

Copyright 2014 Kristen Ann Ehrenberger

THE POLITICS OF THE TABLE:
NUTRITION AND THE TELESCOPIC BODY IN SAXON GERMANY, 1890-1935

BY

KRISTEN ANN EHRENBERGER

DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in History
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2014

Urbana, Illinois

Doctoral Committee:

Professor Peter Fritzsche, Chair
Professor Mark Micale, Co-Chair
Professor Leslie Reagan
Associate Professor Tamara Chaplin

Abstract

In early twentieth-century Germany, nutrition was important for both individual health and collective well-being because of what I call the “telescopic perspective.” This mode of thinking connected a nation of eaters (and drinkers) from the level of the international food trade all the way down to the vitamins that nourished their cells. It combined a positivist belief in the ability of medicine to heal social ills with a tendency across the political spectrum to describe the nation as an organic whole. It also required a certain amount of scientific literacy among the general public about the possible interactions between various foods and their bodies: good and bad tastes, energy, indigestion, disease or its prevention, pleasure, pain. My work expands the dichotomy between individual and social bodies to include the anatomical parts that constitute the eating individual and that individual’s multiple spheres of social belonging and identity (family, nation, religion, etc.).

“The Politics of the Table” describes some of the ways in which Germans attempted to influence the contents and contexts of each other’s meals in the name of health, identity, politics, and economics, particularly from World War I onward. In the decades around 1900, mainstream and alternative medical practitioners, popularizers of science, and food industrialists offered conflicting advice about proper nutrition for the sick and the well. During and after World War I, Germans participated in a population-wide experiment in the socialization of the food system that escalated into a debate about who should be allowed to consume what scarce resources. While discussions about the centrality of the family table crystallized many of the classed and gendered dimensions of Germans’ foodways, the way rations were organized and justified revealed fissures within the body politic. Finally, from the 1920s through the 1940s, fears over the fate of both the political and biological empire focused the concerns of hygienists and policy

makers onto the survival of the “telescopic body.” They insisted that the calories and nutrients consumed by an aggregate of individuals determined the health of the nation (*das Volk*), the race (*die Rasse*), and/or the social body (*der Volkskörper*). Throughout this period, even as public rhetoric increasingly placed the burden of responsibility for the health of the nation on their shoulders, women participated in these discussions as both givers and consumers of advice, as both expert and ignorant about what to eat and why.

Acknowledgements

The fact that individual authorship is the norm for dissertations written in the discipline of history should in no way obscure the fact that this one benefitted from the interest, help, and support from more persons than I can remember to name here. I appreciate my advisers, Peter Fritzsche und Mark Micale, for allowing me to take on a project that straddled their fields of expertise and for finding the right balance of encouragement and instigation to help me complete it. They are friends and mentors, as are my readers, Leslie Reagan and Tamara Chaplin. My best friend of all, my husband Michael Hammer, did me a great service by interesting himself in my project enough to mark its progress but also by reminding me of the many other things in our lives that mattered along the way.

Profuse thanks are due to colleagues on both sides of the Atlantic Ocean. In the United States: Uwe Spiekermann (GHI DC), Mike Sappol (NLM/NIH), Corinna Treitel (WashU), Avi Sharma (UChi), Drew Bergerson (UMKC), Heather Perry (UNCC), and Kathryn Olesko (Georgetown). In Germany: Sybilla Nikolow, Thomas Steller, Anna-Gesa Leuthardt, and the rest of the DHMD Arbeitsgruppe at the Universität Bielefeld; Susanne Roessiger, Marion Schneider, and Ute Krepper at the Deutsches Hygiene-Museum Dresden; Claudia Stein (Warwick/MPI-Berlin); Marina Lienert and Caris-Petra Heidel at the Institut für Geschichte der Medizin (TU Dresden); Christian Rummel; the archivists at the Sächsisches Hauptstaatsarchiv, the Stadtarchiv in Dresden, and the Geheimes Staatsarchiv Preußischer Kulturbesitz (Berlin-Dahlem); the staff at the Sächsische Lands- und Universitäts-Bibliothek (Dresden), the Deutsche National Bibliothek (Leipzig), the Staatsbibliothek Berlin, the Bundes Filmarchiv (Berlin-Wilmersdorf), and the Stadtarchiv in Braunschweig; and Gisela Franke and the corps of volunteers who willingly spent long hours with me at the Deutsches Kochbuch Museum in Dortmund.

