted in his pre-war research, to another level. Amar believed that the majority of the maimed soldiers could be rehabilitated and again become full and "complete" members of society (*hommes complets*) after undergoing thorough psychophysiological training.[45] His training program, which, in his view, had to be offered as soon as the wounds were healed, consisted of three main stages. Throughout the rehabilitation process, the physical, psychological, and intellectual capacities were carefully observed, recorded, and trained.[46] During the first phase of "functional restoration," Amar aimed to combat muscle and joint stiffness and muscle atrophy and to render the tendons and cartilage tissue flexible again through a systematic and cumulative physiological training program using exercise machines. His "intelligent mechanical therapy" was based on scientific motion studies conducted with the aid of recording tools and/or self-recording training devices.[47] Symbolizing faith in unceasing scientific progress, these tools and devices enhanced reliability and objectivity and made it possible to record the recovery process.[48] Not only the mutilated limb but the entire body—the sensory organs, heart, lungs, and central nervous system—were subjected to a thorough medico-physiological screening to optimize their capacity for work. Determining the organic defects and the remaining physical abilities and improving the condition of the entire body were essential in the fight against fatigue. Special emphasis was put on the training of the mutilated limb, or the "sensitive training of the stump."[49] Performing progressive movement exercises with the help of training and measuring devices could correct these deficiencies. In this phase, mental, sensory and behavioral "re-programming" were key. During the second phase, the so-called prosthetic phase, the maimed received their mechanical limb(s).[50] Functionality of the prosthesis always took precedence over aesthetics, as the lost function and thus productive value had to be restored by means of a practical prosthesis, which was customized with

45 Amar and Painlevé, *La prothèse et le travail de mutilés*, 2.

46 Amar, "Physical and Psychological Tests," 31.

47 Amar and Painlevé, *La prothèse et le travail de mutilés*, 7.

48 Ibid., 9.

49 Galtier-Boissière, *Larousse médical illustré de guerre*, 4–6, 36.

50 Amar designed and patented a lot of artificial limbs, such as the 'articulated hand' and the 'working arm'; see Monod and Monod, "Jules Amar," 22; Gilles Colas des Francs, *L'oeuvre de Jules Amar entre 1914–1918* (Paris: Reprocopy, 1984). It was this 'working arm,' a prosthesis to which a series of basic tools and a natural-looking parade hand (*main de parade*) could be attached, that made Amar famous on both sides of the Atlantic; see Panchasi, *Future Tense*, 19–20.

the goal of using human energy and the existing factory equipment as efficiently as possible.[51] The last phase of the occupational rehabilitation began once the owner had sufficiently familiarized himself with his new mechanical limb. This stage consisted of three modules: theoretical training, handicrafts, and in-service training. Both theoretical and general education had to awaken the disabled soldier's latent intelligence and raise his intellectual level, which would in turn enhance body coordination. Courses dealt with topics such as the selection of proper tools for specific tasks and the operation of machines.[52]

4 The Scientific Observer as a "Prosthetic God"[53]

"Under experimental conditions, with mathematical and scientific rigor, Amar studied the mechanics of the human body in microscopic detail," both in the laboratory and on the factory floor.[54] Indeed, he strongly believed that achieving the maximum and optimal use of the nation's resources would require rational and scientific methods and devices.[55] Key to Amar's approach was the permanent gathering of physiological data during the rehabilitation and training processes by means of a variety of advanced observation, measuring, and training apparatuses, many of which he invented himself while also refining existing devices.[56] He extensively described these specialized and advanced ergographic and dynamographic apparatuses in various publications.[57] In the

51 Brown, "The Prosthetics of Management," 335; Panchasi, "Reconstructions."

52 See Amar and Painlevé, *La prothèse et le travail de mutilés*, 15.

53 Sigmund Freud, *Civilization and Its Discontents*, trans. David McLintock (London: Penguin Books, 2004), 39.

54 Rabinbach, *The Human Motor*, 187. For a brief overview of the history of the experimental method, its devices, and its key figures, such as the founding father of positivism, the French philosopher Auguste Comte (1798–1857), and the French physiologist Claude Bernard (1813–1878), see Klein, "Lire le corps pour percer l'âme," 52–53.

55 Amar and Painlevé, *La prothèse et le travail de mutilés*, 4.

56 See also Rabinbach, *The Human Motor*, 185. Interestingly enough, despite the fact that efficient, rhythmical, and precise body movements were key to Amar's approach (see Priem and Herman, "'Sensuous Geographies' in the 'Age of Steel'"), he did not apply already existing photographic or cinematographic methods such as chronophotography and chrono-cyclography. In his *Le moteur humain*, he devoted only a short section to these techniques, stating that these approaches—which had indeed "resolved in a most striking and beautiful way the problems of kinetics"—were only appropriate for 'movement studies'; see Amar, *Le moteur humain*, 14–16.

57 The following descriptions of the devices are mainly based on Jules Amar, *The Physiology of Industrial Organisation and the Re-Employment of the Disabled*, ed. A. F. Stanley Kent, trans. Bernard Miall (London: The Library Press Limited, 1918), 147–59.

following, we will take a closer look at three examples: the cheirograph, the dynamographic bulb (*poire dynamographique*), and the ergometric cycle (*cycle ergométrique*).[58]

Amar's cheirograph—a modification of the Italian physiologist Angelo Mosso's digital ergograph—was designed to measure the variety of hand movements, from the wrist to the fingers, and the muscle power used during these movements (see fig. 5.4).[59] The test consisted of repetitively pulling, by means of a cord, a weight which was attached to a specific part of the hand (e.g., finger or wrist), while the hand and forearm were partly immobilized by a kind of brace. Each flexion generated a curve. The final graph expressed the number of contractions, the rhythm, and the degrees of displacement of the weight. The rhythm as well as the intensity of the contractions (the swing of the curve) gradually decreased as a result of the test subject's fatigue. This negative effect could be postponed through progressive training. Indeed, Amar wrote, "thanks to this apparatus, the hand, that delicate segment of the upper limb, so well adapted to movements involving skill and celerity, may be subjected to a functional education, for whose results … we have not very long to wait."[60]

Amar also transformed all kinds of ordinary utensils into scientific observation and training devices by connecting them to a dynamograph, turning them into dynamographic tools—such as, for example, the dynamographic hammer, slicer, file, typewriter, pencil, bulb, and sidewalk (see fig. 5.5)—which

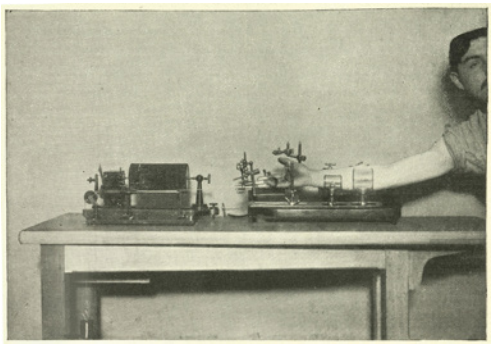

FIGURE 5.4
Arrangement of Amar's cheirograph test. Reprinted from Galtier-Boissière, *Larousse médical illustré de guerre* (1917), 63.

58 For a description of other devices and tests such as, for example, the perforating test, the coordination test with a two-hand coordinator, and the hammering and filing test, see Priem and Herman, "'Sensuous Geographies' in the 'Age of Steel.'"

59 For more information, see Amar, *Le moteur humain*, 391; Amar, *The Physiology of Industrial Organisation,* 151–54; Galtier-Boissière, *Larousse médical illustré de guerre*, 62–64.

60 Amar, *The Physiology of Industrial Organisation,* 151.

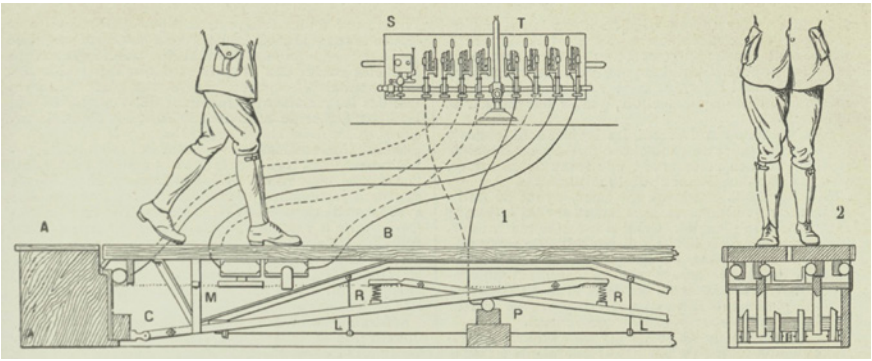

FIGURE 5.5 Illustration of Amar's dynamographic sidewalk.

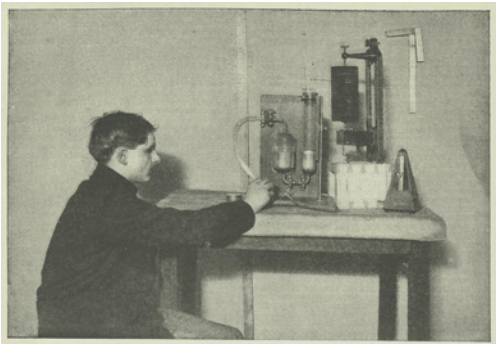

FIGURE 5.6
Arrangement of Amar's dynamographic bulb exercise. Reprinted from Galtier-Boissière, *Larousse médical illustré de guerre* (1917), 319 and 244.

recorded the rhythm of the movements and the force used during the performance while also generating dynamographic graphs.[61] Everyday objects and materials as sites of everyday experience thus continued to be at the heart of experimentation settings. A typical example is the "synergetic training" of the hand with the aid of a dynamographic bulb or bulb dynamometer (see fig. 5.6). The test subject was asked to repeatedly squeeze a rubber bulb connected to a mercury manometer and a cylindrical recorder (*cylindre enregistreur*), which plotted a graph providing information on the rhythm, the pressure exercised with the fingers, the persistence of the pinch, and the level of fatigue.[62] Amar

61 The dynamographic sidewalk (*trottoir dynamographique*) plotted the movement of and the pressure exercised by the legs in motion. For an illustration and more technical details, see Galtier-Boissière, *Larousse médical illustré de guerre*, 319–20.

62 "This [device] consists of a strongly-made pear-shaped bulb of Indiana-rubber having a capacity of 125 cubic centimeters. This is filled with air at any desired pressure by means of a cycle pump. It is connected with a mercury manometer, one of whose arms is capacious enough to contain at least 500 cubic centimeters of mercury, while the other

also designed an ergometric cycle (today called a friction-cycle ergometer; see figs. 5.2 and 5.5) to study the human metabolism, the expenditure of energy, and the degree of fatigue.[63] The bicycle was the perfect apparatus to record the amount of work performed by the muscles of the legs, but it could also be used (after some transformations) to test and train the arms or even mutilated limbs.[64] Moreover, Amar also used it to collect other medical and physiological data—with the aid of additional devices, such as, for example, a cardiograph, respirator, or spirometer.[65]

Since Amar did not believe that the observer's eye and/or empathy were perfect, he extended the observer's senses and embodied experience through machine-mediated observation, employing a fleet of observation apparatuses.[66] Scientific research thus was no longer possible without a laboratory and relevant apparatuses.[67] The promise these (ergographic) tools held out to the scientist was described by Amar in *The Human Motor* as follows:

> Errors are reduced both by the accuracy of the instruments employed, and their frequent calibrations, and also by arranging that, where possible, they shall be self-recording. The demands on the attention of the observer are thereby greatly reduced and the possibility of visual errors in observation eliminated.[68]

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branch, which is longer, contains about 30 cubic centimeters. This latter contains a registering float, so that all displacements of the mercury caused by the pressure of the finger, above the known pressure of the air in the bulb, are recorded on a registering cylinder …. The oscillations of the mercury are damped by a constriction in the tube connecting the two arms. The difference of level in the two arms measures the total pressure. … The compression of the fingers causes a variation of the initial pressure, and the variations furnish a tracing which is graduated once and for all. … [This device makes] it possible to follow the advance of functional fatigue as the hand continues its exertions and also the rhythm of movements." Amar, *The Physiology of Industrial Organisation*, 154–56. For more technical details, see also Galtier-Boissière, *Larousse médical illustré de guerre*, 244–45.

63 For a historical overview of this device, generally used in medical and physiological testing and/or (aerobic) training, and the different kinds of ergometers, see Henry Vandewalle and Tarak Driss, "Friction-Loaded Cycle Ergometers: Past, Present and Future," *Cogent Engineering* 2 (2015): 1–35.

64 See also Herman, Priem, and Thyssen, "Body_Machine?"; Verstraete and Herman, "A Plea for Commonality."

65 A typical example is the apprentice wearing a gas mask while performing the cycle test, as shown in fig. 3.

66 See Dror, "Seeing the Blush: Feeling Emotions," 336.

67 See Klein, "Lire le corps pour percer l'âme," 52.

68 Amar, *The Human Motor*, 262–63.

So it was not only the maimed who needed prostheses; the scientific observer, too, was in need of prosthetic devices which would allow him/her to "see" and more broadly "sense" through the machine what otherwise would remain invisible to the naked eye or "escape the observer's senses," to remember or to keep track of the subject's development, and, finally, to judge accurately and objectively.[69]

Indeed, Amar was striving for what one can call "mechanical objectivity."[70] He wanted to capture the energy flow in the human body at work and to register the inner workings of body and mind with as little human intervention as possible—that is, unmediated by language and untainted by subjective projections.[71] According to Amar, the researcher could trust the mechanical evidence of the self-recording measuring devices, which supplemented the direct, naked-eye observation of bodies in action (reality) and allowed *a posteriori* observation of the mediated reality (graphs). Thus Amar distinguished several, partly overlapping observation phases: (1) direct, naked-eye observation of the action by the researcher; (2) observation and registration of the ongoing action through the eye of the machine; (3) examination of the generated graphs while the test subject performs the test; and, finally, (4) *a posteriori* analysis and interpretation of the generated graphs.

5 Abstracting Bodies: Dots, Graphs, Numbers, and Differential Equations

Amar's apparatuses generated graphs—linear representations of rhythm, amount of force expended, etc.—over a certain period of time. These geometric and graphic forms made it possible to both analyze the evolution of the performance (over time) on the spot and later compare it with other registered performances (of the same subject or peers). It thus recorded, visualized, and "materialized" experiences that otherwise would have "evaporated." Moreover, these graphs visualized the smallest nuances that could not be seen with the naked eye. Indeed, they opened up a new dimension of observing and perceiving reality. It could be argued that this kind of mediated reality had an artifical character, as the phenomenon only took on the appearance of a phenomenon

69 Ibid., 265.

70 We have borrowed this concept from Daston and Galison, but use it in a slightly different way in the sense that we refer to the moment of registration rather than to the visual-material result (e.g., micro-photograph). See Daston and Galison, *Objectivity*, 18, 20.

71 Ibid., 20, 43.

and became "real" as a result of the mechanical registration and inscription devices.[72] The abstract representations of the body's movement—by means of dots, graphs, numbers, and differential equations—were simultaneously seen as evidence of an otherwise unnoticeable reality. Amar strove to make experiences and "data more visible to the eye and memorable to the mind."[73] Indeed, in his opinion, the quantitive data portrayed in graphs were "transparent" learning tools.[74] He writes:

> I had to create several accurate and uncomplicated apparatuses, which have proven to obtain good results. … This technique has the advantage that it is directly appealing to the eyes and reliable; it is based on graphic registration, which allows to evaluate the muscular strength and to see the evolution. It thus reveals, at any time, the progress made. …
>
> Great lessons can be derived from them for both training and work, and real practical suggestions for the worker who enjoys observing and seeking clarity. In his eyes, the model, graphically and impersonally taught, has a sovereign value; it outperforms written or verbal explanations.[75]

Like many other nineteenth- and early twentieth-century scholars from a wide array of disciplines such as statistics and mathematics, political economy, engineering, sociology, physical science, and medicine, Amar strove to quantify human labor and physical endeavor, and to use the "visual display of quantitative information"—or *visible numbers*, in Kostelnick and Kimball's phrase—to gain insight into human bodies at work.[76] Neutral numbers or dots on a graph, stripped of qualitative and subjective projections, became his main tool to engineer a science-based prototype of the ideal worker (*l'ouvrier modèle*), taking the Belgian statistician Adolph Quetelet's "average man" (*l'homme moyen*) to another level, from normality to ideality.[77] The measurable construct of the

72 Bruno Latour and Steve Woolgar in this context refer to Bachelard's notion of 'phenomenotechnique,' which implies that phenomena are often "thoroughly constituted by the material setting of the laboratory"; see Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts* (Princeton, NJ: Princeton University Press, 1986), 64.

73 Kostelnick and Kimball, "Introduction," in Kostelnick and Kimball, *Visible Numbers*, 1.

74 Amar, "Physical and Psychological Tests"; Amar, "Titres et travaux scientifiques," 11.

75 Amar and Painlevé, *La prothèse et le travail de mutilés*, 7, 15.

76 Edward R. Tufte, *The Visual Display of Quantitative Information* (Cheshire, CT: Graphics Press, 1983); Kimball and Kostelnick, *Visible Numbers*.

77 Researchers usually interpreted their data on the basis of an *a priori* model of universal equilibrium. In an encyclopaedia entry on the bell curve, Lynn Fendler writes that Adolphe Quetelet "assumed that social phenomena would show the same regularity as

"efficient" model worker—based on large-scale observations[78]—became the prevailing frame of reference for testing and training future workers.

Figure 5.7 shows a poster entitled "*Exercices rationnels d'entrainement au travail à la lime bâtarde*" (Rational training exercises to manipulate the bastard file). It displays the mechanically registered "ideal" results obtained by the instructor as well as the two test results of four locksmith apprentices (A, B, C, S) with five months of training, before and after a short but intensive training (13 one-hour lessons each, with 2 lessons a day). Conducted at the vocational school's psychophysiological laboratory and recorded by means of a dynamographic "Imbert-Amar" file, the tests recorded the backward gliding movement of the file (*poussée arrière*) as well as the total pressure exerted on the piece (*pression totale sur la pièce*). Two recording speeds were applied—the instant/synchronic registration (*tracé instantané*) and interval recording (*tracé sur enregistreur ralenti*)—which generated a finger-shaped and a blade-of-grass pattern, respectively. The model performance by the instructor is visible as a steady and balanced—or call it a rhythmic and harmonious—chart, whereas the more or less irregular curves of the apprentices hint at, among other things, hesitant movements, a poor manipulation of the file, and bad body postures, reflecting the apprentices' individual "character." The personal deficiencies and, with them, the differences between the apprentices' performances seem to have faded (at least partly) as a result of the training, which helped the apprentices approach what was considered the standard or norm. By juxtaposing the pre- and post-training results, the poster thus becomes a kind of hymn, expressing a strong belief in the trainability of man and glorifying applied-science approaches.

Amar also went beyond these "visible numbers" and, like many of his contemporaries who aspired to a kind of "structural objectivity," tried to organize his findings into more abstract and coherent structures—generalizable and predictive mathematical models, formulas, and differential equations—which made it possible to predict the "outcome" (if all the variables are known) or calculate the value of the missing variable. As Lorraine Daston and Peter Galison have pointed out, advocates of structural objectivity (often mathematicians,

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celestial bodies" and that he "began with a theoretical belief in the moral superiority of bell-curve distributions"; see Lynn Fendler, "Bell Curve," in *Encyclopaedia of Educational Theory*, vol. 1, ed. Dennis C. Phillips (New York: Sage, 2014), 83–86, http://fendler.wiki.educ.msu.edu/Bell+Curve. See also Kevin Donnelly, *Adolphe Quetelet, Social Physics and the Average Men of Science, 1796–1874* (Pittsburgh, PA: University of Pittsburgh Press, 2016).

78 In 1919, Amar wrote: "Statistics were one of our study methods; all our surveys, in various countries, cover more than 33,000 people, of both sexes, and—in terms of apprentices—nearly 700 children." See Amar, "Titres et travaux scientifiques," 11.