Under the sponsorship of Winfried Müller und Josef Mazerath at the Technische Universität Dresden (TUD), the Deutsche Akademische Austauschdienst (DAAD) supported my research with a full travel grant for the academic year 2010-2011. The History Department at the University of Illinois at Urbana-Champaign (UIUC) provided funding for a pre-dissertation travel grant in summer 2006 and a writing fellowship in spring 2013. A Dissertation Completion Fellowship from the UIUC Graduate College allowed me to complete the project during the academic year 2013-2014. I also owe a very great debt to the UIUC Interlibrary Loan program and its patient staff.

I have enjoyed the opportunity to present portions of this project at meetings of the American Association of the History of Medicine, the National Conference for Physician-Scholars in the Social Sciences and Humanities, the German Historical Institute's Transatlantic Doctoral Seminar, the Wits Institute for Social and Economic Research (WiSER), the Joint Atlantic Seminar for the History of Medicine (JASHM), the UIUC German Colloquium, and the UIUC Medicine & Science Reading Group. Much of this travel was generously funded by the Thomas Buetow Fund at the UIUC College of Medicine. In addition, John Heartfield and the Deutsches Hygiene-Museum Dresden granted permission to reproduce images.

Finally, I would like to thank the five kind souls who loaned me a laptop or printer over the many years it took me to research and write this project. Thanks also to the friends, acquaintances, and sometimes complete strangers who expressed interest in a dissertation about food and bodies a century ago. I am particularly appreciative for the Germans who befriended me while I lived in their country and researched their history. I dedicate this project to my ever-loving husband, who accompanied me to archives, listened patiently at the dinner table as I went

on about my latest findings, and graciously helped me eat the results of cooking experiments from the pages of my sources.

Table of Contents

| | |
|--|------|
| Preface..... | viii |
| Introduction: Bodies that Eat (and Drink)..... | 1 |
| Part I: “The Kitchen is the Laboratory of the Housewife”: The Circulation of Nutritional Science..... | 38 |
| Introductory Essay to Part I: Nutrition in the Laboratory, 1890-1930..... | 39 |
| Part I – Illustration..... | 63 |
| Chapter 1: Feeding the Sick: Nutrition and Authority in the Sick Room and the Clinic..... | 64 |
| Chapter 2: Under the Hygiene Eye: Nutrition at the German Hygiene Museum | 98 |
| Chapter 2 – Illustrations..... | 139 |
| Chapter 3: How to Cook Your Vegetables, or Ragnar Berg’s Controversy with the Canning Industry..... | 141 |
| Part II: “The Cooking Spoon is the Scepter of the People’s Health”: Nutrition & World War I..... | 186 |
| Introductory Essay to Part II: The Blockade and Rationing in Saxony..... | 187 |
| Chapter 4: The Politics of the Family Table During World War I..... | 208 |
| Chapter 4 – Illustration..... | 242 |
| Chapter 4 – Tables..... | 243 |
| Chapter 5: Special Rations: How the War Came to Sick Rooms in Dresden..... | 252 |
| Conclusion: Nutritional Knowledge and Power in the Third Reich..... | 297 |
| Conclusion – Illustration..... | 322 |
| Appendix: Illustrations..... | 323 |
| Bibliography..... | 333 |

Preface

In keeping with the theme of food and foodways, one could describe this dissertation as a ten-course meal. (That's long enough to be a formal banquet, so feel free to take your time when reading and digesting what follows. May I suggest pouring yourself a nice glass of Riesling?) The Acknowledgements were like oysters on the half shell garnished with lemon slices and set out on ice while the guests assembled. The Introduction presents the concept of the telescopic body like a soup course "to stimulate the stomach, not weigh it down." Just as cookbook authors Henriette Davidis and Luise Holle thought appetizers should "tickle the palate," so the Introductory Essay to Part I on the development of the Newer Knowledge of Nutrition between 1890 and 1930 describes the state of the science at the time and the role of the laboratory in establishing its authority.¹

With Chapter 1, the starter course, we have begun the meal proper. Whereas the two hostesses suggested a light meat such as steamed poultry or fish, I will argue that the wealth and breadth of nutritional knowledge available across the spectrum of dietary and clinical expertise provided the scientific literacy that made a biologized cultural metaphor like the telescopic body a rhetorical and conceptual possibility. According to Davidis-Holle, the hot and cold entrées served next should be the most complicated dishes and the highlights of the meal. This is an apt description of Chapter 2, which grounds my theory with an in-depth look at how the German Hygiene Museum in Dresden showcased a telescopic perspective from macromolecules to the nation. If that chapter is a ragout of museum studies and cultural history, then Chapter 3 is a reception-study galantine, a cold meatloaf stuffed with observations about the selective uptake of scientific nutrition in domestic and industrial kitchens.

¹ Davidis-Holle, *Das Praktische Kochbuch* (Bielefeld: Velhagen & Klasing, 1901), 740-741.

Part II also begins with an Introductory Essay, rather like the warm pudding that would be served next at a traditional banquet; it describes how rationing (mal)functioned in Saxony during World War I. Chapter 4 serves up a hearty roast of debates over the family table and “collective feeding” initiatives during the war. The novel case study in Chapter 5 on rations for the sick in Dresden takes the place of the vegetable course; hopefully it is as easy to digest as young peas or asparagus tips. For dessert, the Conclusion considers the themes of ignorance, National Socialist food ideology and practice, and the telescopic body in the early years of the Third Reich. Last not least, to give the reader a “taste” of what early twentieth-century Germans put on their tables, I have opened each chapter with a recipe or two. An appendix at the very end offers numerous illustrations in addition to those included at the end of certain chapters. *Guten Appetit!*

Introduction: Bodies that Eat (and Drink)

“Already this short preview of the content of the exhibition makes it clear to everyone, that this ‘100-Day Show’ applies

TO THE WHOLE GERMAN PEOPLE:

to every family and to every housewife—the combined 10 million German households make 30 billion Marks in purchases every year!—, to the **physician and hygienist**, to the **statesman and civil servant**, just as to every **community leader**, furthermore to all **political economists, scholars**, to every **teacher**, every **city- and country-dweller**, to all **farmers**, to the **salesmen and businessmen** in the food industry and to all **restaurant owners, industrialists and technologists**, to every **gymnast and athlete and therefore**

A L S O T O Y O U,
who and whatever you are!

It touches you personally...., you surely will have come to this impression after this brief sketch of the 100-Day Show.”²

The large and well-advertised “Nutrition” (*Die Ernährung*) exhibition this breathless passage announced for the summer of 1928 marked the high point in public visibility of a subject of sustained personal, economic, and political interest over the forty-year period this dissertation covers. According to the Exhibition, Trade Fair and Tourism Office of the city of Berlin and the German Hygiene Museum in Dresden, this exhibition combined the best parts of commercial and educational installations into a “one hundred-day” event whose anatomical models, statistical displays, and working factory machines would enlighten visitors and encourage them to eat better. In three and a half months, 750,000 visitors paid 1.50 Marks each to wander through the

² “Schon dieser kurze Einblick in den Inhalt der Ausstellung macht es jedem klar, daß diese ‘Schau der hundert Tage’ sich / AN DAS GANZE DEUTSCHE VOLK / wendet: an jeder Familie und an jede Hausfrau ohnehin—werden doch allein in den zehn Millionen deutschen Haushalten 30 Milliarden Umsatz im Jahr erzielt!—, an den Arzt und Hygieniker, an den Staatsmann und Verwaltungsbeamten, genau so wie an jeden Kommunalpolitiker, darüber hinaus an alle Volkswirtschaftler, Gelehrten, an jedem Lehrer, jeden Stadt- und Landbewohner, an alle Landwirte, an die Kaufleute und Gewerbetreibenden der Lebensmittelbranche und an alle Gastwirte, an Industrielle und Techniker, an jeden Turner und Sportler und darum / A U C H A N S I E, / wer und was immer Sie sein mögen! Es geht Sie persönlich an...[sic], diesen Eindruck werden Sie wohl aus den kurzen Darlungen über die Schau der 100 Tage gewonnen haben.” “An Alle—An Jeden,” doc. 112b, Nr. 2175 Ausstellungen landwirtschaftlichen Gegenstände im Inlande (1907-1932), 11168 Ministerium für Wirtschaft, SHAD. Unless otherwise noted, all translations are my own.

spacious halls and grounds around the radio tower at Kaiserdamm. They might have come from any combination of genuine interest, curiosity, and boredom; but none of them could claim that nutrition was not important to or did not affect him or her, according to the all-encompassing rhetoric of the announcement: “it touches you personally.”³