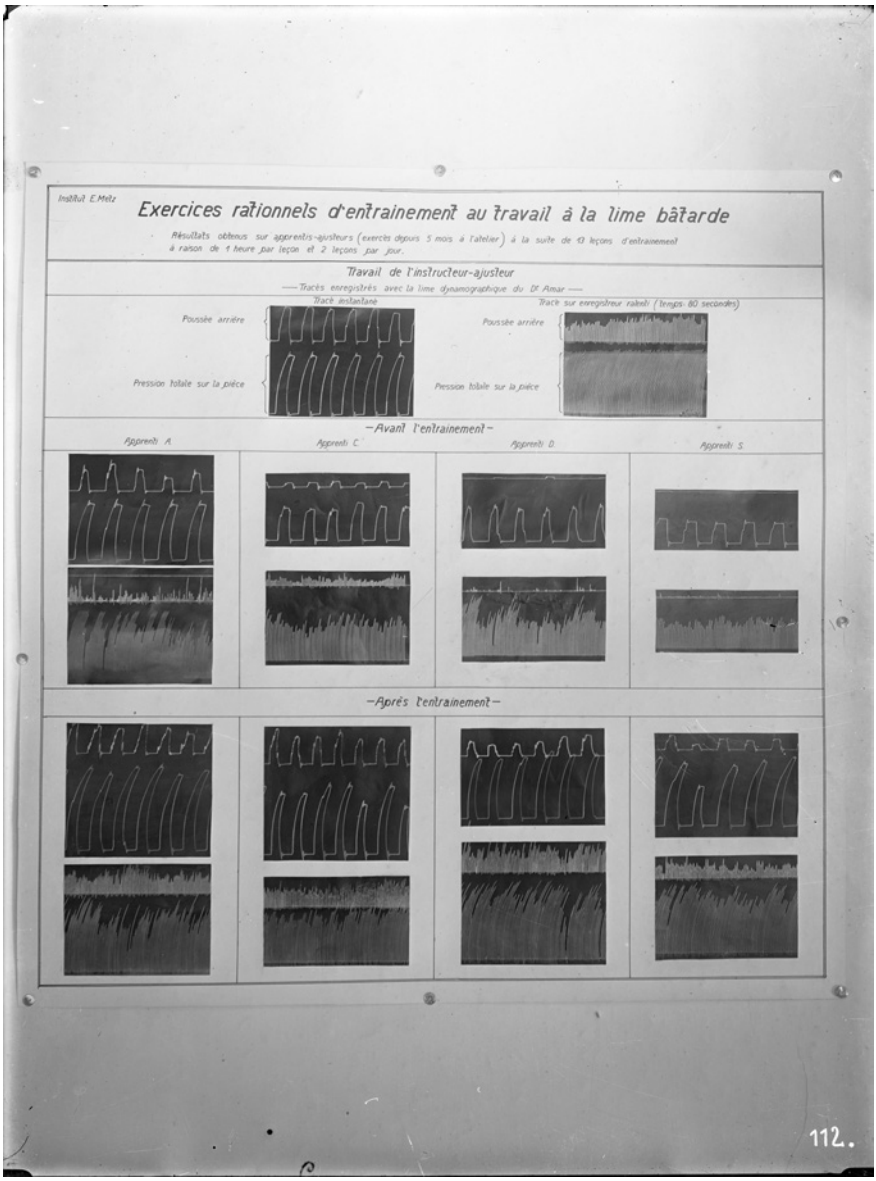

FIGURE 5.7 Poster displaying the filing test results of the instructor and four apprentices. Digital positive from glass plate negative.
© INSTITUT EMILE METZ. CNA COLLECTION.

physicists, and logicians) believed that taking refuge in these structures was the only way "to break out of the private mental world of individual subjectivity. In their view, science worthy of the name must be communicable to all, and only structures—not images, not intuitions, not mental representations of any kind—could be conveyed to all minds across time and space."[79] In other words, representatives of structural objectivity "identified the "structures" as the core of objectivity."[80] Amar did so as well, while he tried to capture "universal laws" by means of a neutral language and applied, refined, and combined existing and/or developed new equations.[81]

6 Conclusion

If Amar imagined the ideal worker or human being as a man-machine hybrid with adjustable, removable, and replaceable mechanical "auxiliary organs"—extensions which would open up new possibilities to achieve supra-natural perfection—then he imaged a similar future for scientific observers.[82] In order to overcome their limitations of body and mind, the researchers, like the maimed soldiers, had to be equipped with mechanical extensions of their body and senses. Hence, in order to map the workers' or apprentices' physical and psychological functions, the observers too should not be limited by their physical

79 Daston and Galison, *Objectivity*, 254.

80 Ibid.

81 *The Human Motor* contains many of these formulas, such as equations representing man's maximum daily output ($\mathbf{T} = F \times v \times t$) or the work done by the muscles of the leg ($R \times D = \mathbf{T} = 2F\ d$.) Amar explains the first equation, "The Maximum Work of Man," which he ascribed to the geometricians and natural philosophers Daniel Bernoulli and Euler Coulomb, as follows: "From the industrial point of view, the mechanical work estimated in kilogrammetres must be considered in most trades. … This work is evaluated by determining the power of the subject, the product of his effort, his speed in unit time, a second, and by multiplying this power ($F \times v$) by the effective duration of the labour in seconds, whence: $\mathbf{T} = F \times v \times t$. Particular values of these three factors can be found, so that the product $F \times v \times t$ is a maximum. **T** will then represent man's greatest daily output." See Amar, *The Human Motor*, 178. As for the work done by the legs, he writes: "If F is the uniform pressure on each pedal [of a dynamographic cycle] and d is the diameter of the circle of the pedal, the work done [**T**] will be $F \times d$. Per stroke of the pedal (both legs working) it is approximately: $\mathbf{T} = 2F\ d$. This is the work performed by the legs, and is also the work done in advancing the loaded bicycle. It is clear that, by each stroke of the pedal the bicycle advances a distance D, depending on the gear. If R is the sum of the resistances overcome (resistance to rolling, passice resistance of the bearings and of the transmission, and resistance of the air) then $R \times D = \mathbf{T} = 2F\ d$. So that, knowing T or R, we can deduce the value of the average pressure F on the pedals"; ibid., 304–5.

82 See Brown, "The Prosthetics of Management," 271.

and mental capacities and instead use test equipment to achieve scientific objectivity.[83] This cyborgization through registering apparatuses supplanted the earlier technique of recording the activity of the observed with the aid of the body-sensory and mental capacities of the observer and made it possible to discover a hidden cosmos of energy flow that had previously been imperceptible to the naked eye. Indeed, even small nuances in pressure, speed, exhaustion—too small to be felt or sensed by the test persons themselves—were now documented through lines or graphs. While the desired harmonious and efficient task performance was always endangered by the insidious approach of "fatigue," the process of "becoming tired" could now be traced before it afflicted the worker.

Inspired by the work of Kostelnick and Kimball, we argue that the graphic rhetorics and the representational quality of mechanical and structural measurement devices, as they have also been applied by Amar, created a kind of supra- or even augmented reality.[84] In other words, Amar, through his mechanical registration and inscription devices, attempted to record a supra-natural, "mediated reality" that only existed because of his apparatuses. Indeed, this mechanical epiphany ennobled his scientific findings, guaranteed truth-value, and made the invisible visible to the eye and comprehensible to the mind of the observer as well as the observed. In his view, the graphs were also excellent learning tools, which made it possible for those observed to observe themselves—in an indirect, abstract, and de-bodied, mechanically mediated way. Amar's scientific cosmos at the time encompassed an innovative approach, combining a particular material-visual setting with specific technical terminology and rhetoric. It also included an at first sight bizarre test equipment, which was often self-made and fabricated from everyday objects. In addition, Amar's aesthetic language of graphs, numbers, and formulas must have created a kind of "scientist's black box," as research results were no longer based on material-physical evidence but on mechanically achieved abstraction.[85]

The question then arises: What role did this "experimental system" force its audiences to play, how did it structure and dominate what the audiences were seeing and thinking?[86] It probably further empowered the scientist—in

83 See De Bont, "Energie in de weegschaal," 26.

84 See Kostelnick and Kimball, "Introduction," 11–12.

85 See Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987).

86 Hans-Jörg Rheinberger, "Epistemische Dinge," in *Handbuch Materielle Kultur: Bedeutungen, Konzepte, Disziplinen*, ed. Stefanie Samida, Manfred K. H. Eggert, and Hans Peter Hahn (Stuttgart: Metzler, 2014), 193–97. See also Herman, Priem, and Thyssen, "Body_Machine?"

FIGURE 5.8 Graphs on the walls of the school's exhibition room. Digital positive from glass plate negative.

his/her role as an expert—and may have undermined the uninitiated's capacity to question or challenge the outcomes that were delivered by experts familiar with the rituals of mechanical objectivity. The graphs as well as the images of the test equipment and the psychophysiological laboratory were rhetorically used and staged as mechanical visualizations in the school's exhibition room (see fig. 5.8), depicting the institute as a Mecca of modern science and pedagogy and projecting a vast positivist faith in the "eye of the machine" and quantification. Abstract graphs as objective, supra-real visual arguments were used to strengthen the outcomes of research and the role of experts. As educational tools, they established a kind of augmented reality for those who were trained. Mechanical objectivity, as a way of observing and testing, thus entered the sphere of education, implying the promise of individualized and customized training. It was a promise that was, ironically, strongly rooted in and inspired by an economic reasoning in times of industrialist capitalism: the optimum performance of the worker for maximized productivity.

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PART 3

Engineering Social Change

CHAPTER 6

Germs, Bodies, and Selves: Tuberculosis, Social Government, and the Promotion of Health-Conscious Behavior in the Early Twentieth Century

Enric Novella

The late nineteenth century witnessed a growing awareness of the importance of poverty, overcrowding, malnutrition, lack of hygiene, and occupational hazards in causing tuberculosis.[1] From the "fashionable" disease of the Romantics, which has traditionally been considered a crucial landmark in the emergence of the modern understanding of the "sick individual,"[2] the (professional and middle-class) public came to view consumption as a threatening social plague, which was closely related, like alcoholism and venereal disease, to the process of industrialization and the bad habits and living conditions of the (urban) working class.[3] Certainly, many authoritative observers had suggested the association of tuberculosis with poverty, physical overexertion, and inadequate diet long before this period, but it was in this age of large population movements, acute social conflicts, and widespread fears of decadence and degeneration that consumption came to be generally viewed as a dark spot in the landscape of industrialization and even as a troublesome "rite of passage to modernity."[4] As French historian Pierre Guillaume has stressed, persons affected by tuberculosis were seen thereafter—especially after Robert Koch

1 Thomas Dormandy, *The White Death: A History of Tuberculosis* (London: Hambledon Press, 1999), 43.

2 Susan Sontag, *Illness as Metaphor* (New York: Farrar, Straus & Giroux, 1978), 27–37; Claudine Herzlich and Janine Pierret, *Illness and Self in Society* (Baltimore, MD: Johns Hopkins University Press, 1987), 24–37. More recently, consumption has also been interpreted as the quintessential condition that paved the way for the modern notion of chronic illnesses. See Carsten Timmermann, "Chronic Illness and Disease History," in *The Oxford Handbook of the History of Medicine*, ed. Mark Jackson (Oxford: Oxford University Press, 2011), 393–410.

3 Michael Worboys, *Spreading Germs: Diseases, Theories, and Medical Practice in Britain, 1865–1900* (Cambridge: Cambridge University Press, 2000), 195–96. See also Pierre Guillaume, *Du désespoir au salut: les tuberculeux aux 19e et 20e siècles* (Paris: Aubier, 1986), 131–69; or, more extensively, David S. Barnes, *The Making of a Social Disease: Tuberculosis in Nineteenth-Century France* (Berkeley: University of California Press, 1995).

4 Mark Harrison, *Disease and the Modern World: 1500 to the Present Day* (Cambridge: Polity Press, 2004), 128.

had established the infectious nature of the disease—as dangerous agents of contamination, thus representing a serious challenge for policy makers and an overt threat to the "societal organism" as a whole.[5] In any case, there is no doubt that the new "social" view of tuberculosis served as a general justification for a new set of attitudes and behaviors. Most important, it provided the legitimation for the discourses and practices of social hygiene whose authoritarian intervention strategies—embedded in what Michel Foucault once described as "social governmentality"[6]—violated the principles of liberalism and invaded the private sphere of the laboring classes with the goal of spreading new values, habits, and ways of life.[7]

In Luxembourg, where the manifold consequences of the country's rapid transformation from a traditional agrarian society into one of the most important sites of the European steel industry were clearly visible at least from the late nineteenth century, these views were widely shared by almost every active member of the national anti-tuberculosis movement.[8] For instance, a report written by a special commission appointed by the government in 1920

5 Pierre Guillaume, "Histoire d'un mal, histoire globale: Du mythique à l'economique," in *Peurs et terreurs face à la contagion: Choléra, tuberculose, syphilis* (*XIXe–XXe siècles*), ed. Jean-Pierre Bardet, Patrice Bourdelais, Pierre Guillaume, François Lebrun, and Claude Quétel (Paris: Fayard, 1988), 159–83.

6 For a general assessment of the historical incarnations of governmentality, see Mitchell Dean, *Governmentality: Power and Rule in Modern Society*, 2nd ed. (London: Sage, 2010).

7 See Linda Bryder, *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth-Century Britain* (Oxford: Clarendon Press, 1988), 142–48; Esteban Rodríguez Ocaña and Jorge Molero Mesa, "La cruzada por la salud: Las campañas sanitarias del primer tercio del siglo veinte en la construcción de la cultura de la salud," in *La salud en el Estado del Bienestar: Análisis histórico*, coord. Luis Montiel (Madrid: Editorial Complutense, 1993), 133–48; Alfons Labisch, "Sozialhygiene: Gesundheitswissenschaften und öffentliche Gesundheitssicherung in der zweiten Hälfte des 19. Jahrhunderts," in *Sei sauber…!. Eine Geschichte der Hygiene und öffentlichen Gesundheitsvorsorge in Europa*, ed. Musée d'Histoire de la Ville de Luxembourg (Cologne: Wienand Verlag, 2004), 258–67; Marjatta Hietala, "Zum Schularzt gehen, Milch trinken, Sport treiben: Hygiene als Volksaufklärung oder Sozialdisziplinierung," in Musée d'Histoire de la Ville de Luxembourg, *Sei sauber…!*, 286–301.

8 The most complete historical survey of the development of Luxembourg's steel industry is to be found in Charles Barthel and Josée Kirps, eds., *Terres rouges: Histoire de la sidérurgie luxembourgeoise*, 6 vols. (Luxembourg: Centre d'ètudes et de recherches européennes Robert Schuman/Archives nationales de Luxembourg, 2009–2018). Its huge significance to the national economy during the first half of the twentieth century is shown by the fact that Luxembourg became the country with the largest per capita steel production in the world, amounting to 5.48 tonnes per inhabitant in 1913 (compared to 0.26 in Germany, 0.17 in England, and 0.12 in France). Around 1950, the iron and steel industry contributed 31 percent to the national GDP. See Gérard Trausch, *Les mutations economiques et sociales de la société luxembourgeoise depuis la révolution française* (Luxembourg: Statec, 2012), 97, 153.

stated that "to fight against this scourge is to fight against all damages caused by the transplantation of humanity and the individual from a world of clean air and healthy and balanced activity to an industrial environment with all its overwork and troubles."[9] The physician Ernest Feltgen, who was the first president of the Luxembourg Anti-Tuberculosis League (founded in 1908), used to provide the following standard explanation for the rise of the social disease of tuberculosis:

> Agriculture is supplanted by industry, which grows at a prodigious pace. This situation results in the development of overcrowded cities, where there is a marked lack of space, air, and sun. It is clear that the victims of these unhealthy living conditions bring forth offspring prone to physical and moral degeneration, offering a fertile ground to host and germinate the virus of social diseases such as tuberculosis.[10]

Furthermore, it was frequently argued that the small country and its economic development had other singularities that created an even more fertile soil for the propagation of infectious diseases, such as its strategic geographical location at the crossroads between central and western Europe and the constant need for foreign workers—coming mainly from southern Italy and other poor regions—of the country's booming mining and metallurgical industry.[11]

In some countries, the national associations and private charities that, starting in France in 1891, carried out the fight against tuberculosis at the turn of the twentieth century were supported or even actively promoted by prominent industrialists. On the one hand, these captains of industry shared the ideology of individual responsibility underlying hygienic discourses; on the other hand, they were obviously concerned about a disease that was responsible for significantly decimating their workforce.[12] Recent research has suggested that questions of labor and economy were indeed the main prisms through

9 Commission Spéciale de Lutte contre la Tuberculose, "La lutte contre la tuberculose par l'hygiène spéciale," 1921, Archives nationales de Luxembourg (henceforth ANLux), folder SP–271. Unless noted otherwise, all translation are the author's.

10 Ernest Feltgen, *Nos principales œuvres pour l'enfance* (Luxembourg: Société d'Hygiène Sociale et Scolaire, 1938), 6.

11 Aline Mayrisch, *Rapport sur l'état actuel de la question de la tuberculose dans le Grand–Duché et sur les meilleures méthodes à suivre pour la résoudre* (Luxembourg: Société de la Croix-Rouge Luxembourgeoise, 1928), 9.

12 Marie-Paule Jungblut, "Öffentliche Gesundheitsvorsorge in Europa: Private Initiative und nationale Reglementierung," in Musée d'Histoire de la Ville de Luxembourg, *Sei sauber...!*, 278–85.

which tuberculosis came to be viewed as a problem for the government, and through which it was problematized as a public health issue.[13] This would certainly explain the eagerness with which many industrialists contributed to the fight against the disease, but also the fact that these campaigns were broadly conceived as truly national endeavors prompting government intervention in order to maintain and safeguard the state's wealth and prosperity.

These considerations seem to be particularly pertinent in the case of Luxembourg's anti-tuberculosis movement, which evolved in a period of strong social and national challenges and soon secured a high degree of support from the country's main industrial companies. Focusing on the important role played by local industrialists and associated circles in the fight against consumption and on the main strategies and events of the ambitious health education campaigns launched in the interwar period, this chapter will show how industry-related entrepreneurship in the domain of tuberculosis prevention and treatment was essentially inspired by educational conceptions and, more particularly, by the goal of creating new patterns of subjectivity and citizenship for the country's working class.

1 The Political Economy of Consumption

Although the real extent of the problem was never thoroughly assessed, there can be no doubt that tuberculosis was Luxembourg's most important public health challenge during the first decades of the twentieth century. And considering the fact that it was a disease that killed primarily young adults—that is, people in the prime of their working life—it is not surprising that, apart from its substantial demographic impact in such a small country, most physicians, as well as politicians and industrialists, were concerned especially about its huge economic effects.

As we have already seen, the emergence of this "white plague" was generally attributed to the process of industrialization and the living conditions of the working class, and many observers blamed particularly the bad habits of the growing number of foreign workers for spreading the disease on Luxembourg soil.[14] This was, for example, the point of view of the Collège Médical, which

13 Alison Bashford, "Tuberculosis and Economy: Public Health and Labour in the Early Welfare State," *Health & History* 4 (2002): 19–40.

14 As Michael Worboys has shown, the "metaphor of seed and soil" remained one key element in the medical understanding of tuberculosis even after the discovery of the infectious nature of the disease, as it allowed constitutional notions to be refashioned in terms

in 1906 stressed the high rates of alcoholism among infected workers and described them in the following terms:

> This poor patient corresponds to the type of the Italian miner, who is often predisposed to tuberculosis due to his physical inferiority. From a constitutional point of view, this type provides a breeding ground for the outbreak of infectious diseases, and most especially tuberculosis, whose germ he often brings from his country of origin.[15]

From the perspective of the workers' movement, things looked, of course, a bit different. Although it recognized that alcoholism was frequently present, it argued that the laboring classes were prone to get infected rather through their exposure to the unhealthy working and living conditions of the modern industrial world. As the social democratic newspaper *Der arme Teufel* (The poor devil) stated:

> As time goes by, the notion according to which the massive spread of tuberculosis is caused by our social conditions is gaining more and more support; consumption cannot be effectively fought as long as poverty and malnutrition, airless houses and alcoholism reduce, as they did in the past, the bodily resilience of millions of workers.[16]

Consequently, it was argued that the fight against tuberculosis should not only include efforts to substantially improve this unhealthy environment; industrialists and the upper classes should significantly contribute to the treatment of those workers who had already been struck by the disease.[17] Echoing these views, several authoritative voices from the country's health professions

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of individual and collective vulnerability linked to certain habits and values. See Worboys, *Spreading Germs*, 193.

15 Collège Médical, *Proposition de loi concernant la création d'un sanatorium dans le Grand-Duché: Avis du Collège Médical* (Luxembourg: Imprimerie de la Cour Victor Buck, 1906), 2. Interestingly, these arguments would appear again in the public discourses on tuberculosis prevention during the economic crisis of the 1930s. For instance, the medical director of the dispensary in the mining and metallurgical city of Esch-sur-Alzette stated in 1934 that, in order to protect the Luxembourgian people, all foreign workers with contagious forms of the disease should be banned from the country. See "Tuberkulose und Ausländer," *Luxemburger Wort*, March 5, 1934.

16 "Die soziale Bedeutung der Tuberkulose," *Der arme Teufel*, April 14, 1923.

17 In 1916, the leftist newspaper *Escher Tageblatt* appealed directly to the Grand Duchess and the country's millionaires to fund the national anti-tuberculosis campaign with their "surpluses." See "Tuberkulose und Krankenhaus," *Escher Tageblatt*, June 23, 1916.

expressed the idea that the financial involvement in the anti-tuberculosis movement was the duty of "our powerful steel industry, for which a good part of our workers sacrifice their health and sometimes their lives."[18] As nurse May Schoué pointed out, it was not only a matter of compensation or moral obligation, since "those who have the greatest interest in controlling this disease as a national epidemic are, first of all, our employers, who need to secure a skilled and efficient labor force and don't want to lose their best and most valuable people to tuberculosis."[19] In fact, most of the country's main steel producers as well as some prominent industrialists took a very active role in this domain and became heavily involved in the funding and leadership of the national anti-tuberculosis movement.

Not long after the Luxembourg Chamber of Representatives had discussed—without any significant outcome—a proposal to build a national sanatorium for consumptives, a small group of personalities headed by Ernest Feltgen, medical director of the reputed thermal facilities at Mondorf-les-Bains, and industrialist and Deputy Nicolas Ludovicy convened to create an association against tuberculosis.[20] By the end of 1907, this "provisional committee" issued a *circulaire* in French and German depicting the dramatic challenge posed by the disease and asking all Luxembourg citizens to join the crusade and become members of the "ligue antituberculeuse."[21] Several months later, the new association held its first general meeting at Luxembourg City Hall, where it elected its first executive board under Feltgen's presidency, appointed a number of special delegates for each of the country's twelve cantons, and approved its statutes, which were validated in January 1911 by the Grand Duchy's government. According to this first public statement, the Ligue Luxembourgeoise contre la Tuberculose (Luxembourg Anti-Tuberculosis League) was constituted as a private entity with the goal of "fighting this scourge with therapeutic means and, most especially, with preventive measures," mainly through the establishment of a small network of dispensaries across the country, the organization of different resources for "children at risk," and ceaseless activity in the domains of propaganda and health education.[22]

18 Collège Médical, *Proposition de loi*, 8.

19 May Schoué, *Eine volkstümliche, gemeinverständige Belehrung über die Tuberkulose als Volkskrankheit und deren Bekämpfung in Luxemburg* (Bonn: Rhenania Druckerei, 1916), 38.

20 Anton Kayser, *Proposition de loi tendant à la création d'un sanatorium populaire antituberculeux* (Luxembourg: Imprimerie de la Cour Victor Buck, 1907).

21 "Ligue antituberculeuse. Liga gegen die Schwindsucht," SD, ANLux, folder SP–272.

22 Ligue Luxembourgeoise contre la Tuberculose, *Assemblée Générale du 5 Avril 1908. Statuts* (Luxembourg: Imprimerie Joseph Beffort, 1908).