Cultural critic Walter Benjamin (1892-1940) wrote of the spectacle, “Like a gaping wide herald’s mouth, this exhibition was a delightful, outrageous, clamorous maw.”⁴ The 45,000 square meters (almost 500,000 square feet) of displays—7-8 times more than the 1926 welfare exhibition in Düsseldorf had allotted for nutrition—threatened to swallow visitors whole.⁵ Display techniques had changed so much from old, dry statistics that Benjamin wondered whether the scientific messages about the proper feeding of infants or the production of sanitary milk were lost in the gimmickry of wet nurses depicted in angelic or demonic representations and cows exhibited with the mountain of fodder necessary to produce a year’s worth of milk.⁶ The less critical praised how “one learns—always in clear, often in witty and amusing form—first the basics of metabolism and then the requirements of nutrition.”⁷ Attendees could observe moving models of physiological functions like breathing and blood circulation, and they could calculate their individual recommended daily caloric intake. There were demonstrations of how foods could be stored or processed according to state regulations to avoid spoilage and model kitchens for collective feeding (*Massenspeisung*) of soldiers and the poor. One newspaper

³ A single adult ticket cost 1.50 M; children, students, and soldiers received reduced prices of 0.75-1 M; and social organizations, unions, and other groups could buy 100 tickets for 1 M each. “An Alle—An Jeden.”

⁴ “Wie ein weit aufgerissenes Heroldsmaul, eine herrliche, unverschämte, schallende Schnauze war diese Ausstellung.” Walter Benjamin, “Jahrmarkt des Essens: Epilog zur Berliner Ernährungsausstellung,” in *Gesammelte Schriften*, ed. Rolf Tiedemann and Hermann Schweppenhäuser, vol. IV, part 1, ed. Tillman Rexroth, 527-532 (Frankfurt am Main: Suhrkamp Verlag, 1972), 527.

⁵ Pp. 2-3, “Nahrungsmittelproduktion, -Industrie und -Grosshandel und die Ausstellung ‘Die Ernährung’ Berlin 1928,” doc. 95, Nr. 2175 Ausstellungen, 11168 MfW, SHAD. This prospectus was distributed with an invitation to businesses to participate in the exhibition.

⁶ Benjamin, “Jahrmarkt des Essens,” 529, 532.

⁷ “Dann lernt man, immer in anschaulicher, oft in witziger und amusanter Form, die Grundlagen des Stoffwechsels kennen, um schließlich zum Nahrungsbedarf zu kommen.” “Der Mensch ist, was er ißt. Rundgang durch die Berliner Ernährungsausstellung,” *Dresdner Anzeiger* 198, no. 216 (9 May 1928): 5.

declared, “The exhibition should and will be a clarion call to all and will generate awareness that the solution to the nutrition question is an existential question for every individual as well as for the whole of the Volk.”⁸

What before World War I had often been described as a matter of class or of individual lifestyle was increasingly framed as one of collective well-being in the post-war moment: health reformers and civic boosters argued that the shopping baskets, tables, and digestive tracts of Germans throughout the Reich were inextricably linked. The highly commercial “Nutrition” exhibition in Berlin and the smaller, more scientific version “Proper Nutrition” (*Richtige Ernährung*) that traveled under the auspices of the Hygiene Museum in 1928 and 1929 emphasized scientific, practical, and inexpensive foodways under the motto “service to the people” (*Dienst am Volk*). This was sensational education and informative propaganda. In their proposal, the Tourist Office explained that “The dependence of the individual person, the entire population, and economic life on nutrition will be shown, as well as their relationship to city and countryside and to the health and wealth of the nation.”⁹

While “Nutrition” and similar campaigns addressed their advice to “every individual”—and while the social body to which these ends were directed was not overtly sexed or gendered—the implementation of good nutritional hygiene definitely was. At the time, “homo consumens” was assumed to be female and simultaneously responsible and irresponsible in her spending habits: on the one hand in charge of her household’s consumption, on the other hand incapable of

⁸ “So soll und will die Ausstellung ein Weckruf an alle sein und will ihnen zum Bewußtsein bringen, daß die Lösung der Ernährungsfrage eine Existenzfrage für jeden einzelnen wie für die Gesamtheit des Volkes bildet.” “Die Ernährung. Die Ausstellung der Stadt Berlin und des Deutschen Hygienemuseums,” *Dresdner Anzeiger* 198, no. 187 (21 April 1928): 4.

⁹ “Es soll die Abhängigkeit des einzelnen Menschen, des ganzen Volkes und des Wirtschaftslebens von der Nahrung gezeigt werden und ihre Beziehungen zu Stadt und Land, Volksgesundheit und Volksvermögen.” Page 2 in *Die Ernährung: Ausstellung für Gesunde und Zweckmässige Ernährungsweise* 28. April bis 5. August in den Ausstellungshallen am Kaiserdamm, *Ausstellungsplan*, doc. 3, Nr. 558 “Die Ernährung” Berlin 1928, 11168 MfW, SHAD.

managing her money wisely.¹⁰ A woman's domestic work feeding and clothing her family "are all points at which the housewife expresses her whole warm heart, her full capacity for love, and her desire [or urge, *Drang*] to be helpful; through which she can contribute to the recovery of our sick Fatherland; [and are ways] in which the housewives of all [social] groups, all ages, all parties, and all faiths can and should go forward hand in hand," wrote a local housewives magazine in 1925.¹¹ Between the economic troubles of the 1920s, the National Socialists' socioeconomic policies in the 1930s and 1940s, and the two World Wars, German wives and mothers (were) asked to shoulder an increasingly heavy burden of responsibility for the nourishment and health of themselves, their dependents, and the nation.¹²

Retrospectively, however, it is impossible in the realm of food and eating to divide the experts and laity by sex or gender. Due to educational constraints, most laboratory scientists and physicians were men, and they presented themselves as objective observers, but female domestic scientists and cookbook authors often grounded their credibility in their sex and in their conventional social positions as wives and homemakers.¹³ After 1900, women gradually joined the ranks of university-trained, "scientific" authorities, from which they sought to influence the

¹⁰ Inga Wiedemann, *Herrin im Hause. Durch Koch- und Haushaltsbücher zur bürgerlichen Hausfrau* (Pfaffenweiler: Centaurus, 1993), 69-75; Gudrun M. König, "Die Erziehung der Käufer. Konsumkultur und Konsumkritik um 1900," *Vokus* 15 (2005): 39-57; and for the term *homo consumens* see Wolfgang König, "Homo consumens: Historische und systematische Betrachtungen," in *Einkaufen: eine Geschichte des täglichen Bedarfs*, ed. Peter Lummel and Alexandra Deak, 189-202 (Berlin: Verein der Freunde der Domäne Dahlem, 2005).

¹¹ "Das sind alles Punkte, bei denen die Hausfrau ihr ganzes, warmes Herz, ihre volle Liebefähigkeit und ihren Drang zur Hilfsbereitschaft betätigen, durch die sie an der Gesundung unseres kranken Vaterlandes mitarbeiten kann, in denen die Hausfrauen aller Kreise, aller Alter, aller Parteien und aller Bekenntnisse Hand in Hand vorwärts gehen können und sollen." G. v. Erdmannsdorff, "Zur Begrüßung," *Dresdner Hausfrauen-Zeitung* 1, no. 1 (15 April 1925): 1. The author writing on behalf of the editorial board is either Gottfried von Erdmannsdorff (1893-1946), then a captain in the Saxon military, or more likely his wife, Margaretha Freiin von Hausen (1894-1963).

¹² Nancy Ruth Reagin, *Sweeping the German Nation: Domesticity and National Identity in Germany, 1870-1945* (New York: Cambridge University Press, 2007); Michelle Mouton, *From Nurturing the Nation to Purifying the Volk: Weimar and Nazi Family Policy, 1918-1945* (New York: German Historical Institute & Cambridge University Press, 2007); Lisa Pine, *Nazi Family Policy, 1933-1945* (Oxford: Berg, 1997); Claudia Koonz, *Mothers in the Fatherland: Women, the Family and Nazi Politics* (New York: St. Martin's Press, 1987).

¹³ Sarah Stage and Virginia B. Vincenti, eds., *Rethinking Home Economics: Women and the History of a Profession* (Ithaca: Cornell University Press, 1997); and Laura Shapiro, *Perfection Salad: Women and Cooking at the Turn of the Century* (New York: North Point Press of Farrar, Straus and Girard, 1986).

foodways of ordinary Germans. Each generation of young women was portrayed as ignorant of the “right” ways to shop, cook, and eat, providing renewed opportunities for experts of all kinds to cater to their (perceived) needs. It is easy to see the dissemination of nutritional science information as an example of social control theories or of cynical attempts by “quacks” and unscrupulous food manufacturers to capitalize on Germans’ naivety in a quickly changing food economy. But I do not want to lose sight of their deep personal and collective interest in eating well, which created opportunities for both discipline and advancement for women.