The League quickly obtained official recognition as having legal personality—this enabled it to raise funds and receive tax-exempt donations and legacies[23]—and joined the International Association against Tuberculosis. Its members soon included a significant number of the country's physicians, politicians, civil servants, and industrialists, as well as the Royal Family.[24] In fact, until the 1920s, when it became a more popular movement after a series of successful recruitment campaigns, it remained a charity whose members came mostly from the elites and the professional and upper-middle classes. By 1922, the association counted just 680 "paying affiliates,"[25] although these numbers rose to 3,000 in 1928 and to 5,400 in 1935—that is, comprising more than 2 percent of the Grand Duchy's entire population.[26]

As has been already pointed out, from the very beginning many companies and leading figures of the local mining and steel industry were involved and gave personal and financial support to the activities of the League. Executive board members of several outstanding Luxembourg industrial businesses, such as Léon Kauffman, Norbert Metz and, particularly, Émile Mayrisch's wife Aline (née de Saint-Hubert), who in 1921 was appointed vice-president of the League, became key leaders of the movement.[27] This involvement is best appreciated by looking at the sources of funding of the association, whose main

23 Chambre des Députés, *Projet de loi avant pour objet de conférer la personnification civile à la Ligue Luxembourgeoise contre la Tuberculose* (Luxembourg: Imprimerie de la Cour Victor Buck, 1910).

24 In 1911 and 1927, Grand-Duchess Marie-Anne and Grand-Duchess Charlotte respectively accepted the "high patronage" of the League. See Ligue Luxembourgeoise contre la Tuberculose, *1908–1933: 25 années de lutte antituberculeuse dans le Grand-Duché de Luxembourg* (Luxembourg: St. Paul, 1934), 10.

25 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Son organisation, son fonctionnement, ses dispensaires, ses donateurs, sa situation financière* (Paris: Braun & Cie, 1922), 16.

26 Ligue Luxembourgeoise contre la Tuberculose, *Rapport sur le fonctionnement de la Ligue en 1928*, 1929, ANLux, folder SP–272; Ligue Luxembourgeoise contre la Tuberculose, *Rapport du Conseil d'Administration à l'Assemblée Générale du 17 Mars 1935*, 1935, ANLux, folder SP–272.

27 As president of ARBED (Aciéries réunies de Burbach-Eich-Dudelange, a merger of the three largest Luxembourg steelworks brought about in 1911), Émile Mayrisch (1862–1928) was without question the most powerful, charismatic, and influential industrialist of his time and, together with his wife Aline (1874–1947), very active in social and cultural philanthropy. For instance, he introduced several social benefits for his workers, was for many years the president of Luxembourg's Red Cross, and used to gather a "circle" of artists, writers, intellectuals, and politicians at his country residence in Colpach. See, e.g., Nadine Schmitz, "Le paternalisme d'Émile Mayrisch," in Barthel and Kirps, *Terres rouges*, vol. 3, 104–53; Germaine Goetzinger, *Colpach: ein Ort deutsch-französischer Begegnung zur Zeit der Weimarer Republik* (Oldenburg: BIS der Universität Oldenburg, 2004); Klaus

income was donations from the steel industry, at least until the early 1920s. Between 1908 and 1921, for example, these donations—coming mostly from ARBED, Gelsenkirchener Bergwerks-AG, Deutsch-Luxemburgische Bergwerks- und Hütten-AG (later renamed HADIR), and the Metz and Mayrisch families—amounted to over one million francs; in comparison, government subsidies only reached around 110,000 francs during the same period.[28] Gradually, these sums decreased and were surpassed by public funds and other means, such as the lucrative annual lottery that the League was authorized to sell from 1922 onwards.[29] Nevertheless, industrial sources remained the most important single contributor to the treatment costs of tuberculosis through participation in the newly created *Établissement d'Assurances Sociales* (Social Insurance Institute)—which in the interwar period took an increasing role in this domain[30]—and the development of its own care resources for tuberculous workers and their families.

Following the celebrated examples of Edinburgh (1887), Liège (1900), and especially Lille (1901), the League's most relevant institutional creations and the cornerstones of its activity were undoubtedly the dispensaries.[31] According to the League's first annual report, the dispensaries had "an exclusively educational character refraining from every kind of therapy" and were responsible for the screening of infected persons and their families, the supervision of their housing conditions, the provision of material relief for poor consumptives, the delivery of spittoons, the performance of disinfections, and the referral of "appropriate" cases to sanatorium treatment.[32] The first dispensary opened in Luxembourg City in August 1908, others followed in the country's main population centers, including Esch-sur-Alzette (1910), Ettelbruck (1910), Dudelange (1913), Differdange (1921), Grevenmacher (1921), Rédange (1921), Wiltz (1921), and Echternach (1936).

Dittrich, "Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period" (in this volume).

28 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Son organisation*, 37–39.

29 Ligue Luxembourgeoise contre la Tuberculose, *1908–1933*, 8–9. Other (less important) funds came from the annual membership fees, the sale of flowers, and the periodic celebration of social events, parties, and benefit concerts.

30 Denis Scuto, "La naissance de la protection sociale au Luxembourg," *Bulletin luxembourgeoise des questions sociales* 10 (2001): 39–59.

31 María José Báguena Cervellera, *La tuberculosis y su historia* (Barcelona: Fundación Uriach 1838/1992), 67–68. In regard to dispensaries, Luxembourg was very much influenced by French and British practices. On French dispensaries, see Guillaume, *Du désespoir au salut*, 205–215; on British experiences, Bryder, *Below the Magic Mountain*, 33–36, 72–75.

32 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Compte rendu de la Ligue Nationale Luxembourgeoise contre la Tuberculose*, 1908–1909, 1909, ANLux, folder SP–272, 2–4.

As Auguste Delahaye, medical director of the dispensary in Luxembourg City, explicitly stated, it was clear from the outset that these institutions did not target the upper classes but that their main goal was to launch a thorough educational offensive among the working class in order to control the spread of the disease:

> Our dispensaries are institutions whose primary purpose is to protect from tuberculosis the poor and the working class. It is in these popular circles where we have to seek out workers and indigents affected by the disease; and it is through an active and continuous propaganda that we need to attract them to the dispensary and instil into their minds the absolutely essential notions of their illness and the hygienic measures they have to follow for their own interest and that of their environment.[33]

In fact, from 87 new cases of tuberculosis—out of 239 consultations—which were diagnosed in his dispensary in its first eight months of activity, Delahaye could confirm that around 20 percent were metallurgical workers, 21 percent had a familial history of the disease, and more than 33 percent were housed in inadequate conditions.[34] Apart from bad housing, and according to conventional medical opinion, Delahaye pointed out the central role of overwork (*surmenage*) and insufficient nutrition in order to account for this high proportion of industrial workers.[35] Other authors more specifically attributed the disease to mining and metallurgical work, which tended to facilitate contagion through the inhalation of dust and other respiratory-damaging substances.[36] Not surprisingly, the country's steel industry gave support to the League's network of dispensaries, with ARBED and HADIR funding the dispensaries in Dudelange and Differdange respectively.

33 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Compte rendu*, 2.

34 According to its annual reports, from 1908 to the outbreak of World War I, over 1,100 persons out of around 4,300 consultations were diagnosed with tuberculosis at the League's dispensaries. See Ligue Nationale Luxembourgeoise contre la Tuberculose, *Rapport moral, médical et financier sur l'exercice 1914 présenté à l'assemblée générale des sociétaires du 28 mars 1915. Statuts* (Luxembourg: Imprimerie de la Cour Victor Buck, 1915).

35 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Compte rendu*, 3.

36 Schoué, *Eine volkstümliche, gemeinverständige Belehrung,* 28. In England, for instance, this association received special attention due to the high rates of pulmonary tuberculosis in industries with pneumoconiosis risk such as tin and copper mining, metal-grindery, and extraction and processing of slate. See Bryder, *Below the Magic Mountain*, 126. See also Francis B. Smith, *The Retreat of Tuberculosis, 1850–1950* (London: Croom Helm, 1988), 212–16.

In this context, it is worth quoting Aline Mayrisch, who personally organized and supervised the League's dispensaries from 1921 and who noted that "a society for the fight against tuberculosis without dispensaries would be like an army without intelligence and scout services."[37] In order to improve this particular kind of service, one of her first initiatives was therefore to hire two visiting nurses, Elise Kauffeld and Anna Stirn, who had received special training in Paris and Brussels and were attached to the dispensaries in Luxembourg City and Dudelange. Within a short time, these nurses became key figures of the anti-tuberculosis movement and took charge of the majority of the dispensaries' daily activities, forming a veritable phalanx of surveillance and health education practices. Considering their experience and expertise, the League proposed to expand their tasks and duties in the 1920s to the fight against poverty and all social diseases as "hygiene instructors for mothers and housewives, and for all sectors of the population which are not sufficiently trained in this regard."[38] This led some years later to the emergence of related professions, such as so-called polyvalent nurses, social hygiene assistants, and social workers.[39]

The League also played an important role in the creation and maintenance of the small network of sanatoriums for consumptives established in Luxembourg in the first third of the twentieth century. As we have seen, the project of creating a national sanatorium for the treatment of tuberculosis had been presented to the Chamber of Representatives as early as 1906, and it was discussed again in 1918.[40] In this context, the League, in 1911, received a donation of 312,500 francs from Léopold Richard, one of the richest steel barons in the country, with the explicit stipulation that a sanatorium be built in the northern

37 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Son organisation*, 23.

38 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Question des dispensaires*, SD (1928), ANLux, folder SP–287, 2.

39 Marco Hoffmann has stated that "unlike other countries, where poverty was at the origin of professional social work, Luxembourg did not know this process. The causes and social impact of tuberculosis paved here the way for social professions." Marco Hoffmann, *Le développement du travail social au Luxembourg à travers l'activité centenaire de la Ligue Médico-Social* (Luxembourg: Ligue Luxembourgeoise de Prévention et d'Action Médico-Sociales, 2008), 8. See also Ligue Luxembourgeoise contre la Tuberculose, *1908–1933*, 18–20; Fernande Gretsch, "L'assistante d'hygiène sociale: Évolution d'une profession," in *Ligue Luxembourgeoise contre la Tuberculose 1908–1968* (Luxembourg: Imprimerie de la Cour Joseph Beffort, 1968), 47–52.

40 "Proposition de loi betreffend Bau eines Sanatoriums zur Aufnahme an Tuberkulose erkrankter Frauen und Kinder," December 6, 1918, ANLux, folder CdD–2723.

city of Wiltz.[41] Shortly afterwards, the League's executive board acquired a plot of land and launched an architectural competition for the building, but the outbreak of World War I forced a delay to the project and, finally, construction work had to be stopped in 1920 because of rising post-war inflation and manpower costs.[42]

After the Social Insurance Institute had opened two provisional sanatoriums for male patients at the commune of Feulen and the forest of Baumbusch in 1915 and 1919 respectively,[43] ARBED established a small "sanatorium annex for the rational treatment of tuberculous workers" at the factory hospital in Dudelange.[44] Similarly, the League opened a sanatorium for around fifty women in a spacious property given by the city of Dudelange. This house, inaugurated in 1923 and staffed by Franciscan Sisters, was the only treatment site directly managed by the League, which also paid, if necessary, the cost of stays in Belgian, French, Swiss, and German institutions. Luxembourg's sanatorium movement was finally completed in 1931, when the Social Insurance Institute closed the premises in Feulen and Baumbusch and opened a sanatorium for 150 (male) patients in an idyllic mountain resort near the historic village of Vianden.[45]

According to contemporary beliefs about the virtues of institutional treatment, all these sanatoriums were designed to isolate patients in the early stages of the disease and—following the notion that had originated in Germany in the second half of the nineteenth century—provide them with the conventional regimen of rest, fresh air, and good food.[46] But in most cases, the main goal of sanatorium treatment was related to making patients regain their

41 Léopold Richard to Dr. Feltgen, September 13, 1910, ANLux, folder SP–271. See also Ligue Nationale Luxembourgeoise contre la Tuberculose, *Rapport moral, médical et financier sur l'exercice 1911 présenté à l'assemblée générale des sociétaires du 31 mars 1912* (Luxembourg: Imprimerie P. Worré-Mertens, 1912), 11.

42 "Construction d'un sanatorium populaire à Wiltz: Programme du concours," May 21, 1913, ANLux, SP–268. See also Ligue Luxembourgeoise contre la Tuberculose, *1908–1933*, 21. After the League was ordered to compensate the local architect who had originally won the contest for breach of contract, the project was abandoned for good and the premises in Wiltz were sold to the state in 1929.

43 See "Le sanatorium de l'établissement d'assurance contre la vieillesse et l'invalidité à Feulen," *Luxemburger Illustrierte* 45 (1925): 340; Henri Kugener, "Das Sanatorium im Baumbusch," *Ons Stad* 100 (2012): 66–70.

44 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Rapport sur l'exercice 1917*, 1918, ANLux, folder SP–209.

45 Ligue Luxembourgeoise contre la Tuberculose, *1908–1933*, 22–24.

46 On the foundations of the sanatorium movement in the United States and Europe, see Mark Caldwell, *The Last Crusade: The War on Consumption, 1862–1954* (New York: Atheneum, 1988); Flurin Condrau, *Lungenheilanstalt und Patientenschicksal: Sozialgeschichte der*

ability to work through a strict regimen of graded exercise and activity.[47] This explains not only the fact that the majority of beds in Luxembourg's sanatoriums was reserved for male workers but also the significant involvement and support given to these institutions by the country's industries. The house rules at the League's sanatorium in Dudelange, for instance, stated explicitly that "a precondition for admission is that full recovery or a significant improvement can be expected after institutional treatment, so that long-term earning capacity can be restored."[48]

To be sure, sanatoriums were not only clinical sites for the implementation of medical knowledge, but also pedagogical enterprises with vast educational objectives.[49] As physician Anton Kayser declared in 1906, the creation of a popular sanatorium in Luxembourg was "a work of the utmost urgency and public utility," insofar as it would constitute "a school that will carry out a large part of the people's hygienic education."[50] The crucial role of health education was repeated in almost every publication dealing with the nature of sanatorium treatment, which was supposed to act as a sort of "educational cure, [where] the doctor holds the whole life of the patient in his hands."[51] According to Prosper Schumacher, medical director of the sanatorium in Vianden, the stay at the institution should enable patients to become "their own best doctors," so that they could keep themselves healthy (and productive) as long as possible after discharge.[52]

Following the broad international trend of refocusing efforts away from treating tuberculosis in adults to preventing the development of clinically active disease in so-called "pretubercular" or "tuberculosis-threatened" children, the League and related circles also put a strong emphasis on paediatric activities.[53] In fact, in Luxembourg as elsewhere in the Western world, the fight

Tuberkulose in Deutschland und England während des späten 19. und frühen 20. Jahrhunderts (Göttingen: Vandenhoeck & Ruprecht, 2000).

47 See Bryder, *Below the Magic Mountain*, 54–67, 157–73; Bashford, "Tuberculosis and Economy," 25–27.

48 Liga gegen die Tuberkulose, "Aufnahmebedingungen des Sanatoriums für weibliche Lungenkranke in Düdelingen," *Der arme Teufel*, February 10, 1923.

49 See Bryder, *Below the Magic Mountain*, 54–67; Rodríguez Ocaña and Molero Mesa, "La cruzada por la salud," 143–44.

50 Kayser, *Proposition de loi*, 3.

51 Schoué, *Eine volkstümliche, gemeinverständige Belehrung,* 38.

52 Prosper Schumacher, *Was muss jeder von der Tuberkulose wissen?* (Luxembourg: Luxemburger Verlagsanstalt, 1927), 15.

53 On these categories and related practices, see Cynthia Connolly, "Pale, Poor and 'Pretubercular' Children: A History of Pediatric Antituberculosis Efforts in France, Germany, and the United States, 1899–1929," *Nursing Inquiry* 11 (2004): 138–47; Teemu Ryymin,

against tuberculosis played a key role in the development of many child welfare provisions, from school medical services to different initiatives set up to treat or protect children because of their poor health, sick parents, or hygiene and dietary deficiencies at home.[54] Each of these interventions linked up the social and the medical, as this hygienic crusade was fed by a child-saving ethos that focused upon the poor and made working-class children the objects of surveillance, classification, and treatment.[55] So, for instance, the Mayrisch family, between 1911 and 1913, sent a small group of children to a clinic in the German town of Bad Kreuznach, and between 1928 and 1938, the League, ARBED, and the city of Luxembourg booked a fixed amount of places for three-month stays at the preventoriums of Clemskerke and Breedene in Belgium.[56]

Together with the organization of holiday colonies in the spa resort of Mondorf-les-Bains and other locations across the country, these efforts crystallized in the introduction of three institutions that had originated in Germany, the United States, and France respectively. The first of these were the "forest" or "open-air" schools in Dudelange (1913) and Esch-sur-Alzette (1928), opened by ARBED in the wake of a report by a visiting commission on the pioneering centers of Charlottenburg, Elberfeld, and Mönchengladbach in Germany. These schools were designed to both promote health and re-educate "weak" or "sickly" children through a loose program combining regular lessons with respiratory exercises, sunbaths, (over)feeding, and rest, and were commonly attended by children from poor families associated with the local steel industry.[57] The second set of institutions were the preventoriums opened in the early 1920s in the cities of Bettendorf and Remich by Franciscan Sisters and Sisters of Saint Elizabeth and, particularly, the so-called *Maison des Enfants* installed by ARBED at the old Mayrisch family home in Dudelange. Following the therapeutic regimen developed by Belgian physician Émile Spehl, this resort comprised a preventorium with fifty-six beds and a sanatorium with eighteen beds, and it provided a safe and strictly supervised environment where employees'

"'Tuberculosis-threatened Children': The Rise and Fall of a Medical Concept in Norway, c. 1900–1960," *Medical History* 52 (2008): 347–64.

54 Nelleke Bakker, "Fresh Air and Good Food: Children and the Anti-Tuberculosis Campaign in the Netherlands, c. 1900–1940," *History of Education* 39 (2010): 343–61.

55 See here the essays included in Roger Cooter, ed., *In the Name of the Child: Health and Welfare, 1880–1940* (London: Routledge, 1992).

56 Feltgen, *Nos principales œuvres pour l'enfance*, 10. For its part, the local division of the Socialist Party in Esch-sur-Alzette every year sent a group of fifty selected children to a beach resort in the Belgian village of Lombartzyde.

57 Geert Thyssen, "The Open-Air Schools of Dudelange and Esch-sur-Alzette," *Forum für Politik, Gesellschaft und Kultur* 301 (2010): 40–42.

children—especially those exposed to the possibility of contagion within their families—were instructed in the manifold benefits of a hygienic way of life.[58] Finally, the last institutional practice consisted in placing "children at risk" with peasant families in the countryside, a practice popularized by the French *Œuvre de Préservation de l'Enfance contre la Tuberculose* (Childhood Preservation Work against Tuberculosis) founded by pediatrician Jacques-Joseph Grancher in 1903.[59] In Luxembourg, this approach was introduced in 1928 by the Red Cross in the western commune of Redange, operating as a care center which distributed up to fifty small children "who should be separated from their families due to risk of tuberculosis infection."[60]

As Cynthia Connolly has shown for other countries, each of these institutions—supported by industry, the League, the state, and other relevant actors—was a joint public-private venture and "did not just expose children to fresh air, provide good food and teach them hygiene; they also emphasised the importance of making children productive citizens of a nation-state."[61] In this sense, and like many other initiatives in the health care sector, they were not only cheap alternatives to structural solutions for the workers' poor health and living conditions, but also an expression of the increasing modern tendency to "educationalize" social problems through institutions held accountable for solving them.[62] "The patients," as the League's president Ernest Feltgen once put it, "are victims of abnormal social states and, in return, they undermine the foundations of society"; in his view, there was only one way of reversing this state of affairs resulting from "the conditions of modern life," namely by creating healthy citizens through ambitious educational initiatives focused on working-class children:

> A big effort must be made to pull delicate plants out of the unhealthy environment where they pale lacking air and light, to transplant them into an oxygen-rich medium … and to open new horizons to young minds which were hitherto confined to slum walls, narrow roads without

58 ARBED, *Œuvres sociales* (Luxembourg: Victor Buck, 1922), 23–37. On the origins of preventoriums, see Cynthia Connolly, *Saving Sickly Children: The Tuberculosis Preventorium in American Life, 1909–1970* (New Brunswick, NJ: Rutgers University Press, 2008).

59 On Grancher, see Michèle Becquemin, *Protection de l'enfance et placement familial: La Fondation Grancher. De l'hygiénisme à la suppléance parentale* (Paris: Petra, 2005).

60 Croix-Rouge Luxembourgeoise, "Statuts du premier centre de placement familial," SD, ANLux, folder SP–003; see also Feltgen, *Nos principales œuvres pour l'enfance*, 11–12.

61 Connolly, "Pale, Poor and 'Pretubercular' Children," 144.

62 Marc Depaepe and Paul Smeyers, "Educationalization as an Ongoing Modernization Process," *Educational Theory* 58 (2008): 379–89.

> sunshine, and the black chimneys of the factories … Social progress cannot be achieved without men in a state of complete bodily and mental health.[63]

Certainly, ARBED and other companies als undertook some "structural" initiatives, with the improvement in working conditions prescribed (among others) by the "Law concerning security and health in industrial and commercial companies" passed in 1903,[64] as well as the introduction of social benefits, such as pensions for widows and orphans, free attendance of vocational schools and kindergartens, food at reduced prices, and, more specifically, the construction of *cités ouvrières* (housing colonies).[65] In doing so, industrialists met long-standing demands by social activists which were first voiced in 1907 in an influential report on the "housing conditions of poor workers in Luxembourg" drawn up by the Verein für die Interessen der Frau (Association for the Interests of Women),[66] and their initiative was enthusiastically praised by prominent professionals involved in the anti-tuberculosis campaign.[67] But these programs only reached a small number of workers, and—as an internal ARBED document explicitly recognized—they were not intended as a result of a new "labor policy," but derived solely from "irrefutable community-oriented considerations!"[68] For the most part, then, industry-related entrepreneurship in the domain of tuberculosis prevention and treatment aimed first and foremost at the rehabilitation of the labor force, and it was based, as we have seen,

63 Feltgen, *Nos principales œuvres pour l'enfance*, 6–7.

64 See Jean J. Lentz, *La lutte contre la tuberculose dans le Grand-Duché de Luxembourg* (Luxembourg: Imprimerie de la Cour Joseph Beffort, 1934), 21–26.