The “Nutrition” exhibition, like the Hygiene Museum that provided the scientific displays, was a public-private partnership.¹⁴ Since the founding of the German Empire in 1871, public health had been the provenance of a few government institutions responsible for research, regulation, and charity care of the poor, and of many (semi-)private social welfare organizations that provided food, clothing, clinics, and—especially after 1900—information and education about all facets of hygiene, whether in the form of an information center for new mothers, an evening lecture on first aid illustrated with glass lantern slides for a hiking group, or exhibitions of various sizes and states of permanency about infectious illnesses such as tuberculosis and venereal disease.¹⁵ World War I had centralized some of these functions, but during the Weimar Period, public and private organizations proliferated.¹⁶ “Nutrition” also fulfilled in part the promises of the new welfare state; according to the Weimar constitution, the federal, state, and

¹⁴ Heinrich Zerkaulen, ed., *Das Deutsche Hygiene-Museum: Festschrift zur Eröffnung des Museums und der Internationalen Hygiene-Ausstellung Dresden* (Dresden: Wolfgang Jess, 1930); Thomas Steller, “‘Eine Hochschule für Jedermann!’—Die Bedeutung des Deutschen Hygiene-Museums als Akteur nationaler und internationaler Wissenspopularisierung im Zeitraum 1900-1935” (diss., Univ. Bielefeld, in progress).

¹⁵ Axel C. Hüntelmann, *Hygiene im Namen des Staates: Das Reichsgesundheitsamt 1876-1933* (Göttingen: Wallstein Verlag, 2008); Johannes Vossen, *Gesundheitsämter im Nationalsozialismus: Rassenhygiene und offene Gesundheitsfürsorge in Westfalen 1900-1950* (Essen: Klartext, 2001).

¹⁶ Paul Weindling, “Public Health in Germany,” in *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times*, ed. Dorothy Porter, 119-131 (London: Routledge, 1999); Wolfgang U. Eckart, “Öffentliche Gesundheitspflege in der Weimarer Republik und in der Frühgeschichte der Bundesrepublik Deutschland,” *Das Öffentliche Gesundheitswesen* 51, no. 5 (1989): 213-221.

local municipalities would foster and protect the health of families and workers, who had a duty to each other.¹⁷

When in 1928 the Berlin municipal government partnered with the Hygiene Museum and about 160 other businesses and organizations to celebrate the German food industry from field to plate, the key phrase was “rational nutrition.” Rational nutrition was healthful, inexpensive—and “among the most important tasks of public affairs.” Why? “Because only when the individual is correctly and sufficiently nourished can he fulfill his task as part of the national collective, his work.”¹⁸ While it might be obvious that what millions of Germans ate at their breakfast tables, drank on their coffee breaks, or supped from their sick beds affected the domestic and international economies, the national importance of nutritional health was not a foregone conclusion. It could have just as easily been that only a well-read or well-bred population could secure the fortunes of the nation-state. Not for these boosters: Germans’ foodways affected “one of the fateful issues of the world. Wars are fought over the feeding of peoples,” they wrote in a business prospectus during the lead-up to the 1928 exhibition.¹⁹

The allusion to war would not have been lost on readers, for a decade after the cessation of hostilities with the Allies but only five years after the end of the very last rations, the topic of war and food was a loaded one for Germans. During and after World War I, no issue had

¹⁷ Esp. Section II, Article 119, on the family as the building block of society, and Section V, Article 163, which declared, “Every German has the moral obligation, his personal freedom notwithstanding, to exercise his mental and physical powers in a manner required by the welfare of all.” Detlev J. K. Peukert, *The Weimar Republic: The Crisis of Classical Modernity*, trans. Richard Deveson (New York: Hill and Wang, 1989), 129-134.

¹⁸ “Die vernunftgemässe Ernährung, also eine Ernährungsweise, die gesund und billig ist, stellt eines der Fundamente der Gesundheit dar. Die Erforschung aller Fragen, die mit der Ernährung eines Volkes zusammenhängen, gehört zu den wichtigsten Aufgaben eines Staatswesens. Nur wenn der einzelne richtig und ausreichend ernährt wird, kann er seine Aufgabe als Teil des Volksganzen, seine Arbeit, leisten.” “Nahrungsmittelproduktion, -Industrie und -Grosshandel und die Ausstellung ‘Die Ernährung’ Berlin 1928,” doc. 95, Nr. 2175 Ausstellungen, 11168 MfW, SHAD.