65 See Antoinette Lorang, *L'image sociale de l'ARBED à travers les collections du Fonds du Logement* (Luxembourg: Le Fonds du Logement, 2009), 69–85. The important role of housing policies in the development of preventive medicine during the first third of the twentieth century has been emphasized by Dorothy Porter, *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times* (London: Routledge, 1999), 142.

66 According to this report, housing shortage was "the root of all material and moral evil," and it was easy to see that "every day this reform is postponed, it takes a particularly hard toll on women and children, that is, on the whole future generation of our workers and small artisans." Verein für die Interessen der Frau, *Einiges über Wohnungsverhältnisse der ärmeren Arbeiterbevölkerung in Luxemburg* (Luxembourg: Druck von M. Huss, 1907), 5.

67 "Luxembourg's industry has masterfully cooperated in the realization of these principles by providing beautiful homes for their workers and employees. Nice apartment colonies where families can live healthily and happily have thus developed around our industrial centers." Schumacher, *Was muss jeder von der Tuberkulose wissen?*, 10.

68 "Die Sozialeinrichtungen der Vereinigte Hüttenwerke Burbach-Eich-Düdelingen AG ARBED in Luxemburg," 1942, ANLux, folder AES–U1–310.

on pervasive health education practices through different strategies and institutions who targeted mainly the members and the offspring of the (urban) working class.

2 Tuberculosis, Social Government, and the Self

"Tuberculosis," Dr. Prosper Schumacher stated in 1927, "is a disease of ignorance."[69] Without question, this notion was from the outset one of the main axes of anti-tuberculosis action in Luxembourg, and even before the League's foundation, the fight against consumption generated a broad range of initiatives in the domain of health propaganda. As early as 1903, the country's government printed and distributed a German-language booklet which contained strict guidelines for the prevention and treatment of the disease—including "safe disposal of sputum," "absolute cleanliness," "avoidance of debauchery," and, most especially, the "right combination of information and self-control," arguing that, insofar as "everybody [was] able to host the germ of the enemy, everybody [had] to be prepared for the fight against it."[70]

According to Ernest Feltgen, the improvement of national health should thus start with a thorough and continuous "hygienic education" of the masses, and these actions should, of course, focus on the key institution of the school: "It would be unfair to say that we have done nothing in terms of hygiene, but it is true that we need to do much more, especially in the field of the hygienic education of the people, which needs to start at school."[71] Consequently, one of the main impetuses for the deployment of sustained and systematic efforts in health propaganda was the creation of the Verein für Volks- und Schulhygiene (Society for Social and School Hygiene) in 1904. Believing that "each human being represents a certain capital from a physical and moral point of view" and that "this capital has to be improved,"[72] a group of teachers, physicians,

69 Schumacher, *Was muss jeder von der Tuberkulose wissen?*, 7. Some years later, Schumacher outlined the "ten commandments of tuberculosis care"; see Prosper Schumacher, *Wissenswertes über die Tuberkulose: Allgemeine Belehrungen* (Vianden: Petingen, Meyer & Hueber, 1939), 24.

70 *Tuberkulose-Merkblatt bearbeitet im deutschen kaiserlichen Gesundheitsamte* (Diekirch: Imprimerie J. Schroell, SD), 1–2. The content of this booklet was also reproduced in the leading newspaper *Luxemburger Wort* from September 29 to October 1, 1903.

71 Ernest Feltgen, *Schulhygienische Mitteilungen vom Internationalen Tuberkulose-Kongress (Paris, 2–7. Oktober, 1905)*, (Luxembourg: n.p., 1905), 27.

72 Nicolas Wampach, "La Société Luxembourgeoise d'Hygiène Sociale et Scolaire depuis sa fondation jusqu'à nos jours," *Revue d'hygiène sociale de Strasbourg* 5 (1923): 73–77, quotation on 73. As Marjatta Hietala put it, "educational work in this domain was founded on

and other professionals headed by Feltgen and school inspector Theodor Witry founded this association with the goal of "spreading the lessons of health care, especially in the country's schools."[73] In the following decades, the society was very active in demanding the recruitment of school doctors, the installation of nurseries, or the construction of affordable houses, and it published a series of booklets and posters and organized several events—such as study tours, public lectures, conferences, courses, and film showings—devoted to the fight against tuberculosis and other "social maladies." In fact, the National League against Tuberculosis largely grew out of the Society for Social and School Hygiene, and both organizations shared members and cooperated closely in the realization of popularization activities.[74]

Beyond the placement of informative posters in railway stations and public buildings and the establishment in 1914 of a national day against tuberculosis on June 14,[75] these activities were intensified after 1920 as a result of the recommendations of the government commission mentioned above and, more particularly, of the visit to Luxembourg of the American Delegation for the Preservation of Tuberculosis in France funded by the Rockefeller Foundation.[76] From May 10 to 17, 1920, a small group of this delegation—whose original goal was "to encourage the establishment of dispensaries, to develop centers for the

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the belief that the most important resource of a nation was its people"; Hietala, "Zum Schularzt gehen," 292. On contemporary concerns regarding the quality and quantity of the population and their role in fostering public health campaigns, see Porter, *Health, Civilization and the State*, 174–177; and, more specifically, William H. Schneider, *Quality and Quantity: The Quest for Biological Regeneration in Twentieth-Century France* (Cambridge: Cambridge University Press, 2002); Virginia De Luca Barrusse, *Population en danger! La lutte contre les fléaux sociaux sous la Troisième République* (Bern: Peter Lang, 2013).

73 Verein für Volks-und Schulhygiene, *Statuten des Vereins* (Luxembourg: Druck von M. Huss, 1904), 3.

74 Wampach, "La Société Luxembourgeoise d'Hygiène Sociale et Scolaire," 75. In this context, it is interesting to note that one of the first activities of the League was the installation, at the Luxembourg City Hall, of an exhibition on tuberculosis which had originally been assembled by the German physician August Dietz in Darmstadt. According to the first annual report of the League, the exhibition was a huge success and was visited by almost 10,000 people. Ligue Nationale Luxembourgeoise contre la Tuberculose, *Compte rendu*, 2.

75 Ligue Nationale Luxembourgeoise contre la Tuberculose, *Son organisation*, 11–13. This "national day" was introduced in most Western countries, although the dates varied. See Dominique Dessertine and Olivier Fauré, *Combattre la tuberculose, 1900–1940* (Lyon: Presses Universitaires de Lyon, 1988), 128–38.

76 On the history of this delegation and its significant impact on the French campaign, see Lion Murard and Patrick Zilbermann, "La mission Rockefeller en France et la création du Comité national de défense contre la tuberculose (1917–1923)," *Revue d'histoire moderne et contemporaine* 34 (1987): 257–81.

training of visiting nurses and physicians," and, most especially, "to conduct an energetic educational campaign on a national scale"[77]—visited the Grand Duchy at the League's request and offered a series of public lectures and film sessions for the general public.[78] Thanks to this and other actions resulting from its international relations,[79] the League acquired in 1922 its own "tuberculosis museum" and started organizing temporary exhibitions—often scheduled as part of so-called "tuberculosis weeks"—and similar activities across the country, sometimes alone and sometimes in collaboration with other private charities or public institutions. For instance, it provided broad support to the *Volksgesundheitswoche* (Public Health Week) celebrated in August 1926 in Luxembourg City,[80] and it also actively promoted the big exhibitions of the German Hygiene Museum, "Der Mensch" (The Human Being) and "Das Leben" (Life), which were shown at the capital's city hall in 1928 and 1938 respectively.[81]

The pervasiveness of health education and propaganda is very illuminating in regard to the nature, reasons, and objectives of the thorough tuberculosis-centered sanitary offensive deployed in Luxembourg in the decades before World War II. On the one hand, the adoption of a new hygienic culture on the part of the population was seen—in the Grand Duchy as elsewhere—as the shortest way to achieve social peace and individual harmony and was often depicted as a veritable utopia. As sociologist Jean J. Lentz concluded in a detailed study of the anti-tuberculosis movement in Luxembourg, "The day man has learned to observe, to judge, and to constrain himself according to his needs, not only will the fight against the many scourges that afflict humanity have taken a big step forward, but the Golden Age awaiting men for ages will

77 The Rockefeller Foundation, *Annual Report* (New York, 1920), 97.

78 "Die Mission Rockefeller gegen die Tuberkulose in Luxemburg," *Luxemburger Wort*, May 11, 1920.

79 In this context, it is important to mention the visits to Luxembourg, in May 1925 and June 1926, of Lucien Viborel, propaganda director of the French Comité National de Défense contre la Tuberculose (National Defense Committee Against Tuberculosis). Other prominent foreign speakers invited by the League included the president of the International Union against Tuberculosis Léon Bernard (1921), Dr. Camille Guerin (1929), Professor Fernand Besançon (1930), and Dr. Karl Hansen (1931). See Ligue Luxembourgeoise contre la Tuberculose, *1908–1933*, 12–13.

80 "Zur Volksgesundheitswoche," *Luxemburger Wort*, August 14, 1926.

81 It has been calculated that the first of these exhibitions was attended by over 25,000 visitors, almost 10 percent of the Grand Duchy's entire population. See Henri Kugener, "'In Spiritus gesetzte Naturseltenheiten, geburtshülfliche Präparate, Fötusse in allen Formen': Zu den Wanderausstellungen des Deutschen Hygiene-Museums in Luxemburg 1928 und 1938," in Musée d'Histoire de la Ville de Luxembourg, *Sei sauber…!*, 306–15.

break forth on the horizon."[82] On the other hand, it is obvious that this hygienic culture was a project of the country's economic and professional elites, who imposed their health-related values, habits, and ways of life on the poor and working classes. Consequently, apart from preserving and improving the labor force, anti-tuberculosis action was—just like the fight against other social "scourges" of the period, such as alcoholism or venereal disease[83]—a way of confronting the manifold social problems associated with the new conditions of modern industrial life (poverty, inequality, cultural uprooting, urbanization, etc.) through the (neutral) concept of health. And, as Alfons Labisch has pointed out, although "popular hygiene" and health education practices were based "on altering behavior through rational understanding, not on altering social conditions," this "offer of value-free 'health' as a scientifically-based mode of life" was ultimately very difficult to reject by the lower and subordinate classes.[84]

To sum up, anti-tuberculosis action in the Grand Duchy helped shape a comprehensive set of discourses and practices that encouraged the spread of health-conscious behavior and aimed at creating a "new worker" and a "new citizen" along the lines of the so-called "homo hygienicus"—that is, an individual who commits to keeping himself healthy for his own interest but also for his nation's sake.[85] If hygiene and health education practices are thus essential

82 Lentz, *La lutte contre la tuberculose*, 130. As we have already seen, this emphasis on self-control was common in almost every publication dealing with the fight against tuberculosis. In the words of nurse May Schoué, "on the threshold of the new era [of social hygiene], self-control is one of the main characteristics of the human being." May Schoué, *An der Schwelle einer neuen Zeit* (Luxembourg: St. Paulus Druckerei, 1920), 2.

83 On the close relationship between the three "crusades" (tuberculosis, venereal disease, and alcohol), see Christopher Lawrence, "Continuity in Crisis: Medicine, 1914–1945," in *The Western Medical Tradition, 1800 to 2000*, ed. W. F. Bynum, Anne Hardy, Stephen Jacyna, Christopher Lawrence, and E. M. Tansey (Cambridge: Cambridge University Press, 2006), 340–43. In Luxembourg, for instance, the three movements shared discourses, strategies, and protagonists, mainly though the transversal activity of the Society for Social and School Hygiene. See Wampach, "La Société Luxembourgeoise d'Hygiène Sociale et Scolaire."

84 Alfons Labisch, "Doctors, Workers and the Scientific Cosmology of the Industrial World: The Social Construction of 'Health' and the 'Homo Hygienicus,'" *Journal of Contemporary History* 20 (1985): 599–615, quotations on 605 and 608.

85 Labisch, "Doctors, Workers and the Scientific Cosmology of the Industrial World," 610–12. See also Porter, *Health, Civilization and the State*, 143: "It was no longer enough for individuals to heed their own health, as had been urged by the Enlightenment ideology of individual hygiene; they must be made conscious of the social impact of individual behaviour upon the health of the community."

components of modern citizenship and nationhood,[86] the history of tuberculosis, in Luxembourg as elsewhere, represents perhaps one of the best ways of understanding the making of this constitutive relationship.

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86 Porter, *Health, Civilization and the State*, 7.

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CHAPTER 7

Transatlantic Iron Connections: Education, Emotion, and the Making of a Productive Workforce in Minas Gerais, Brazil (ca. 1910–1960)

Irma Hadzalic

1 Introduction

"The steel industry is by far the most important factor in our national economy, to the point that we can say today that the fate of the entire country is intimately linked to that of the industry."[1] The Luxembourg sociologist and economist Jean Joseph Lentz (1906–1949) was indeed correct about the importance of the steel industry in Luxembourg in the early twentieth century. Until the mid-nineteenth century, Luxembourg had been a poor agricultural country, a country of emigration.[2] The discovery of iron in the 1850s accelerated the country's economic growth, and by the beginning of the twentieth century Luxembourg had become the fifth largest iron producing country in the world. Its most prominent steel producer, ARBED, founded in 1911, became Luxembourg's "machine of progress" whose motor depended on a workforce that did not yet exist.[3] Lured by the promises of this fast-growing industry, German, Italian, and later Portuguese laborers

1 Jean J. Lentz, *La lutte contre la tuberculose dans le Grand-Duché de Luxembourg: Etude sociale et recueil des textes* (Luxembourg: Imprimerie de la Cour Joseph Beffort, 1934), 13. Unless otherwise noted, all translations are the author's.

2 For a short summary of the different waves of Luxembourgian emigration to the Americas, see Claude Wey, "L'histoire des migrations entre le Luxembourg et les Amériques," in *Retour de Babel: itinéraires, mémoires et citoyenneté* (Luxembourg: Éditions Retour de Babel, 2007), 31–40.

3 ARBED was the result of a merger of the Burbach, Eich, and Dudelange steel producing companies. For a more detailed history of the mergers of steel companies, see Gustavo Lins Ribeiro, "Learning from Minas Gerais: Flows of Capital, Production, and Managerial Models Within the Steel Industry," in *Industry and Work in Contemporary Capitalism: Global Models, Local Lives?*, ed. Victoria Goddard and Susana Narotzky (London: Routledge, 2015), 91–104; Félix Chomé, *ARBED: Un demi-siècle d'histoire industrielle 1911–1964* (Luxembourg: ARBED, 1972). ARBED is described as the "machine of progress" in a newspaper article on an excursion of Luxembourg orphans (*Rhamkinder*) to the open-air schools created by ARBED; see "Ausflug der Rhamkinder ins Minettebassin," *Luxemburger Wort*, July 9, 1949.

came to the country's rescue.[4] From a country of emigration, Luxembourg transformed itself into a magnet for immigrants, and its southern industrial parts doubled in population between 1890 and 1910.[5] In the first decade of the twentieth century, more than half of Luxembourg's population was employed in the steel-making business. This created new challenges, such as providing sufficient and appropriate housing and health facilities as well as education and training for the workers and their children. Fully aware that the future of their company to a large extent depended on their workers' well-being, ARBED's leaders launched a series of social initiatives to improve the lives of their employees. They understood that a skilled and healthy workforce would ultimately have a positive effect on the company's financial situation.

Across the Atlantic Ocean, in Brazil, there was an equally strong demand and need to build up the steel industry. Plans to develop and modernize steel production were of major importance to the Brazilian political elite of the time, but their implementation posed serious dilemmas. While Brazil's soil was rich in iron—especially in the Minas Gerais region—technological and expertise problems persisted. A small steel company called Companhia Siderúrgica Mineira was created in 1917 in the city of Sabará in Minas Gerais, but given its lack of technological know-how, and with the national market relying only on imported products, it was doomed to fail. Moreover, Brazilian politicians were fighting the North American monopoly over the steel market and thus desperately looking for other investors.[6] Since ARBED, at the time, was planning to expand to other continents, the idea to cooperate with Brazilian steel producers was quickly realized through the creation, in 1921, of the Companhia Siderúrgica Belgo-Mineira in Sabará, Minas Gerais.[7] As we will see in this chapter, ARBED's leaders not only brought their steel producing expertise to Brazil but also their Luxembourgian ideas of social welfare. One engineer in particular, Louis Jacques Ensch (1895–1953), was highly influential in disseminating and implementing these ideas.

While much has been written about ARBED's social initiatives in Luxembourg, there has been little research on the company's influence on social

4 For more information on (Italian) immigration to Luxembourg, see Antoinette Reuter and Claudio Cicotti, *Rêves d'Italie, Italies de rêve: Imaginaires et réalités autour de la présence italienne au Luxembourg et dans la Grande Région* (Luxembourg: University of Luxembourg, 2008).

5 Ben Fayot, "Merci au 'Minettsdapp'!," *Forum* 304 (2011): 39.

6 See, for example, François Moyen, *A história da Companhia Siderúrgica Belgo-Mineira: Uma trajetoria de crescimento consistente (1921–2005)* (Belo Horizonte: Acelor Brasil, 2007); Antonio José Polanczyk, *Louis Ensch e a Belgo-Mineira* (Belo Horizonte: 3i Editora, 2014).

7 I will use the abbreviated form "Belgo-Mineira" throughout the text.

reforms in the rest of the world. Until recently, studies of ARBED's global influence mostly dealt with the economic aspects of the company's expansion to Latin America, paying little attention to its social initiatives. Even though several researchers briefly mention the social initiatives created by ARBED in the Brazilian state of Minas Gerais, they do not generally make them the focus of their analysis, nor do they link them to the company's social initiatives in Luxembourg.[8] Moreover, research on Belgo-Mineira and its connection with ARBED is almost entirely the domain of Brazilian historians, architects, and engineers working and writing in Portuguese.[9]

This essay attempts to close some of the gaps in the research. Focusing on the social aspects of ARBED's expansion abroad, it argues that the Luxembourg and European social models were exported to Minas Gerais after the establishment of Belgo-Mineira. It aims to show the similarities between the social welfare ideas in the two countries and take a closer look at the means, methods, and motives used in the implementation of these ideas. To this end, this paper draws on two sets of primary sources: The first consists of twenty-five handwritten stories written by former Belgo-Mineira employees. These were gathered in 2007 as part of a "concurso de memória empresarial" (work memories contest) called "Foi assim" (That's how it was) organized by the archivists of the Centro de Memória da ArcelorMittal Brasil in Sabará.[10] In this

8 A possible exception is Fabio José Martins de Lima's doctoral dissertation from 2003, which discusses the architectural innovations and urban planning of the industrial cities created by Luxembourgers in Minas Gerais while also showing examples of ARBED's industrial villages in Luxembourg; see Fabio José Martins de Lima, "Por uma cidade moderna: Ideários de urbanismo em jogo no concurso para Monlevade e a realização da nova cidade operária (1931–1943)" (PhD diss., University of São Paulo, 2003).

9 See, for example, Osias Ribeiro Neves and Marina Mesquita Camisasca, *Aço Brasil: uma viagem pela indústria do aço* (Belo Horizonte: Escritório de Histórias, 2013); Telma de Barros Correia, *Modernismo e o núcleo fabril: O Anteprojeto de Lucio Costa para Monlevade* (paper presented at the VI Seminário de História da Cidade e do Urbanismo, Natal, Brazil, 2000); Gustavo Barros, "O desenvolvimento do setor siderúrgico brasileiro entre 1900 e 1940: criação de empresas e evolução da capacidade produtiva," *Revista de Historia Econômica & Economia Regional Aplicada* 9, no. 14 (Jan–Jun 2013): 9–32; Fernanda Bueno, "Estruturas metálicas do inicio do período do industrialização em Minas Gerias: Decorrências e preservação" (master's thesis, Federal University of Ouro Preto, 2012); Carvalho de I. Menezes, "Louis Jacques Ensch: A presença do engenheiro luxemburguês em Sabara," *Revista do Instituto Histórico e Geográfico do Ciclo do Ouro* 1, no. 1 (December 2011): 72–77.

10 The Centro de Memória da ArcelorMittal Brasil in Sabará is a foundation and an archive dedicated to the preservation of the industrial past in the Minas Gerais region and started operating in 2000. The archive is rich in audio-visual and textual documents, but the existing documents are still uncatalogued, unlisted, and uncoded. This is why I refer to these documents by title only (for example, *O Pioneiro* or "Foi assim").

competition, correspondents were asked to write an essay about their experience working for Belgo-Mineira. The second set of sources is taken from Belgo-Mineira's magazine *O Pioneiro*, published twice a month between 1954 and 1965. In each issue, one or several workers are presented textually and visually in a section dedicated to the "*Velha Guarda*"—Belgo-Mineira's "old guard." Taking into consideration that these sources are representing the image that the company wanted to project to the world, it is necessary to adopt a critical approach. Hence, my analysis takes as its critical standpoint Foucault's concept of the "technologies of power." Simply put, Foucault sees power as ways of making people behave in a certain way, which, as we will see, was central to the creation of Belgo-Mineira's obedient workforce.[11]

In an attempt to unveil the circumstances that led to the establishment of business connections between Luxembourg and Brazil and to analyze the impact of these connections, this paper unfolds in three parts. The first part briefly discusses the creation of ARBED and its social reforms in Luxembourg. In the second part, I will describe the context in which Belgo-Mineira was created in Brazil and the attempts of the company's director, Louis Jacques Ensch, to develop both the mining industry and a variety of social initiatives in Brazil. The third and final part emphasizes the importance of workers' education through social initiatives and takes a closer look at the creation of emotions such as fear, pride, and belonging as strategies to control and discipline the workforce. The paper closes with a discussion of the company's extensive intervention into the workers' private lives and of the implications of this intervention.

2 ARBED's Social Initiatives in Luxembourg

In order to talk about and understand ARBED's significance, it is necessary to look at the company's visionary and liberal founding family, the Mayrischs. It was the Mayrischs who pioneered the social initiatives that not only changed the lives of the people who worked for the company but greatly influenced the lives of the entire population of Luxembourg.[12] Due to their social engagement, ARBED's founding director Emile Mayrisch (1862–1928), his wife Aline Mayrisch de Saint-Hubert (1874–1947), and their daughter Andrée Viénot (1901–1976)

11 Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972–1977*, trans. Colin Gordon (New York: Pantheon, 1980).

12 The Mayrischs' social initiatives are described in ARBED, *Œuvres sociales* (Luxembourg: Victor Bück, 1922), a promotional booklet published by the company.

became the most influential, respected, and mythologized Luxembourgers. This mythologization was probably strengthened by the Mayrischs' close connections to the leading political and literary circles in Europe and beyond. Besides intellectual exchanges with the elites of the time, which often took place at their Colpach Castle in Luxembourg, the Mayrischs were also eager travelers, which meant that their ideas of social welfare were also informed by intellectual trends and tendencies abroad.[13]

While the main focus of this chapter is on how the Mayrischs' approach of generating economic gain through social initiatives was applied in Brazil, it is necessary first to briefly describe some of their social initiatives in Luxembourg in order to understand the similarities between the social welfare ideas in the two countries. Probably the most visible initiatives were those that involved the betterment of housing conditions. Before ARBED's involvement, much of Luxembourg's population lived in dwellings that "resembled a barn rather than a human habitation," as Aline Mayrisch wrote in a 1907 report on living conditions in Luxembourg.[14] To improve the living and health conditions of its workers, ARBED built the so-called "*cités ouvrières*" (workers' housing estates) in the southern part of Luxembourg.[15] These were available to workers for a very modest rent. Modeled on the German company Krupp's industrial city,[16] and reflecting the hierarchical structure of the company

13 See, for example, Karin Priem and Geert Thyssen, "Fragmented Utopia: Luxembourgian Industrialists, Intellectual Networks and Social-Educational Reforms between Tradition and Avant-Garde," *Jahrbuch für Historische Bildungsforschung* 19 (2013): 106–26; Robert Stumper, *Colpach* (Luxembourg: Amis de Colpach, 1957); Robert Stumper, *Colpach*, 2nd, rev. and exp. ed. (Luxembourg: Amis de Colpach, 1978); Germaine Goetzinger, *Aline Mayrisch: Féministe engagée, philanthrope éclairée, femme de lettres éminente* (Metz: n.p., 2014); Klaus Dittrich, "Buddhism, Business, and Red-Cross Diplomacy: Aline Mayrisch de Saint-Hubert's Journeys to East Asia in the Interwar Period" (in this volume). For more information on the correlation between capitalism and intellectual networks, see Geert Thyssen and Karin Priem, "Brains, Money and Power in Education: Industrial-Intellectual 'Avant-Gardes' and Their 'Social Works'" (unpublished conference paper, International Standing Conference for the History of Education [ISCHE] 35, Riga, Latvia, August 21–24, 2013).

14 Société luxembourgeoise d'hygiène sociale et scolaire, *Einiges über Wohnungsverhältnisse der ärmeren Arbeiterbevölkerung in Luxemburg* (Luxembourg: M. Huss, 1907), 12.

15 See Antoinette Lorang, *L'image sociale de l'Arbed à travers les collections du Fonds de logement* (Luxembourg: Le fonds pour le développement du logement et de l'habitat, 2009), 38.

16 Ibid., 9. For more information on industrialization in Germany and the Krupp conglomerates, see Walter Buschmann, *Zwischen Rhein-Ruhr und Maas: Pionierland der Industrialisierung – Werkstatt der Industriekultur* (Essen: Klartext, 2013); Lothar Gall, *Krupp: Der Aufstieg eines Industrieimperiums* (Berlin: Siedler, 2000).

(the higher the rank, the bigger and better the house), these housing solutions also served to increase workers' loyalty to the company.[17]

Health initiatives were another means of gaining workers' loyalty. The health of their workers and their workers' children was of particular concern to the Mayrischs. For them, it was a logical move to attend also to the children who would become the future working elite.[18] Shortly after ARBED's establishment, the company began to initiate many health initiatives for children, especially those suffering from tuberculosis—including open air schools, preventoriums, holiday camps, milk distribution stations, and scouts troops. These initiatives were characterized by strict rules and schedules and thus focused on disciplining and controlling "sick and weak" children.[19] The health of children and adults was also promoted through the activities of the Ligue luxembourgeoise contre la tuberculose (Luxembourg Anti-Tuberculosis League), its sanatoriums, visiting nurses, and dispensaries.[20] Aline Mayrisch deserves the biggest credit for these health initiatives. Attention to physical education was also a major part of the curriculum of vocational schools. The best-known of these schools was the Institut Emile Metz, featuring, among other things, a scouts troop and a gym club to further the "moral and physical development of the working class."[21] In short, ARBED's directors did not hesitate to invest in the

17 Lorang, *L'image sociale de l'Arbed,* 30–34. See also Antoinette Lorang, "Les logements ouvriers: une cité modèle à Dudelange/A Model Workers' Housing Estate in Dudelange," in *La sidérurgie luxembourgeoise: Un siècle d'histoire et d'innovation/Steelmaking in Luxembourg: A Century of History and Innovation*, ed. ArcelorMittal (Luxembourg: ArcelorMittal, 2011), 153–55.

18 Frederik Herman, "Forging Harmony in the Social Organism: Industry and the Power of Psychometric Techniques," *History of Education* 43, no. 5 (2014): 611.

19 For more information on ARBED's open-air schools, see Geert Thyssen, "Engineered Communities? Industry, Open-Air Schools, and Imaginaries of Belonging (c. 1913–1963)," *History of Education & Children's Literature* 10, no. 2 (2015): 297–320; Geert Thyssen, "The Open-Air Schools of Dudelange and Esch-sur-Alzette," *Forum für Politik, Gesellschaft und Kultur* 301 (2010): 40–42; Irma Hadzalic, "Sick and Weak but Made of Steel: Luxembourgian Open-Air Schools and Other Responses to the Spread of Tuberculosis at the Beginning of the 20th Century," *Revista de História e Historiografia da Educação* 1, no. 1 (2017): 44–64.

20 The fight against tuberculosis in Luxembourg is comprehensively described in Enric Novella, "Germs, Bodies, and Selves: Tuberculosis, Social Government, and the Promotion of Health-Conscious Behavior in the Early Twentieth Century" (in this volume).

21 "Historique," Lycée Technique Privé Emile Metz, http://www.ltpem.lu/php_links/historique.php. The history of the institute is nicely described by Françoise Poos, see "Photography as Space for Constructing Subjectivities: Luxembourg's Steel Dynasties and the Modern Workforce as Seen through the Glass Plate Negatives from the Institut Emile Metz" (in this volume). For more information on the Institut Emile Metz and an examination of the psychometric techniques developed for vocational orientation, see Herman, "Forging Harmony in the Social Organism."

health of their workers and in the education and training of their workers' children to create a productive and skilled workforce for the manufacture of high-quality products.[22]

ARBED's social engagements were not exclusively altruistic or philanthropic, however. On the surface, they served to "elevate workers' moral and intellectual level," but in practice the Mayrischs understood that improving the miners' living and working conditions would also improve their productivity.[23] ARBED used its social initiatives to educate its workers and to teach them loyalty to the company, ultimately assuring the company's economic profit.[24] ARBED's leaders took pride in and widely publicized their housing, health, education, and other social initiatives through, at the time, innovative tools and media, such as photography and film.[25] A lot of research has shown that ARBED was fully engaged in every sphere of life in Luxembourg.[26] Employing more than half of Luxembourg's population and investing heavily in social improvements, ARBED became the most important company in the country, from its establishment in 1911 until the world economic crisis in the 1970s.

Even so, the company's path towards economic and social prosperity was not always smooth. In fact, it was moments of crisis and stagnation during and after the First World War that made possible ARBED's expansion and sealed the ties between Luxembourg and Brazil. Right after its occupation by Germany in World War I, Luxembourg in 1919 withdrew from the German Customs

22 See Jean Marx, "L'ARBED, un pionnier de la formation professionnelle au Luxembourg/ ARBED, a Pioneer of Professional Training in Luxembourg," in ArcelorMittal, *La sidérurgie luxembourgeoise*, 161–63.

23 Andrée Mayrisch, cited in Nadine Schmitz, "Le paternalisme d'Émile Mayrisch," in *Terres rouges: Histoire de la sidérurgie luxembourgeoise*, vol. 3, ed. Charles Barthel and Josée Kirps (Luxembourg: Centre d'études et de recherches européennes Robert Schuman/Archives nationales de Luxembourg, 2011), 104–5. Conducting a social survey at ARBED in 1928, entitled *Plan de développement pour les oeuvres sociales d'Arbed–Terres Rouges*, Andrée Mayrisch, Emile Mayrisch's daughter who worked in the company's central administration, concluded that the workers' well-being depended first and foremost on their salary. Because a rise in salary was not possible, Andrée suggested social works as one alternative to improve workers' well-being.

24 Nadine Schmitz, "La politique sociale de l'ARBED/ARBED's Social Policy," in ArcelorMittal, *La sidérurgie luxembourgeoise*, 149–51.

25 In this context, Herman and Plein talk about "new technologies of display" serving as educational tools. See Frederik Herman and Ira Plein, "Envisioning the Industrial Present: Pathways of Cultural Learning in Luxembourg (1880s–1920s)," *Paedagogica Historica* 53, no. 3 (2017): 268–84.

26 See, e.g., Charles Barthel and Josée Kirps, eds., *Terres Rouges: Histoire de la sidérurgie luxembourgeoise*, 6 vols. (Luxembourg: Centre d'études et de recherches européennes Robert Schuman/Archives nationales de Luxembourg, 2009–2018).

Union and in 1921 entered into an economic union with Belgium. Following these changes and disruptions, ARBED desperately looked for new mining sources and export markets.[27] At the same time, Brazil, too, sought to modernize and expand its steel industry and welcomed ARBED with open arms. By expanding to Brazil, ARBED exported not only its steel producing expertise but also its social welfare ideas, adapting them to a new country and a new context.

3 Luxembourg-Brazilian Cooperation

The development of the steel industry was a major concern for Brazilian government representatives, such as President Epitácio Pessoa (1865–1942), "the forceful patron of industrialization," and his successor Arthur Bernardes (1875–1955), who sought to boost national steel production by attracting foreign investors.[28] In 1920, the Belgian King Albert I (1875–1934) traveled to Brazil, where he was welcomed by President Bernardes. The Brazilian president explained to the Belgian king that the Brazilian steel production industry was in desperate need of European investors.[29] Upon his return to Europe, King Albert I passed on this message to his economic advisor Gaston Barbanson (1876–1946) who was also one of ARBED's directors.[30] As mentioned above, Luxembourg's exit from the German Customs Union in 1919 had complicated ARBED's export plans, making expansion to Latin America a welcome and convenient proposition. The company leaders therefore did not waste time implementing this idea. Only a few months after King Albert I's return to Europe, Émile Mayrisch and Gaston Barbanson in 1920 formed the Syndicat de Brésil (Brazil Syndicate) to study the possibility of developing steel companies

27 At the same time, ARBED also expanded to Asia, notably to Japan. See Klaus Dittrich, "Selling Luxembourgian Steel in Japan: Columeta Tokyo, 1925 to 1941," *Zeitschrift für Unternehmensgeschichte* 61, no. 2 (2016): 215–36.

28 Eddy Stols, "Présences belges et luxembourgeoises dans la modernisation et l'industrialisation du Brésil (1830–1940)," in *Brasil: Cultures and Economies of Four Continents*, ed. Bart de Prins, Eddy Stols, and Johan Verberckmoes (Leuven: Uitgeverij Acco, 2011), 147.

29 By establishing their own companies in Brazil, European investors would help Brazilian officials to break the North American monopoly on steel production. President Bernardes strongly opposed the plans by U.S. businessman Percival Farquhar for the Itabira Iron Ore Company, which threatened to take over Brazilian steel production. See Moyen, *A história da Companhia Siderúrgica Belgo-Mineira*, 23.

30 Stols, "Présences belges et luxembourgeoises," 150–51.

and other businesses in Brazil and elsewhere in South America.[31] In 1921, ARBED merged with the already existing Companhia Siderúrgica Mineira to form the new Companhia Siderúrgica Belgo-Mineira, investing 15,000 conto into the new company, a significant investment comprising about 25 percent of the entire state revenue of Minas Gerais.[32]

If ARBED's creation in 1911 marked a milestone in the history of modern Luxembourg, the creation of the Companhia Siderúrgica Belgo-Mineira in Minas Gerais a decade later definitely changed the course of the Brazilian history of steel production.[33] However, the first six years of the Luxembourg-Brazilian cooperation gave much cause for concern and led ARBED to question its initial enthusiasm. With no export plans and no marketing strategies in place, the newly established Belgo-Mineira ran a constant deficit. Therefore, the young engineer Louis Jacques Ensch was sent on a mission in 1927.[34]

Before embarking on his Brazilian adventure, Ensch lived and worked in Luxembourg's industrial south. His entire life, education, and career were connected to ARBED and steel production. An optimistic, dynamic, and knowledgeable engineer, Ensch became production manager of ARBED at the age of 25.[35] Working hand in hand with ARBED's directors, he observed their leadership skills and their preoccupation with their workers' well-being and dreamed of becoming one of these great industrialists.[36] An adventurous person, he did not hesitate to jump at the opportunity to be a new pioneer, even if this opportunity took him far away from home.[37] In October 1927, ARBED thus sent its most highly skilled engineer to Brazil. As chief engineer, Ensch was put in

31 Minas Gerais was, at the time, the second most powerful state in Brazil in economic terms. See Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 34.

32 See also Ribeiro, *Learning from Minas Gerais*, 95–100. Minas Gerais' state revenue was 60 million escudos, with 1,000 escudos equalling 1 conto; see Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 35.

33 Gilbert Trausch, *L'ARBED dans la société luxembourgeoise* (Luxembourg: Imprimerie de la Cour Victor Buck, 2000), 9.

34 Moyen claims that Ensch was sent to cancel ARBED's deal with Brazil; see Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 47. But no documentation has yet been found to support this claim.

35 See Polanczyk, *Louis Ensch e a Belgo-Mineira*; Joseph Petit, *Un grand Luxembourgeois: Louis Ensch* (Luxembourg: Impr. P. Linden, 1953).

36 Ensch's personality is nicely described in a historical novel; see Marc André Meyers, *D'amour et d'acier: Quand le Luxembourg et le Brésil forgeaient l'histoire* (Luxembourg: Ed. Saint-Paul, 2015).

37 See Édio Vieira de Azevedo, *Relances da Belgo-Mineira* (Belo Horizonte: MG—SEGRAC, 2004), 23.

charge of Belgo-Mineira's administrative and manufacturing services. Already in 1929, he became one of the company's directors and from 1936 until his death in 1953, he held the position of the company's general director.[38]

Upon his arrival in the Brazilian city of Sabará, Ensch witnessed first-hand the problems the company was facing, including unqualified staff, stagnating steel production, and the accumulated stocks of steel products. Sabará, however, enjoyed a good geographical location, close to the sources of coal. According to ARBED's original plan, the Sabará plant was meant to be an experimental phase only, a sort of staff training ground until a bigger and more modern plant could be built in the city of João Monlevade, some sixty miles further east. The construction of the João Monlevade plant depended on a planned railroad that would connect Minas Gerais to the capital and the ports and thus be key for the "stimulation of the [region's] industrial development."[39] Unfortunately, with the political unrest taking place during the regime of President Getúlio Vargas, whose government had promised to build the much-needed railroad, Belgo-Mineira's plan of expansion to João Monlevade had to be postponed.[40] Ensch, however, was convinced that the company would thrive by applying Luxembourgian ideas of industrial growth. In order to succeed, he considered it indispensable to deliver a high-quality product, which could only be produced by well-trained workers. Ensch thus had to, first, create training and social facilities for the workers and, second, establish mutually beneficial and meaningful relationships with the Brazilian elites who were interested in the development of the national steel industry. [41] He knew that steel products were in high demand during that period in Brazilian history which came to be called the "Era Dourada"—the Brazilian Belle Époque that was characterized by technological developments and major societal and cultural changes. All he had

38 Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 192–93.

39 Ribeiro, *Learning from Minas Gerais*, 93.

40 Getúlio Vargas was a strong proponent of industrialization in Brazil. From 1937 until 1945, he instituted the corporatist regime known as "Estado Novo" (New State), the dictatorial period in Brazilian history that resulted in many unrests and changes. See Robert M. Levine, *Father of the Poor? Vargas and His Era* (Cambridge: Cambridge University Press, 1998). For a more critical view of Vargas and his populist ideas, see Joel Wolfe, "'Father of the Poor' or 'Mother of the Rich'? Getúlio Vargas, Industrial Workers, and Construction of Class, Gender, and Populism in Sao Paulo, 1930–1954," *Radical History Review* 58 (1994): 80–111.

41 Ensch also had close relationships with European and North American industrialists, ambassadors, and politicians. See the folder entitled "Correspondence avec Louis J. Ensch 1941–1954," AE-AW-0040, Archives nationales de Luxembourg (ANLux).

to do was find a way to sell Belgo-Mineira's products nationwide and to convince potential clients of their superior quality.[42]

During the first ten years of his directorship, Ensch turned the city of Sabará into a prosperous steel-producing environment, and the company finally started to make significant profits. Radically modifying the company's administrative system, Ensch managed to expand the plant, sell its products on the national market and even export them outside Brazil. In the early 1930s, Ensch also became friends with President Getúlio Vargas, who had similar ideas about industrialization and corporate management. Ensch was a savvy businessman, and his "powers of persuasion and his skills at arguing" ultimately contributed to the success of Belgo-Mineira, especially of its João Monlevade plant.[43]

4 Education, Emotion, and the Making of a Productive Labor Force

Already in Sabará, Ensch launched a variety of social initiatives—he ordered the construction of workers' houses and health facilities and provided on-site worker training—but it seems that Sabará served primarily as a training ground not only for his workers but also for himself.[44] One of Ensch's biggest problems was "controlling" his workforce and making sure that his workers showed up for work. As one historian has pointed out, given the "lack of industrial mentality, the workers would fail to show up during the dry season, preferring to dedicate their time to the harvest."[45] There were no proper living, health, educational, and leisure facilities—that is, no infrastructure that would keep the workers at the factory and at work, even though the company offered rewards for their productivity and attendance.[46] So, Ensch's first challenge in Sabará was to generate an "industrial spirit" in order to overcome the workers' "passive resistance" and keep them at work.[47] He would do so by using his

42 One of the difficulties for Belgo-Mineira was the population's lack of trust in national products. Brazilians were used to imported products. Public opinion changed when a well-known major newspaper, *A Noite*, used Belgo-Mineira's materials to build its new headquarters in Rio de Janeiro in 1937; see Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 50.

43 "Louis Ensch," *Atualidades do Vale do Piracicaba. Orgâo da Associaçâo Monlevade de Serviços Sociais* 150 (1971): 48.

44 See also Chômé, *Un demi-siècle*, 84.

45 Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 59.

46 Ibid.

47 Foucault, *Power/Knowledge*, 163.

personal involvement and meritocratic approaches as strategies of power and discipline.[48]

Due to Ensch's "philanthrocapitalism," Belgo-Mineira eventually became the biggest steel producer in Latin America.[49] August 31, 1935, the day when the cornerstone was laid for the João Monlevade plant in the presence of President Getúlio Vargas, marked the beginning of a new phase in the history of steel production in Brazil.[50] That same day, Vargas also inaugurated the long-awaited railroad. The railroad made it possible to import the materials needed for the construction of the industrial city of João Monlevade as well as to export Belgo-Mineira's products, connecting the newly constructed industrial area to the rest of the region and the world. As Félix Chômé, chairman of the board of directors of ARBED from 1952 until 1961, would emphasize later,

> His [Ensch's] greatest work remains the creation of the Monlevade plant … He created … a modern steel assembly that can be regarded as a model and as the starting point of the growth of the steel industry in Brazil. Those like me who have had the privilege of visiting Monlevade, its plant, its houses, its hospital, its schools, the entire remarkable ensemble, were seized with admiration for the great work accomplished.[51]

João Monlevade was thus the prototype for Brazil's modern steel production. The transformation of the area into a successful steel producing environment happened rather rapidly. Before Ensch's arrival, the area was uninhabited and devoid of any infrastructure. Within a seven-year period, from 1937 until 1944, Belgo-Mineira built four blast furnaces (one of them was named after Getúlio

48 Ibid.

49 A term coined by Matthew Bishop and Michael Green in 2008, "philanthrocapitalism" refers to the combination of money, business skills, and business methods. The "philanthrocapitalists" are often personally involved in the projects they are financing. See Hugo Sintes, Review of *Philanthrocapitalism: How the Rich Can Save the World and Why We Should Let Them*, by Matthew Bishop and Michael Green, and *Just Another Emperor? The Myths and Realities of Philanthropic Capitalism*, by Michael Edwards, *Development in Practice* 19, no. 6 (2009): 812–15. Belgo-Mineira produced 60 percent of Brazilian steel as early as 1940, thus becoming the largest steel company in Latin America; see Stols, "Présences belges et luxembourgeoises," 154.

50 Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 51. The plant was named "Usina Barbanson" in honor of Gaston Barbanson, co-founder of ARBED and also one of the founders of Belgo-Mineira.

51 *A Memória de Louis Jacques Ensch* (Belo Horizonte: Establecimentos Graficos Santa Maria, 1953), 63–64.

Vargas) and spawned an entire city that was eventually described as a "dream come true and an utopia become apotheosis."[52] João Monlevade became the first planned city in Brazil, most probably modeled on Krupp's workers' settlement in Essen, Germany.[53] As mentioned before, Krupp's company housing also served as the model for workers' housing in Luxembourg. Hence, Ensch could draw on existing models and traditions, while organizing and designing the city according to his own plans. Ensch hired well-known architects and engineers, such as Yaro Burian and Lincoln Continentino, to design his utopian industrial city, but the execution of the construction works was his responsibility.[54] The idea of a city that would "exude the joy of living and the contentment of its inhabitants, giving a clear and cheerful impression" testifies to Ensch's utopian vision of creating a peaceful, contented, and productive industrial community.[55] The entire city of João Monlevade became an extension of the company, remaining under the private ownership of the company's leaders until the mid-1960s.

By 1953, around 2,500 houses for the company's employees had been built in the vicinity of the plant and given to workers for free, but under strict rules of maintenance controlled by Ensch personally. He regularly inspected the hygienic conditions of the workers' houses, and if the house was not up to his, Ensch's, standards of cleanliness, the house would be taken away from the worker with the remark that "knowing how to live in a house is a way of education."[56]

52 Edmundo da Luz Pinto, at the 25th anniversary celebrations of Louis Ensch's administration, cited in *Companhia Siderurgica Belgo Mineira* (Rio de Janeiro: Graficos Bloch, 1953), n.p.

53 Aerial photographs of both cities show major similarities, and while oral histories suggest that Ensch used Essen as a model for his city, we do not yet have any documented confirmation. On Krupp's workers' settlements, see Cedric Bolz, "Constructing Heimat in the Ruhr Valley: Assessing the Historical Significance of Krupp Company Housing from Its Origins through the National Socialist Era, 1855–1941" (PhD diss., University of Victoria, 2003). Nevertheless, industrial cities were not a novelty at the time. Throughout the nineteenth and twentieth centuries, many industrial cities developed around the world, for example, Pullman in Chicago and New Lanark near Glasgow. See John Minnery, "Model Industrial Settlements and Their Continuing Governance," *Planning Perspectives* 27, no. 2 (April 2012): 309–21; Robert Lewis, "Networks and the Industrial Metropolis: Chicago's Calumet District, 1870–1940," in *Industrial Cities: History and Future*, ed. Clemens Zimmermann (Frankfurt: Campus Verlag, 2013), 89–114.

54 For more information on Yaro Burian, see Polanczyk, *Louis Ensch e a Belgo-Mineira,* 136. Lincoln Continentino's project is described in Fabio Jose Martins de Lima, "Urbanismo em Minas Gerais: Olhares de engenheiros, arquitetos, geógrafos e outros planejadores (1930–1980)," *URBANA, Dossiê: Urbanistas e Urbanismo* 5, no. 6 (March 2013): 148–69.

55 Lima, *Por uma cidade moderna*, 98.

56 Édio Vieira Azevedo, interview by Isabella Menezes, Belo Horizonte, MG, Brazil, September 2002, transcript, Centro de Memória da ArcelorMittal Brasil, Sabará. Azevedo, head

Through his personal and explicit involvement, Ensch not only wanted to educate the workers about hygienic principles but also instill in them a fear of deprivation, which would teach them to be docile, obedient, and respectful. Through his "inspecting gaze," Ensch could use this fear of deprivation as a "continuous technology of power" to control and discipline his workers.[57] By intruding into the workers' private lives and telling them how they should live, the company used its housing initiatives as educational tools.[58] The "educationalization" of workers' living spaces thus became another technology of power—a means of adapting a disciplined, obedient, and productive workforce to the needs of a modern steel company.[59] Moreover, the location and size of the houses reproduced the corporate hierarchy, mirroring the skill level and social status of the workers—just as in Luxembourg.[60] It is interesting to note that while Belgo-Mineira's workers came from a wide variety of national and racial backgrounds (see fig. 7.1), any form of discrimination that occurred was on the basis of workers' professional skills and abilities.[61] Most of the skilled labor, however, was done by Europeans, which meant that Europeans also had better housing.

Whereas the Brazilian workers were considered to be 'simple' men without education and experience, the foreigners were the 'skilled' workers able to teach the local workforce.[62]

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of electrical maintenance at Belgo-Mineira in the late 1940s, describes Ensch's personal and authoritarian involvement in the social initiatives and how he went inspecting the "*cafuas*," the workers' houses. Ensch's visits to the workers' houses are described more mildly in Azevedo, *Relances da Belgo-Mineira*, 85.

57 Foucault, *Power/Knowledge*, 146–65.

58 The company also paid for the furniture and eventual repairs, which were recorded in detail. See Ronaldo André Rodrigues da Silva, "Empresa, cidade e sociedade: Uma (re) construção das relações sociais sob o olhar das vilas operárias," in *Anais do i encontro em patrimônio industrial* (Campinas: UNICAMP, 2004), n.p.

59 The term "educationalization" was coined by Marc Depaepe and Paul Smeyers; see their "Educationalization as an Ongoing Modernization Process," *Educational Theory* 58 (2008): 379–89.

60 Fabio José Martins de Lima, "Por uma cidade moderna: Ideários de urbanismo em jogo no concurso para Monlevade e a realização da nova cidade operária (1934–1960)," in *Simposio A organização do territorio pelo capital, o caso das vilas e núcleos gerados por empresas, São Paulo*, vol. 1 (Rio de Janeiro: Fundação Biblioteca Nacional, 2004), n.p. See also Rodrigues da Silva, "Empresa, cidade e sociedade."

61 Between 1920 and 2005, Belgo-Mineira employed 156 foreigners from 12 different countries, with Luxembourgers representing the majority of foreign workers. See Polanczyk, *Louis Ensch e a Belgo-Mineira*, 101.

62 Ibid., 100; Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 58.

FIGURE 7.1 Rolling mill operators, Belgo Mineira, Sabará, Brazil, December 23, 1930. © PHOTOGRAPH BY IGINO BONFIOLI, BELO HORIZONTE. CENTRO DE MEMÓRIA DA ARCELORMITTAL BRASIL, SABARÁ.

Since the success of Belgo-Mineira depended on high-quality products that could be produced only by skilled workers, the transformation from 'simple' to skilled and educated men was to occur under Ensch's surveillance at Belgo-Mineira, or what he called "The Steel University of Brazil."[63] Ensch and his colleagues, the highly qualified and well-behaved Luxembourgers, served as role models for the rest of the workers, as François Moyen, a former director of Belgo-Mineira, emphasized in an interview he gave in 2010: "We were the school for the others. We communicated the Luxembourgian virtues: to be 'honest and well-behaved.' We were at the top. Our people have an enormous amount of merits. … At the time, we were unbeatable. We built schools, we were a role model in the social sector."[64]

63 This 'concept' of the steel company as a university has been often repeated. See, for example, "Traz a morte de Louis Ensch," *O Cruzeiro*, October 21, 1953, Centro de Memória da ArcelorMittal Brasil, Sabará; "Velha Guarda. Professor Francisco José Pinto de Souza," *O Pioneiro* 19 (1955), Centro de Memória da ArcelorMittal Brasil, Sabará.

64 "Der Mann, der Belgo Mineira prägte," *Tageblatt*, December 2, 2010, http://www.tageblatt.lu/wirtschaft/story/95847883.

These efforts to educate the workforce and transform simple men into skilled men—to make them "internalize the correct behavior," or to "normalize" individuals—also involved school education.[65] By 1953, João Monlevade boasted three elementary schools and one vocational school, attended by thousands of students. By 1961, 90 percent of the population of Joâo Monlevade was literate. Primary, secondary, and professional schools at the time counted around 5,000 students, a greater number than there were workers at the João Monlevade plant.[66] Special attention was given to vocational training at the Escola Profissional de Monlevade—or "The Work Academy," as it was called in *O Pioneiro*.[67] Based on the SENAI (Serviço Nacional de Aprendizagem Industrial, National Industrial Training Service) model of education created by the Brazilian government, this vocational school "focused on training as a vehicle for discipline, social control, and worker integration into the state-directed project for national development."[68] Indeed, this kind of training certainly benefited Ensch's ideas of creating a productive workforce. The company's investments in vocational schools made it possible to "adapt the training to the needs of industry, without government interference."[69] This way, the investment in vocational training as a "technology of power" and discipline met the demands of production. Along with mechanics, welding, design, and other practical, hands-on subjects, the students also learned discipline.[70]

With the housing and schooling projects in place, the only social initiatives still missing were in the field of health. Like the Mayrischs in Luxembourg, Ensch spent much effort and money to establish and promote health reform. In 1947, Ensch married Maria ("Ceci") Campos Coutinho (1910–1966), a Francophile Brazilian who helped him in his endeavors, especially in the health

65 Gary L. Anderson and Jaime Grinberg, "Educational Administration as a Disciplinary Practice: Appropriating Foucault's View of Power, Discourse, and Method," *Educational Administration Quarterly* 34, no. 3 (1998): 335.

66 "Afirmou o sr. Magalhaes Pinto, ao inaugurar o quarto escolar de Monlevade, construído pela Belgo Mineira," *Estado de Minas*, April 18, 1961, 3, Centro de Memória da ArcelorMittal Brasil, Sabará.

67 "Escola Profissional – Academia de Trabalho!," *O Pioneiro* 5 (1955), Centro de Memória da ArcelorMittal Brasil, Sabará. The school's pedagogical/educational rhetoric and associated practices are quite similar to the educational discourses and practices developed, from 1914 onwards, at the Institut Emile Metz, a progressive vocational school in Luxembourg. For more information about the Institut Emile Metz, see Herman, "Forging Harmony in the Social Organism."

68 Barbara Weinstein, "The Industrialists, the State, and the Issues of Worker Training and Social Services in Brazil, 1930–50," *The Hispanic American Historical Review* 70, no. 3 (1990): 392.

69 Ibid., 394.

70 See *Companhia Siderurgica Belgo Mineira*, n. p.

sector.[71] At the 25th anniversary celebration of Ensch's directorship, plans were presented in Sabará for the construction of the "Sanatorium Ceci," giving visibility to the social works of his wife.[72] In addition, Ensch built one of the most modern and best-equipped hospitals in Brazil, the Hospital Margarida, named after his mother. The company also built crèches, childcare stations, milk distribution and production centers, and dental clinics. Similar to the activities of the Luxembourg Anti-Tuberculosis League, these places also served as health education and prevention centers providing information on diseases such as malaria.

Belgo-Mineira also launched a number of social and sports clubs—including a fishing and hunting club, a successful football team, and sports and leisure clubs for women. The company had its own swimming pool and even built vacation houses for its workers. By tightening his control over the workers' personal behavior, including their leisure activities, Ensch was therefore able to transform his miners into more cultivated workers.[73] Participating in these social and sports clubs also created a feeling of pride among the workers. Having a healthy and strong athletic body meant being able to operate heavy machinery and to produce as much steel as possible. Those who produced more were also more highly valued in society. In fact, physical strength and health were often a precondition for becoming a member of the Belgo-Mineira workforce and of utmost importance to Ensch, who, as one former worker recalled, would handpick the workers himself: "Dr. Louis Ensch would come down from his residence to the plant and remove from the queue the candidates who were not old or fit enough to work. So I, a 12-year-old, was removed from the queue."[74]

Depending on their physical condition, many miners started working at Belgo-Mineira between the ages of 11 to 15, but most of them came into contact with the company at a much earlier age. As children, they regularly 'trespassed' to play on the plant's premises or to bring lunch to their fathers who were their role models. In almost all cases, several generations of a family worked for the company. Since Belgo-Mineira was so overwhelmingly involved in all spheres

71 For more information about Maria Coutinho, see Azevedo, *Relances da Belgo-Mineira*, 38.

72 The sanatorium, however, was never opened, most probably because of Ensch's sudden death in 1953. See *Companhia Siderurgica Belgo Mineira*, n.p.

73 John D. Rockefeller advocated similar activities in Colorado. See Robin C. Henry, "In Order to Form a More Perfect Worker: John D. Rockefeller Jr. and Reform in Post-Ludlow Southern Colorado," in *Making an American Workforce: The Rockefellers and the Legacy of Ludlow*, ed. Fawn-Amber Montoya (Boulder: University of Colorado Press, 2014), 85.

74 "Concurso de memória empresarial 'Foi assim,'" F.V. 0001, Centro de Memória da Arcelor-Mittal Brasil, Sabará.

of the workers' lives, it was natural that already the very young dreamed of becoming a part of it: "As we walked home [from the plant] … our hearts were filled with the dream of one day belonging to that production system! It was at this epoch that the steel men were forged, men that made this company a world leader in steel production. And the dream came true."[75]

In a relatively short period of time, Ensch not only managed to create an "industrial mentality"; he and his company actually achieved much more: the workers' complete identification with the company. The attachment to the company was so overwhelming that some of the workers did not like to have days off, waiting impatiently to go back to work.[76] The feeling of belonging to the company gradually became so strong that one often comes across statements such as "I live from work and for work," "I was born to work," or "I intend to leave this company only when I die."[77] Some even referred to the company as "Mãe Belgo" (Mother Belgo).[78] From fostering dreams of becoming a part of (children of) Belgo to offering practical work that would help make these dreams come true, Ensch and his company thus were able to develop a "workers' personality" characterized by discipline and humility, high moral and intellectual values, obedience, and pride in being a workman and ultimately an exemplary citizen.[79] One worker recalled:

> I was born in 1921 … I grew up with the dream of becoming a "worker" and participating in building a better Brazil. … To be a citizen and to exercise my citizenship, while being a resident of a [workers'] village, I dreamed of having work that would support me and my family. … Through my work I was able to achieve my dreams, I raised a family, I was able to buy

75 "Concurso de memória empresarial 'Foi assim,'" N.S.E.L. 0001, Centro de Memória da ArcelorMittal Brasil, Sabará.

76 The following statement is a good example: "I enjoy working. Thank God I am not working for the money; my work pays off because I like it. On vacation, I rest well the first two days and then I desperately want to go back to the plant." Cited in "Velha Guarda: Trabalho não me mete mêdo," *O Pioneiro* 16 (1955), Centro de Memória da ArcelorMittal Brasil, Sabará.

77 "Velha Guarda: Pintou tôdas as maáquinas e edifícios da Usina Siderúrgica," *O Pioneiro* 24 (1955); "Velha Guarda: Raimundo Caetano Silva: nasceu no dia do trabalho," *O Pioneiro* 25 (1955); "Velha Guarda: Só pretendo sair da Usina quando morrer," *O Pioneiro* 6 (1955), Centro de Memória da ArcelorMittal Brasil, Sabará.

78 "Concurso de memória empresarial 'Foi assim,'" E.P.A.V. 0001, Centro de Memória da ArcelorMittal Brasil, Sabará.

79 "Workers' personality" is the term used by Timo Luks; see Timo Luks, "Social Engineering, the Factory and Urban Environment: Cadbury/Bournville and Opel/Rüsselsheim (1878–1960)," in Zimmermann, *Industrial Cities*, 268.

> a home and educate my children. I lived with dignity and was proud to tell everyone that I was a part of Belgo Mineira.[80]

The educational and social initiatives that created disciplined and productive men thus served yet another purpose. Being part of a company that is "building a better Brazil," Belgo-Mineira also made its workers feel like proper citizens of their country.[81] The company's many private initiatives thus gradually contributed to the "construction of a new image of the industrialists as progressive and enlightened and ready to create an alliance with labor in the name of national development."[82]

5 Summary and Discussion

The steel company ARBED, created in 1911, was the main source of the Grand Duchy's economic and social prosperity. Its founding family, the Mayrischs, launched a series of social initiatives in the fields of housing, health, and education to improve the health and living conditions of their workers. These initiatives were not based solely on philanthropic motivations. Their goal was to build worker loyalty to the company and thus assure productivity and economic prosperity. However, ARBED's path to success was not always smooth, particularly when Luxembourg's exit from the German Customs Union after World War I made it more difficult to export steel produce. It was during these hard times that ARBED's idea of expanding to Latin America was born. In 1921, ARBED established a subsidiary company, the Companhia Siderúrgica Belgo-Mineira, in the city of Sabará in the Brazilian state of Minas Gerais. Along with its steel producing expertise, ARBED also exported its social welfare ideas that it considered the basis for economic profit. One man in particular, Louis Jacques Ensch, who was put in charge of the business in Brazil, took the role of social benefactor and adapted these ideas to the new context, trying to create an obedient and disciplined work force for his newly created steel empire in Minas Gerais.

80 "Concurso de memória empresarial 'Foi assim,'" J.P.F. 0001, Centro de Memória da ArcelorMittal Brasil, Sabará.

81 This was repeated over and over in local media reports on Belgo-Mineira's activities. See, for example, "Jubileu de Ouro da C.S.B.M," *Atualidades do Vale do Piracicaba: Orgão da Associação Monlevade de Serviços Sociais* 150 (December 11, 1972), Centro de Memória da ArcelorMittal Brasil, Sabará.

82 Weinstein, "The Industrialists, the State," 401.

Ensch's first and biggest task was to instill in his as yet unskilled workers an "industrial mentality" to keep them at work. Between 1930 and 1953, he launched a host of social initiatives, which included the construction of an entire industrial city, João Monlevade, from scratch. While these social initiatives definitely improved workers' lives and health, they also served to transform the workers from simple and uneducated people into skilled, obedient, and disciplined laborers. In order to advance and maintain a social model that guaranteed stability and to create an industrial mentality, Ensch used his social initiatives as educational tools.[83] From inspecting workers' houses to handpicking future workers to creating vocational schools that taught discipline along with practical work, Ensch's personal involvement in transforming simple miners or farmers into skilled steel workers remains a fascinating case study. As a result of Ensch's social reform initiatives, Belgo-Mineira penetrated every aspect of its workers' lives. Social initiatives and creating emotions such as fear, pride, and belonging served as "technologies of power" and modes of governing.

Among the obvious positive effects of these social initiatives was the fact that Minas Gerais became a highly literate and one of the richest Brazilian states during Ensch's era. At the same time, Ensch could realize his desire to become as great a pioneer as those he had learned from in Luxembourg, a "progressive and enlightened industrialist" glorified for his achievements.[84] He indeed managed to put Brazil on the world map of steel industries, create long-lasting political and economic ties between Brazil and Luxembourg, and provide a satisfying living environment for the people who were the basis of Belgo-Mineira's success. The impact of Belgo-Mineira on the national economy cannot be denied either. It therefore became natural for men who were a part of the company to feel like they were contributing to the development of their country. In this way, a private initiative contributed to the contemporary national discourse promoting the modernization of Brazil.

Still, in order to understand Belgo-Mineira's success, it is necessary to reflect on the processes of establishing this modern steel production company and to question what has been called the "Brazilian specificity of quiet absorption, slow fusion and even peaceful amortization of foreign influences and claims."[85] Although it is difficult to find any information that explicitly shows any resistance to Belgo-Mineira's ideas of social and economic welfare, one should not assume that there was no resistance at all. Before João Monlevade was fully operational in the late 1930s, Belgo-Mineira had difficulty getting its miners to show up for work. This was attributed to the "lack of industrial mentality" in

83 Rodrigues da Silva, "Empresa, cidade e sociedade."
84 Weinstein, "The Industrialists, the State," 401.
85 Stols, "Présences belges et luxembourgeoises," 160.

Sabará, where the company initially operated.[86] It might be argued, however, that it also testifies to the workers' "passive resistance" to the transformation of life and society that came with these new industrial developments.[87] With the construction of the industrial city of João Monlevade, however, the workers' attitudes towards their work place seem to have changed completely. Now, the workers no longer wanted to stay away from the plant; they "lived from work and for work" and were proud to be part of a company that contributed to the nation's economic development.[88] How did this transformation occur? I have tried to show in this essay that this transformation was linked to Ensch's personal involvement and his methods of discipline, meritocracy, and control, which he used as "technologies of power" and governance.

It is equally important, however, to mention that the image the company projected, or sought to project, created a glorifying discourse that eventually seems to have become the only reality for the inhabitants of Belgo-Mineira's industrial cities. Like ARBED in Luxembourg, Belgo-Mineira actively promoted a certain image. Its social initiatives were much photographed, often by famous photographers such as Igino Bonfioli.[89] They were also the subject of various promotional materials and films promoting the steel industry.[90] Moreover, Belgo-Mineira had its own biweekly magazine called *O Pioneiro*, which was mostly dedicated to the promotion of the company's philanthropic work and contributions to the national economy. The examples from *O Pioneiro* presented in this paper nicely document the positive attitudes of the company's workers and employees, but since the magazine was published by and for Belgo-Mineira, it is, of course, necessary to acknowledge its bias.[91] Moreover, the difficulty

86 Moyen, *A história da Companhia Siderúrgica Belgo-Mineira,* 59.

87 Foucault, *Power/Knowledge*, 163.

88 "Velha Guarda: Pintou tôdas as maáquinas e edifícios da Usina Siderúrgica," *O Pioneiro* 24 (1955).

89 Igino Bonfioli (1886–1965) was an Italian film producer, director, cinematographer, and photographer. Born in Verona, Italy, he migrated to Brazil when he was 11 years old. Bonfioli lived and worked in Minas Gerais most of his life and died in Belo Horizonte, MG, Brazil. One of his best-known films is *A Canção da Primavera* (1923). See Alexandre Pimenta Marques, "O registro inicial do documentário mineiro: Igino Bonfioli e Aristides Junqueira" (master's thesis, Escola de Belas Artes da UFMG, 2007).

90 For example, the book published on the occasion of the 25th anniversary celebration of Ensch's administration glorifies the initiatives both textually and visually. See *Companhia Siderúrgica Belgo Mineira*. Some of the films are available online; see, for example, "Qualidade da Educação em João Monlevade/Sabará na década de 40," https://www.youtube.com/watch?v=qgbg2wO5T4E&t=4s.

91 At the same time, we cannot fully discredit the workers' positive testimonies, since the information collected independently of the company's direct influence—such as the "Foi assim" essays written by former Belgo-Mineira employees many years later—by and large corroborate the ideas expressed in *O Pioneiro*.

to find evidence of workers' resistance also suggests that the company wanted to preserve the positive image only. We know, for example, that workers' protests occurred in João Monlevade around 1945, even though the city was always presented as a utopian city in which dreams come true.[92] It is, however, extremely difficult to find more detailed information about these protests. More research is needed to fill these gaps and to challenge the corporate narrative of the creation of a disciplined and contented workforce, while acknowledging the obvious benefits that industrialization brought to Minas Gerais.

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92 Moyen, *A história da Companhia Siderúrgica Belgo-Mineira*, 65.

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CHAPTER 8

Requiem for Gary: Cultivating Wasteland in and beyond the "Age of Steel"

Angelo Van Gorp

1 René Sand: Social Medicine

In 1918, the Belgian government commissioned the Belgian social hygienist and pioneer of social medicine René Sand to conduct a study of Taylorism, or, as Sand himself defined it, "the science of organizing," which was occupied with mechanical efficiency and related physiological, psychological, and social factors.[1] To this end, Sand visited factories, workshops, stores, insurance companies, public administrations, schools of various types and levels, museums, libraries, hospitals, social welfare institutions, and scientific, medical, labor, and employers' associations in both the United States and England. He also spoke to politicians, lawyers, judges, publishers, journalists, bankers, writers, and ordinary people. The key lesson Sand drew from his research was that even if an enterprise was well organized from a material point of view, its functioning would be precarious if the human factor was not taken into account. The quality, economy, and continuity of the production relied on the workers' health, assuring the *ability* to produce; general and vocational education, developing the *talent* to produce; and contentment, determining the *willingness* to produce. To Sand, it had become clear that industry was not simply about the art of *fabricating*. One had to adapt industry to men instead of the other way around. *Efficiency* does not go without *beneficiency*, he argued.[2]

1 René Sand, *Organisation industrielle, médecine sociale et éducation civique en Angleterre et aux États-Unis* (Brussels: Librairie Maurice Lamertin; Paris: Librairie J.-B. Baillière et fils, 1920), 5–17. On Sand's pioneering role in social medicine, see Michael Gard and Carolyn Pluim, *Schools and Public Health: Past, Present, Future* (Lanham, MD: Lexington Books, 2014), 19–23. In 1953, Sand was called "one of the most outstanding world leaders in public health"; see "René Sand [obituary]," *American Journal of Public Health* 43 (1953): 1476. Crucial to his international reputation was the volume *Vers la médecine sociale* (Paris: Baillière et fils, 1948), which was translated into English as *Advance to Social Medicine*, trans. Rita Bradshaw (New York: Staples Press, 1952).

2 Sand, *Organisation industrielle*, 26. Sand based his analysis on Ordway Tead, *Instincts in Industry: A Study of Working-Class Psychology* (Boston: Houghton Mifflin, 1918).

What Sand proposed and advocated for was a social medicine that would play a pivotal role in urban-industrial society. Social medicine was conceived of as an umbrella science that, depending on where the emphasis was placed, either studied the medical factor in social problems or the social factors in medical questions. In that regard, social medicine was inextricably bound to the so-called social question and related processes of medicalization and educationalization.[3] It was concerned with medical statistics and demography, referred to as the "photography of the nation" and the "cinematography of national life" respectively[4]; social hygiene and pathology; health issues at the workplace; genetics and eugenics; as well as social, criminal, and educational anthropology, including experimental pedagogy, pedology, and pedotechnics.[5] The latter is important for it not only demonstrates social medicine's ambition to replace pedology as the new holistic bio-psycho-social paradigm, it also reveals a continued interest in progressive education.[6] In this respect, two references stand out in Sand's works: his acknowledgement of the work of his contemporary Ovide Decroly; and, related to his visit to the United States, his discussion of the public education system in Gary, Indiana.

2 Ovide Decroly: Pedagogical Therapy

As physicians, Sand and Decroly both looked at social problems and at the role education could play in dealing with them from a medical point of view. Although Ovide Decroly is first and foremost remembered for his pioneering

3 On the concept of medicalization, see, e.g., Robert A. Nye, "The Evolution of the Concept of Medicalization in the Late Twentieth Century," *Journal of the History of the Behavioral Sciences* 39, no. 2 (2003): 115–29. On the concept of educationalization, see, e.g., Marc Depaepe, *Between Educationalization and Appropriation: Selected Writings on the History of Modern Educational Systems* (Leuven: Leuven University Press, 2012); Paul Smeyers and Marc Depaepe, eds., *Educational Research: The Educationalization of Social Problems* (Dordrecht: Springer, 2009).

4 René Sand, *L'économie humaine par la médecine sociale* (Paris: Les Éditions Rieder, 1934), 19. Unless otherwise indicated, all translations are the author's.

5 Sand, *Organisation industrielle*, 718–20. His other works, too, reflect this approach; see particularly *La santé de l'écolier* (Brussels: Maison nationale d'édition l'Églantine, 1923); *La Belgique sociale* [*Un inventaire et un plan d'action*] (Brussels: J. Lebègue, 1933); *L'économie humaine par la médecine sociale*; *un programme de la santé pour la Belgique* (Brussels: Office de Publicité, 1945).

6 Angelo Van Gorp, "From Special to New Education: The Biological, Psychological, and Sociological Foundations of Ovide Decroly's Educational Work (1871–1932)," *History of Education* 34, no. 2 (2005): 135–49.

role in new education, he was as much an adherent of the "cult of efficiency" as was Sand.[7] For Decroly, just like for Sand, urban-industrial society served as a major frame of reference. And like Sand, Decroly, too, visited the United States, in his case to meet with well-known American professors, John Dewey being one of them, and to learn more about the scientific study of the child, especially about applied psychology.[8] From that perspective, a parallel can be drawn between Sand's social-medical plea for a scientifically-based industry and Decroly's scientifically-based pedagogy, for in both approaches a desire to deeply understand the human factor went hand in hand with an attempt to increase efficiency.[9] I would even go so far as to argue that the Decrolyan educational reform, which its adherents hailed as another Copernican revolution, was part of a rationalization of childhood aiming at social hygiene. Observation, recording, measurement, and quantification had become key features in Decroly's scientific study of the child (pedology) and its translation into educational practice (pedotechnics).

Modern urban-industrial society was a society plagued by social ills and diseases—alcoholism, syphilis, and tuberculosis foremost among them.[10] In the alleys of the large cities, children would therefore run the risk of picking "the flowers of evil."[11] This applied in particular to the many poor and working-class children whose plight served as a metaphor for the destructive and pathogenic city. Decroly called those children "the future recruits for the army of the degenerate who probably would end up in jail."[12] Deviant behavior was a symptom of

7 Raymond E. Callahan, *Education and the Cult of Efficiency: A Study of the Social Forces that Have Shaped the Administration of the Public Schools* (Chicago: University of Chicago Press, 1970). Kliebard even refers to an "orgy of efficiency"; see Herbert M. Kliebard, *The Struggle for the American Curriculum 1893–1958*, 3rd ed. (New York: RoutledgeFalmer, 2004), 80.

8 On his study tour of the United States, Decroly was accompanied by Raymond Buyse, who recorded his impressions of the trip in a diary. See Marc Depaepe and Lieven D'hulst, eds., *An Educational Pilgrimage to the United States: Travel Diary of Raymond Buyse, 1922* (Leuven: Leuven University Press, 2011).

9 Sand, *Organisation industrielle*, 158.

10 Ovide Decroly, "Plaies sociales et remèdes," *Revue Contemporaine: Pour l'École* 1 (1904): 406–10.

11 Ovide Decroly, "Discours d'ouverture: V^{e} Congrès belge de Neurologie et de Psychiatrie (Mons 25–26 septembre 1909)," *Journal de Neurologie* 14, no. 21 (1909): 412; see also Ovide Decroly and Raymond Buyse, *Les applications américaines de la psychologie à l'organisation humaine et à l'éducation* (Brussels: Lamertin, 1923).

12 Ovide Decroly et al., "Questionnaire pour servir à la confection du dossier médico-pédagogique," *La Policlinique* 15, no. 15 (1906): 226; see also Ovide Decroly, "Prophylaxie et traitement de l'enfance anormale: Le rôle du médecin," *L'École Nationale* 9, no. 2 (1909): 4–5.

a sick society, and prisons "gnaw[ed] away at society like a cancer."[13] It was absolutely necessary for society to be cured, otherwise it would be "stricken with gangrene."[14] Education could absorb the potentially pernicious influences of the home environment and the alleys and assure the future of the human species. The existing schools therefore had to be transformed into schools that really prepared children for life, read: modern, urban-industrial society. The ultimate goal was a society freed from social ills and an ideal, peaceful, and prosperous life—in short, the new era many educational reformers longed for.

What was needed, Decroly argued, was a "pedagogical therapy."[15] Mental tests were applied in order to check the mental capacity of each child. These mental tests were to enable the homogenization of groups and the individualization of instruction. The real aim of these tests was to improve the pedagogical methods applied. A differential psychology had to correspond with an "individual pedagogy."[16] This necessitated, however, a radical shift from a collective to an individualized way of instruction that would be in accordance with the mental capacity of each individual child. The Decroly Method not only was essentially based on the child's main interests; it also ascribed an important role to educative games in the child's learning process. Many of those games were derived from mental tests and became the quintessence of the intensification, or Taylorization, of the three Rs with a view to improving their efficiency.[17] The ultimate goal was "to Taylorize instruction in order to valorize education."[18]

Conceived of as a "pedagogy of efficiency" aiming at the socialization of as many children as possible, the Decroly Method used mental tests in order to determine norms for each category of pupils, such as the normal, the "pedagogically and medically backward," and the more gifted child.[19] In this respect, the benchmark was not the normal, that is, the average (compare Quetelet's notion of "the average man"), but the level of perfectibility of each different category.[20] It therefore could be argued that Decroly's scientific work to a very large

13 [Ovide Decroly], *Dr. Ovide Decroly, 1871–1932. Toespraak gehouden te Ronse in 1904: Tekst van de onuitgegeven redevoering* (Ghent: Departement Onderwijs, [1904]), 23.

14 Ibid., 24.

15 Decroly and Buyse, *Les applications américaines*, 52.

16 Ibid., 41.

17 See Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley: University of California Press, 1992).

18 Decroly and Buyse, *Les applications américaines*, 56.

19 Ibid., 52.

20 See André Turmel, "Towards a Historical Sociology of Developmental Thinking: The Case of Generation," *Paedagogica Historica* 40, no. 4 (2004): 419–33.

extent corresponded with Sand's social-medical agenda.[21] Medicine, according to Sand, not only had to be *curative* and *preventive*, but also *constructive* and *perfective*.[22] Like the engineers who had made machines and procedures more effective in industry, hygienists would take care of the "human machine" in society. Modern urban-industrial society had entered the "era of psychology."[23]

3 Gary, Indiana: An Educational Wasteland

Had the Decroly Method materialized into a corresponding school building in the United States, it might have looked like the huge model schools in Gary, Indiana, based on John Dewey's ideas: the Emerson and Froebel schools. Like the Decroly School in Brussels, they attracted visitors from all over the world who wanted to catch "a glimpse of the future."[24] Given the striking similarities, it is very likely that Decroly's pencil sketch of the ideal school is based on Graham Romeyn Taylor's map showing the layout of Gary's Froebel school as it was reproduced in Sand's 1920 volume.[25] The school buildings were designed by William B. Ittner (1864–1936), who has been called "the most influential man

21 It equally could be argued that branding the Decroly Method as merely "bourgeois" is ignoring the subject in the "Decroly delta" or, to put it differently, the varied classes, ranks, types, and categories the converging and diverging constructions in Decroly's scientific works touched upon. It did not prevent Decroly, and particularly the Decrolyans, from being convinced that the Decroly School as a true avant-garde school had to target an elite whose role and importance was to guide the masses and to bring happiness to an urban-industrial society that itself created backwardness and abnormality. See Van Gorp, "From Special to New Education"; Angelo Van Gorp, Marc Depaepe, and Frank Simon, "Backing the Actor as Agent in Discipline Formation: An Example of the 'Secondary Disciplinarization' of the Educational Sciences, Based on the Networks of Ovide Decroly (1901–1931)," *Paedagogica Historica* 40, nos. 5–6 (2004), 591–616.

22 Sand, *L'économie humaine*, 244.

23 Ibid., 191.

24 William J. Reese, foreword to *Children of the Mill: Schooling and Society in Gary, Indiana, 1906–1960*, by Ronald D. Cohen (Bloomington: Indiana University Press, 1990), x.

25 Graham Romeyn Taylor, *Satellite Cities: A Study of Industrial Suburbs* (New York: Appleton, 1915), 222; Sand, *Organisation industrielle*, 755–56; Decroly's pencil sketch is reproduced in Frederik Herman et al., "Modern Architecture Meets New Education: Renaat Braem's Design and the Brussels Decroly School (1946)," *Belgisch Tijdschrift voor Nieuwste Geschiedenis/Revue Belge d'Histoire Contemporaine* 41, nos. 1–2 (2011): 135–66; see also Frederik Herman et al., "Auf den Spuren von Diskurs, Traum und Wirklichkeit der architektonischen Formgebung in Decrolys Ermitage," *Zeitschrift für Pädagogik* 57 (2011): 928–51.

in school architecture in the United States."[26] The E-shaped schools became Ittner's trademark and were perceived as the ideal school plants, "creations of unusual beauty and impressiveness."[27] The layout reflected Dewey's ideas of what a school had to look like in order to avoid waste and to secure an organic connection with social life.[28] The plant, in its physical aspect, was more than a mere collection of facilities, since the facilities "fit into one another according to a very comprehensive plan" and formed "organs of a genuine school life," reflecting a belief in educating "the whole child," physically, artistically, scientifically, manually, as well as intellectually.[29]

Gary's superintendent of schools, William Wirt, had the "advantage of having a virgin field in which to work."[30] One might also call it an educational wasteland. Essentially, the Gary Plan represented an effort to apply to an urban school system Dewey's idea of education as an "embryonic community life."[31] Emphasis was on the school as "a social clearinghouse for the neighborhood."[32] In Dewey's words: "Using the school plant as a social center is recognition of the need for social change and of the community's responsibility to help effect it."[33] The most distinctive feature of the Gary Plan was the so-called "work-study-play plan" or "platoon system," a way of doubling the capacity of the schools by taking advantage of the fact that when one group of pupils was using the auditoriums, shops, laboratories, and playgrounds, another group could make use of the classrooms.[34]

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26 Virginia E. McCormick, *Architecture in Ohio: From One-Room Schools and Carnegie Libraries to Community Education Villages* (Kent, OH: Kent State University Press, 2001).

27 Randolph S. Bourne, *The Gary Schools* (1916; Cambridge, MA: MIT Press, 1970), 23.

28 John Dewey, *The School and Society: Being Three Lectures* (Chicago: University of Chicago Press, 1899), 77–78, 89, 93–94; see also John Dewey, *Democracy and Education: An Introduction to the Philosophy of Education* (New York: Macmillan, 1916), 416.

29 Bourne, *The Gary Schools*, 14, 32.

30 Ibid., 10.

31 Lawrence A. Cremin, *The Transformation of the School: Progressivism in American Education 1876–1957* (New York: Vintage Books, 1961), 155. On the relation between Dewey and Wirt, see Malcolm Thorburn, "John Dewey, William Wirt and the Gary Schools Plan: A Centennial Reappraisal," *Journal of Educational Administration and History* 49, no. 2 (2017): 144–56. Thorburn argues that "[w]hile much has been made of Wirt being a 'disciple of Dewey' … the extent to which this is the case is not noticeably discernible from a review of the correspondence between the two men." He adds: "In fact, there is no evidence that the two men ever met in person (although it is possible that Wirt was tutored by Dewey when in class at the University of Chicago)"; ibid., 149.

32 John Dewey and Evelyn Dewey, *Schools of Tomorrow* (1915; New York: E. P. Dutton, 1962), 197.

33 Ibid., 227.

34 Arthur Zilversmit, *Changing Schools: Progressive Education Theory and Practice, 1930–1960* (Chicago: University of Chicago Press, 1993); see also the notion of "activity centers" as

As Sand's work underlines, the public education system in Gary, Indiana, is one of the most telling examples of progressive education in the United States.[35] It has been discussed extensively in American scholarship on educational history.[36] The Gary Plan is also the most comprehensive example of schools working with "a curriculum that is truly representative of the needs and conditions of a democratic society," as discussed by Dewey and his daughter Evelyn in *Schools of Tomorrow*, published in 1915.[37]

As Gary's history is inextricably bound up with both the heyday and the decline of the steel industry in the United States, the case of Gary can be seen as emblematic of the "age of steel." Indeed, soon after the U.S. Steel Company was established in 1901, the company became a billion-dollar industrial empire and urgently needed more capacity to maintain its share of the booming steel market. In 1906, it started acquiring land in Lake County, Indiana, along the southern shore of Lake Michigan almost thirty miles southeast of Chicago. A new steel town arose that was named for Elbert Henry Gary (1846–1927), the first chairman of the board of U.S. Steel. Gary became a symbol of urban-industrial America in the Progressive Era, and it is considered the largest attempt at urban genesis and town planning ever undertaken by American industry.[38] It was hailed as "a huge technical miracle" and the "New Industrial Utopia."[39] Gary's steelmaking facilities were to be not only the world's largest at the time, covering an area of a square mile, but also the most modern, using the latest methods and technology.[40] Because of its mushroom growth, Gary was called "America's Magic City of Steel."[41] In Dewey's words, "the town was made … at a stroke and ha[d] grown rapidly from a waste of sand dunes to a prosperous

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explained by Karin Priem and Frederik Herman in "'Sensuous Geographies' in the 'Age of Steel': Educating Future Workers' Bodies in Time and Space (1900–1940)" (in this volume). Bourne also referred to this departmentalization as the "rotation-of-crops" system, see Bourne, *The Gary Schools*, 64.

35 Sand, *Organisation industrielle*, 753–57.

36 See, e.g., Kliebard, *The Struggle for the American Curriculum*; Susan F. Semel and Alan R. Sadovnik, eds., *"Schools of Tomorrow, Schools of Today": What Happened to Progressive Education* (New York: Peter Lang, 1999); Zilversmit, *Changing Schools*; Cohen, *Children of the Mill*; Cremin, *The Transformation of the School*.

37 Dewey and Dewey, *Schools of Tomorrow*, 288.

38 Anthony Brook, "Gary, Indiana: Steeltown Extraordinary," *Journal of American Studies* 9, no. 1 (1975): 35.

39 Adeline Levine and Murray Levine, "Introduction to the New Edition: The Gary Schools, a Sociohistorical Study of the Process of Change," in Bourne, *The Gary Schools*, xxvii; S. Paul O'Hara, *Gary: The Most American of All American Cities* (Bloomington: Indiana University Press, 2011).

40 Brook, "Gary, Indiana."

41 O'Hara, *Gary*.

town."[42] While the sensuous geography of an industrial town has (inevitably?) been linked to the drabness of industrialism,[43] Gary quickly became home to thousands of "millhands" who had their own myriad ways of inhabiting, experiencing, and sensing the town.[44]

Soon after it was founded, Gary became a town of mostly Eastern and Southern European working-class immigrants.[45] It instantly developed a vibrant community life offering public transport, sports facilities, city parks, playgrounds, public libraries, saloons, theaters, churches, settlement houses, beaches, and much more. The explosive growth to 55,000 inhabitants by 1920 and 100,000 by 1930 nevertheless brought a host of social problems. In its early years, Gary combined the tough atmosphere of a "frontier boomtown" with the virtues and vices of the "instant city," as well as the "typical municipal evils of graft, franchise fights, saloon dominance, insufficient housing and health regulation, election frauds, and lack of social cohesion."[46] Offering the rare opportunity of planning a new city from scratch, backed by the financial and organizational resources of the huge industrial empire of U.S. Steel, Gary obviously represented an urban planner's dream. Alas, the dream quickly turned into a nightmare.[47] Its dramatic growth did not prevent Gary from becoming a typical American city, or, like the historian Paul O'Hara phrased it, even "the most American of all American cities."[48]

In order to avoid the urban tragedy of the model city of Pullman, Illinois, built in the 1880s, U.S. Steel, unlike the Pullman Company, did not aim to create a social utopia.[49] In fact, different from Pullman, where the company owned all housing and exercised paternalistic control over the morals and behavior of the workers and their families, U.S. Steel conceived of Gary as a mere center of production "guided by geography, not philanthropy."[50] The physical structure created, as it were, three Garys: a mill town in the north alongside

42 Dewey and Dewey, *Schools of Tomorrow*, 268; see also Bourne, *The Gary Schools*, 3–4; Cremin, *The Transformation of the School*, 154.

43 Andrew Hurley, "Challenging Corporate Polluters: Race, Class and Environmental Politics in Gary, Indiana, since 1945," *Indiana Magazine of History* 88 (1992): 273–302.

44 Warner Bloomberg, Jr., and Victor F. Hoffmann, Jr., "The Recession Hits Gary, Indiana: Smiling Through?," *Commentary* 26, no. 1 (1958): 16.

45 Neil Betten and Raymond A. Mohl, "The Evolution of Racism in an Industrial City, 1906–1940: A Case Study of Gary, Indiana," *The Journal of Negro History* 59, no. 1 (1974): 51–64.

46 Brook, "Gary, Indiana"; Zilversmit, *Changing Schools*, 57; Bourne, *The Gary Schools*, 3.

47 Brook, "Gary, Indiana," 43.

48 O'Hara, *Gary: The Most American of All American Cities*.

49 Ibid.; see also Stanley Buder, *Pullman: An Experiment in Industrial Order and Community Planning, 1880–1930* (New York: Oxford University Press, 1967).

50 O'Hara, *Gary: The Most American of All American Cities*, 44.

the lake; a model town in the center encompassing the business district called "the First Subdivision"; and an industrial periphery in the south called "the Patch." The first and the second were divided from each other by the Grand Calumet River, the second and the third by the Wabash railroad tracks. As a consequence, the social division within Gary was a geographical reality from the outset. While the First Subdivision was planned with generally good housing and sanitation and catered for business and professional people and skilled workers, the South Side developed rapidly and disorderly into an insanitary and overcrowded slum area with poor-quality housing for the unskilled immigrant workers. The concept of the model industrial city of Gary was "destroyed before it got off the ground."[51]

It was in this context that Wirt decided to counter what he called the "education that the child gets on the streets and alleys"—thus taking an approach that forms a striking parallel with Sand's and Decroly's social-hygienist agenda.[52] By removing the opportunity for wasted "street and alley time" and by placing the working-class immigrant child under "the helpful, constructive influence of the school throughout the day," Wirt hoped to develop "a full rounded character, as well as an efficient school product."[53] According to Dewey, "[h]ealth is as important from the social point of view as from the individual, so that attention to it is doubly necessary to a successful community."[54] What was needed, then, was "a reorganization of the ordinary schoolwork to meet the needs of this class of pupils [working-class children], so that they will wish to stay in school [instead of hanging around on the streets and alleys] for the value of what they are learning." The ideal was not "to use the schools as tools

51 Brook, "Gary, Indiana," 46.

52 William Albert Wirt, *Newer Ideals in Education: The Complete Use of the School Plant. An Address Delivered Before the Public Education Association in the New Century Drawing Room, January 30, 1912* (Philadelphia: Public Education Association, 1912), 4. Although Wirt had studied educational methods in Belgium, England, France, and Germany—see *Dictionary of American Biography* (1940), s.v. "Wirt, William Albert"—and Dewey influenced both Decroly and Wirt, there most probably is no direct link between them. With reference to the social question, social-hygienic interventions were inherent to modern urban-industrial society. On the influence of Dewey on Decroly, see Angelo Van Gorp, "Ovide Decroly: Warum sollten wir ihn erforschen?," *Zeitschrift für pädagogische Historiographie* 13, no. 1 (2007): 6–13; Angelo Van Gorp, *Tussen mythe en wetenschap: Ovide Decroly (1871–1932)* (Leuven: Acco, 2005), 237–48; Tom De Coster et al., "Dewey in Belgium: A Libation for Modernity? Coping with His Presence and Possible Influence," in *Inventing the Modern Self and John Dewey: Modernities and the Travelling of Pragmatism in Education*, ed. Tom Popkewitz (New York: Palgrave Macmillan, 2005), 85–109.

53 Wirt, *Newer Ideals in Education*, 14; see also Bourne, *The Gary Schools*, 38.

54 Dewey and Dewey, *Schools of Tomorrow*, 290.

of existing industrial systems" but "to use industry for the reorganization of the schools."[55]

In Gary, the pupils had the opportunity to learn the specific skills for different professions: "[F]rom the first day he [the pupil] went to school he has been doing work that teaches the motives and principles of the uses to which the material world is put by his social environment, so that whatever work he goes into will really be a vocation, a calling in life, and not a mere routine engaged in only for the sake of pay."[56] It is the kind of "vocational" education Dewey distinguished from "trade" education, which he considered "an instrument of perpetuating unchanged the existing industrial order of society."[57] The place of industry in education was "not to hurry the preparation of the individual pupil for his individual trade."[58] Learning was not the work of "something ready-made called mind." According to Dewey, mind itself was an "organization of original capacities into activities having significance."[59] Vocational training, then, became a means of transforming the existing industrial order of society. The democracy which proclaimed "equality of opportunity" as its ideal required an education in which learning and social application, ideas and practice, work and recognition of the meaning of what is done are united from the beginning and for all.[60] Dewey praised the Gary schools, for they were "showing how the ideal of equal opportunity for all is to be transmuted into reality."[61]

4 Gary, Indiana: A Fading Gospel

Because of the publicity and support by scholars and opinion-makers like Dewey, the platoon system spread rapidly. In 1961, the American historian of education Lawrence Cremin wrote that "by 1916 it seems fair to say that most progressives, if asked to cite the leading example of progressive education, would probably have mentioned Gary."[62] Indeed, in the 1920s the plan was being used in over 1,000 schools in approximately 200 cities in 41 states in the United States, with an estimated enrolment of over 730,000 students around

55 Ibid., 311.
56 Ibid., 265.
57 Dewey, *Democracy and Education*, 369.
58 Dewey and Dewey, *Schools of Tomorrow*, 312.
59 Dewey, *Democracy and Education*, 368.
60 Dewey and Dewey, *Schools of Tomorrow*, 315.
61 Ibid., 316.
62 Cremin, *The Transformation of the School*, 155.

1920.[63] According to Thomas D. Fallace, another historian of education, the platoon system represented "the quintessence of progressive education" because of its use of administrative efficiency, its hands-on learning, its fusing of an academic and an industrial curriculum, its focus on the whole child, and its engagement with the community.[64] Although the Deweys were most impressed with the "social and community idea," it was the efficiency of the ways in which the school plant was used that contributed the most to the success and extensive growth of the platoon system.[65] Efficiency was "the heart and soul" of the platoon system, as Cohen phrased it, and no city embraced the "gospel of efficiency" as ardently as Gary.[66] As an educational innovation, the Gary Plan was clearly more managerial than curricular: the plan provided an enriched educational program for children, but more important was the administrative argument of financial savings.[67] It was with good reason that the educationist John Franklin Bobbitt (1876–1956) referred to Wirt as an "educational engineer." The term "plant" had implications far broader than "the pedestrian question of space utilization."[68]

The appropriation of the Gary Plan—that is, the "platooning" or "Garyizing" of systems throughout the United States[69]—nevertheless resulted mostly in a kind of semi-departmentalization.[70] It was criticized as a "part-time" scheme that accentuated "the usual evils of fragmentary schooling and demoralizing street life."[71] As a result, the platoon system would soon disappear from the national scene.[72] The Gary Plan itself began to unravel in the 1930s and was soon dismantled after Wirt's death in 1938. A survey of the Gary schools in 1940 described a public education system that had become "stultified in routine";

63 Callahan, *Education and the Cult of Efficiency*, 413.

64 Thomas D. Fallace, *Race and the Origins of Progressive Education, 1880–1929* (New York: Teachers College Press, 2015), 136.

65 Callahan, *Education and the Cult of Efficiency*, 57.

66 Ibid., 126; Cohen, *Children of the Mill*, 121; see also Reese, foreword to *Children of the Mill*, x; Kliebard, *The Struggle for the American Curriculum*, 76.

67 Kliebard, *The Struggle for the American Curriculum*, 83; Cremin, *The Transformation of the School*.

68 John Franklin Bobbitt, "The Elimination of Waste in Education," *The Elementary School Teacher* 12, no. 6 (1912): 260–61, cited in Kliebard, *The Struggle for the American Curriculum*, 83.

69 David Levine, "The Milwaukee Platoon School Battle: Lessons for Activist Teachers," *The Urban Review* 34, no. 1 (2002): 47–69.

70 Don C. Bliss, "Platoon Schools in Practice," *The Elementary School Journal* 20, no. 7 (1920): 510–15.

71 Bourne, *The Gary Schools*, 64.

72 Larry Cuban, "How Schools Change Reforms: Redefining Reform, Success and Failure," *Teachers College Record* 99, no. 3 (1998): 453.

the report noted "an almost religious devotion to the past" and a "creeping dilapidation" of many aspects of a system that but a few years earlier was "among the most glorious of educational triumphs."[73] It lasted in some form or another until 1960 when the system finally died "after a protracted illness."[74] Ironically, the school plants once hailed as ideal were either closed or demolished around the time of Gary's centennial.

5 Gary, Indiana: Stretching beyond the Age of Steel

The historian William J. Reese once wrote that "the historian's job is to ensure that we remember what too many people forget." He made this statement in 1990, when many citizens, he wrote, may think of Gary as only "one of America's numerous northern, rust belt cities, its schools impaired by familiar urban ills resulting from the legacy of racial discrimination and poverty amidst a collapsing economy."[75] Indeed, like other once-thriving centers of manufacturing, Gary ultimately became a ghost town. Today, Gary is a city plagued by physical decay, joblessness, concentrated poverty, and racial isolation.[76] Houses are crumbling, and lots lie empty on Broadway and Fifth Avenue, whose intersection was once the center of the business district.[77] Whole rows of shops and stores are boarded up and graffiti-covered. A blaze that swept through downtown Gary in October 1997 destroyed landmark buildings like the Memorial Auditorium and the Methodist Church. Gary made a journey from urban heyday to decay, from utopia to dystopia, from natural to urban wasteland. As a post-industrial city, it returned to its pre-industrial state with a touch of rust.

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73 Callahan, *Education and the Cult of Efficiency*, 58.

74 Cohen, *Children of the Mill*, xiv, xvii, 158; Cuban, "How Schools Change Reforms," 453.

75 Reese, foreword to *Children of the Mill*, x. The Rust Belt is the heavy-manufacturing region bordering the Great Lakes. The steel industry, car companies, and rubber tire production were the biggest Rust Belt industries. In the 1950s, the Rust Belt was an economic giant, accounting for more than half of all U.S. manufacturing jobs and about 43 percent of all U.S. jobs. See Simeon Alder, David Lagakos, and Lee Ohanian, *Competitive Pressure and the Decline of the Rust Belt: A Macroeconomic Analysis*, NBER Working Paper No. 20538 (Cambridge, MA: National Bureau of Economic Research, October 2014); Lee E. Ohanian, *Competition and the Decline of the Rust Belt*, Economic Policy Paper 14-6 (Federal Reserve Bank of Minneapolis, December 2014); see also George Hobor, "Surviving the Era of Deindustrialization: The New Economic Geography of the Urban Rust Belt," *Journal of Urban Affairs* 35, no. 4 (2012): 417–34.

76 Thomas J. Sugrue, *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton, NJ: Princeton University Press, 2005).

77 Brook, "Gary, Indiana," 43.

The white population, still comprising 80 percent of the population in 1930, dropped to 60 percent by 1960 and to 10 percent by 2000. Simultaneously, Gary's African-American population grew exponentially from less than 20 percent during the 1930s to almost 40 percent in 1960 and over 80 percent in 1990. The population, which peaked at approximately 178,000 in 1960, has decreased to approximately 76,000 today.[78] This demographic decline cannot be explained by economic factors only. As Sugrue argues, "[i]t is only through the complex and interwoven histories of race, residence [space], and work [economy] in the postwar era that the state of today's cities and their impoverished residents can be fully understood and confronted."[79] A decisive factor in this process was the election in 1967 of Richard Gordon Hatcher, the city's first black mayor. Fear of a city run by a black mayor led many white residents to leave Gary. It was the moment that Gary became a black city.[80] The white flight also meant that most schools in Gary became entirely black.

Like in other cities in the Northeast, Midwest, and West, the race question in Gary mainly goes back to the Great Migration, also called a "migration of desperation," which roughly took place between 1910 and 1970.[81] During this massive internal migration, African Americans left the rural South and met with poverty and racism from northern whites and immigrants who quickly learned the "color status hierarchy."[82] In Gary, the African Americans were forced into the Patch, where they settled among the immigrant groups. African Americans

78 United States Census Bureau, "Quick Facts—Gary, Indiana," https://www.census.gov / quickfacts/fact/table/garycityindiana/PST045216; Stats Indiana, "Indiana City/Town Census Counts, 1900–2010," http://www.stats.indiana.edu/population/PopTotals/historic_counts_cities.asp.

79 Sugrue, *The Origins of the Urban Crisis*, 5.

80 O'Hara, *Gary*, 138, 146; see also James H. Lytle, "Urban School Reform: To What End?," in *International Handbook of Urban Education*, ed. William T. Pink and George W. Noblit (Dordrecht: Springer, 2007), 861.

81 Mordecai W. Johnson, "The Negro and His Relationships," *National Conference on Social Welfare Proceedings* (1937): 64.

82 Theresa Richardson, "Moral Imperatives for the Millennium: The Historical Construction of Race and Its Implications for Childhood and Schooling in the Twentieth Century," *Studies in Philosophy and Education* 19 (2000): 301–27; Sugrue, *The Origins of the Urban Crisis*; Zeus Leonardo and Margaret Hunter, "Imagining the Urban: The Politics of Race, Class, and Schooling," in Pink and Noblit, *International Handbook of Urban Education*, 781; Betten and Mohl, "The Evolution of Racism in an Industrial City," 64. As De Genova argues, the defining and decisive feature of U.S. racist hegemony "has always been, and continues to be, precisely the systematic maintenance of a racial hierarchy in which whiteness is exclusively guarded as the most privileged condition [i.e., white supremacy]." See Nicholas De Genova, "The Stakes of an Anthropology of the United States," *The New Centennial Review* 7, no. 2 (2007): 250.

soon replaced the foreign-born laborers, which led to the ghettoization of the Patch.[83] By World War II, Gary had a clearly defined black ghetto, which was also enforced by the physical layout of the city as described above.[84] In this heavily segregated Gary, race would be a "continual sticking point."[85]

As a result of its emphasis on local conditions, with "environment" and "neighborhood" being the central notions, Dewey's discussion, in *Schools of Tomorrow*, of the Gary schools glided over this race question. In fact, Dewey accepted the status quo and what has been described as "de-facto segregation" in a multiracial, multiethnic, class-structured urban setting.[86] In addition, one should bear in mind that the great influx of African Americans to Gary only started with the 1919 steel strike, when they were used as strikebreakers.[87] That was five years after Evelyn Dewey had visited Gary. Visual documents, too, show only a few African Americans and a strongly segregated Gary. The photobook *Steel Giants*, for example, shows images from the image collection created by U.S. Steel and Inland Steel, housed in the Calumet Regional Archives.[88] The book primarily documents the first fifty years, until circa 1950, so it only shows

83 Brook, "Gary, Indiana," 49; Betten and Mohl, "The Evolution of Racism in an Industrial City," 52.

84 Betten and Mohl, "The Evolution of Racism in an Industrial City," 64.

85 Cohen, *Children of the Mill*, 156.

86 William W. Brickman, introduction to Dewey and Dewey, *Schools of Tomorrow*, xxiv–xxv; see, e.g., John Dewey, "The School as a Means of Developing a Social Consciousness and Social Ideals in Children," *National Conference on Social Welfare Proceedings* (1923): 450; see also Semel and Sadovnik, *"Schools of Tomorrow, Schools of Today,"* 364–65; Cohen, *Children of the Mill*. After the Supreme Court case of *Brown v. Board of Education* in 1954, for instance, the Gary School Board argued that "it was not responsible for integrating unintentional segregation caused by racial separation in neighborhoods" by calling the phenomenon "de-facto segregation"; cited in O'Hara, *Gary*, 137. One of the more critical pieces on Dewey as (essentially) racist is Frank Margonis, "John Dewey's Racialized Visions of the Student and Classroom Community," *Educational Theory* 59 (2009): 17–39. On Dewey's supposed silence on race, see also, e.g., Fallace, *Race and the Origins of Progressive Education*; Thomas D. Fallace, "Recapitulation Theory and the New Education: Race, Culture, Imperialism, and Pedagogy, 1894–1916," *Curriculum Inquiry* 42, no. 4 (2012): 510–33; Thomas D. Fallace, "Was John Dewey Ethnocentric? Reevaluating the Philosopher's Early Views on Culture and Race," *Educational Researcher* 39, no. 6 (2010): 471–77; Thomas D. Fallace, "Repeating the Race Experience: John Dewey and the History Curriculum at the University of Chicago Laboratory School," *Curriculum Inquiry* 39, no. 3 (2009): 381–405. On "white philosophy," see also Michael A. Peters, "Why Is My Curriculum White?," *Educational Philosophy and Theory* 47, no. 7 (2015): 641–46.

87 Brook, "Gary, Indiana," 41; Betten and Mohl, "The Evolution of Racism in an Industrial City," 52.

88 Stephen G. McShane and Gary S. Wilk, *Steel Giants* (Bloomington, IN: Quarry Books, 2009). The different sections show the building of the steel mills, the production of steel, the steel communities, and the steel people.

the heyday of the steel industry. The photographs contrast strongly with Gary's ruin photography—some refer to it as "ruin pornography"[89]—which aestheticizes and dramatizes spaces without any attempt to inquire what it meant to the people who inhabited them.

As Greg Grandin has argued with respect to Detroit, "degeneration was always already built into the opulence."[90] With Ann Laura Stoler, I would like to suggest that we look at Gary's ruins, including the abandoned schools and auditoriums, as "imperial debris"—that is, as "imperial formations" defined by racialized relations of allocations and appropriations.[91] These ruins are not just memorialized and large-scale monumental "leftovers" or relics of a glorious past, but "the aftershocks of empire …, the material and social afterlife of structures, sensibilities, and things" that "reside for instance in the gutted infrastructure of segregated cityscapes."[92] Colonialism is not a closed story, since racism replaced slavery as a "tool of social control in the concentration and segregation of African Americans at the bottom of society."[93] The notion of "empire" here is referring both to the "imperial configuration of the United States," emphasizing the "colonial dimensions of U.S. nationalism and national identity," and to Gary's particular history in which racialized segregation is inextricably bound to the role the industrial empire of U.S. Steel played in the development of Gary.[94]

Arthur Naparstek, an expert on urban redevelopment and neighborhood revitalization, calls it "one of our fundamental mistakes … that policies have not focused on people" and defines "the small community neighborhood as the locus for service delivery."[95] His plea for partnership in order "to make

89 Dora Apel, *Beautiful Terrible Ruins: Detroit and the Anxiety of Decline* (New Brunswick, NJ: Rutgers University Press, 2015). For examples of Gary's ruin photography, see, for instance:
http://www.forbidden-places.net/urban-exploration-gary-indiana-ghost-town#1
https://nl.pinterest.com/pittmoss/indiana-dunes-ruins-of-gary/
http://www.darkroastedblend.com/2011/07/exploring-ruins-of-gary-indiana.html
http://www.dewitzphotography.com/personal-photography-projects/ruin-porn-of-the-past-united-states-murder-capital-gary-in/
http://desertedplaces.blogspot.com/2016/04/the-abandoned-ruins-of-gary-indiana.html.

90 Greg Grandin, "Empire's Ruins: Detroit to the Amazon," in *Imperial Debris: On Ruins and Ruination*, ed. Anna Laura Stoler (Durham, NC: Duke University Press, 2013), 116.

91 Ann Laura Stoler, "Imperial Debris: Reflections on Ruins and Ruination," *Cultural Anthropology* 23, no. 2 (2008): 193.

92 Ibid., 194.

93 Ibid., 210; Richardson, "Moral Imperatives for the Millennium," 317.

94 De Genova, "The Stakes of an Anthropology of the United States," 243, 247.

95 Arthur J. Naparstek, "Community Empowerment: The Critical Role of Neighborhoods," *National Conference on Social Welfare Proceedings* (1980): 56.

democracy real" is based on his experience in the late 1960s, when he worked in Gary as an assistant to mayor Hatcher. What is needed to make that partnership happen is "the dependence of social reorganization upon educational reconstruction," as Dewey phrased it in *Democracy and Education*: "It signifies a society in which every person shall be occupied in something which makes the lives of others better worth living, and which accordingly makes the ties which bind persons together more perceptible—which breaks down the barriers of distance between them."[96] Dewey warned, however, "that we are far from such a social state" and added that, "in a literal and qualitative sense, we may never arrive at it."[97]

In 1923, in the aftermath of the First World War, Dewey referred to "the growth in the last ten years of social intolerance" as "[t]he most discouraging symptom of American life today," arguing that "these causes of division, of separation, and of mutual distrust may not go on growing among us," and emphasizing the importance of social work by urging teachers to be "leaders in social work."[98] More recently, Ian Shaw referred to "the urban desert" when pointing at the unexplored potential for social work research and practice in the city.[99] Indeed, there is more wasteland to be cultivated by both researchers and practitioners in order to make the city an "arena for learning democracy."[100] Looking at Gary, then, their focus should be on an economic turnaround for the Rust Belt, an urban economic transformation, or an emphasis on "post-deindustrialization" rather than on "deindustrialization."[101] In this process, renewed interest should go to the school as a social clearinghouse by (re)establishing bonds between schools and neighborhoods that, in conjunction with forms of non-formal education and community work, hold the potential

96 Dewey, *Democracy and Education*, 369, 373.

97 Ibid., 370.

98 Dewey, "The School as a Means of Developing a Social Consciousness," 450, 453.

99 Ian Shaw, "Social Work Research: An Urban Desert?," *European Journal of Social Work* 14, no. 1 (2011), 11–26. Seen from this perspective, it is no coincidence that Sand is first and foremost remembered as a pioneer of international social work. See, e.g., Kerstin Eilers, "René Sand (1877–1953) and His Contribution to International Social Work, IASSW-President 1946–1953," *Social Work & Society* 5, no. 1 (2007): 102–9; Lynne M. Healy, "Introduction: A Brief Journey Through the 80 Year History of the International Association of Schools of Social Work," *Social Work & Society* 6, no. 1 (2008): 115–27; Anette Kniephoff-Knebel and Friedrich W. Seibel, "Establishing International Cooperation in Social Work Education: The First Decade of the International Committee of Schools for Social Work (ICSSW)," *International Social Work* 51, no. 6 (2008): 790–812.

100 Gert J. J. Biesta, *Learning Democracy in School and Society: Education, Lifelong Learning, and the Politics of Citizenship* (Rotterdam: Sense Publishers, 2011).

101 Hobor," Surviving the Era of Deindustrialization," 417.

to amount to what has once been coined a "community revolution."[102] What is needed for that are "social imagineers" instead of "social engineers."[103] As Lawrence Cremin wrote, referring to the motto on the Great Seal of the United States: "Democracy becomes the persistent quest for the 'more perfect union,' a kind of continuing social process of *e pluribus unum* [out of many, one]."[104] This quest makes it worth to connect past, present, and future and to look beyond the "age of steel."

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102 Daniel Bell and Virginia Held, "The Community Revolution," *The Public Interest* 16 (1969): 142–77; Hurley, "Challenging Corporate Polluters," 299.

103 Henry A. Giroux, *The Mouse that Roared: Disney and the End of Innocence* (Lanham, MD: Rowman and Littlefield, 1999); Leonardo and Hunter, "Imagining the Urban," 779.

104 Cremin, *The Transformation of the School*, 121; see also Robert D. Putnam, "E Pluribus Unum: Diversity and Community in the Twenty-First Century. The 2006 Johan Skytte Prize Lecture," *Scandinavian Political Studies* 30, no. 2 (2007): 137–74.

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