¹⁹ “Die Aufgabe, an die die Ausstellung herangeht, ist ganz gewaltig, beschäftigt sie sich doch mit einer Schicksalsfrage der Welt. Um die Ernährung der Völker werden die Kriege geführt.” Page 2, “Nahrungsmittelproduktion, -Industrie und -Grosshandel und die Ausstellung ‘Die Ernährung’ Berlin 1928,” doc. 95, Nr. 2175 Ausstellungen, 11168 MfW, SHAD.

revealed more starkly the contours and fractures of German society than who got to eat how much of what scarce comestibles, because no one existed outside the fraught food economy. Children ate in public kitchens while workers lunched in factory canteens; housewives bartered away the coupons they could not afford to redeem in stores; shopkeepers set aside choice cuts for friends or lovers; farmers illegally enjoyed increasingly lean hogs; and bureaucrats tried to ignore both the black market and their hungry off-springs' pleas for something more to eat. Both the hoarders and the helpless learned the importance of food for individual well-being; and the partisan, class, and urban-rural divides that the situation exacerbated demonstrated its importance to the collective weal as well.

The critical situation resulting from the Allied blockade and poor government planning taught Germans three lessons: a utilitarianism that controlled access to the national table, resourcefulness to the point of illegality, and distrust of the international market that fed a movement for food autarky. Under conditions of general scarcity, local and national governments codified in the official rationing system a common practice of working-class families who struggled to make ends meet: rewarding family members who went out to work with more and better food. The gnawing physical and psychological discomforts of not consuming enough fat and protein during and after World War I encouraged Germans of all classes to develop a national discourse about the importance of one's contributions to the national welfare in determining one's human value in that community. As a whole, Germans hungered but they did not starve, in large part because most of them could and did make use of the black market that undermined the public market on which the most damning nutritional statistics (i.e. calories rationed per day) have been based. Given the desire to avoid another man-made famine, the shift toward independence from imports of foreign fertilizer, fodder, and

foodstuffs was understandable but unrealistic for an industrialized nation in a global economy. All these features are familiar to historians of the Third Reich and World War II, but they did not originate with the National Socialists, and they do not exhaust the public dialogues about what and how to cook, eat, and drink in the four decades leading up to 1933.

Nutrition appeared in textbooks, advice books, magazine articles, advertisements, public speeches and exhibitions, movie shorts, and government regulations in late-nineteenth and early twentieth-century Germany. In Saxony, school children learned about digestion and other bodily functions from teaching materials provided gratis from the workshops associated with the Hygiene Museum. With the exception of semi-official censorship during World War I, a wide variety of information about food and nutrition was readily available. So it is not surprising that the “Nutrition” exhibition organizers appealed “to the whole German people” about the contents of their market bundles, cooking pots, and stomachs. Historians have ably traced its development as a diverse set of scientific, economic, social, and cultural forces, showing that advice about what to eat was never purely “scientific.”²⁰ They have devoted less attention to eating and the social body. Why was nutrition “an existential question”—not just for personal but also for collective health? Put another way, how was it possible that the nutrients and calories consumed by an aggregate of individuals influenced the well-being of the nation?

²⁰ Edith Heischkel-Artelt, ed., *Ernährung und Ernährungslehre im 19. Jahrhundert. Vorträge eines Symposium am 5. und 6. Januar 1973 in Frankfurt am Main* (Göttingen: Vandenhoeck & Ruprecht, 1976); Hans Jürgen Teuteberg and Günter Wiegelmann, *Unsere tägliche Kost: Geschichte und regionale Prägung* (Münster: F. Coppenrath, 1986); Teuteberg and Wiegelmann, *Der Wandel der Nahrungsgewohnheiten unter dem Einfluss der Industrialisierung* (Göttingen: Vandenhoeck und Ruprecht, 1972); Teuteberg, ed., *European Food History: A Research Review* (New York: Leicester University Press/St. Martin's Press, 1992); Teuteberg, ed., *Die Revolution am Esstisch. Neue Studien zur Nahrungskultur im 19./20. Jahrhundert* (Stuttgart: Franz Steiner, 2004); with some reservations about his simplified narrative of modernization and the triumph of medical science, Detlef Briesen, *Das gesunde Leben: Ernährung und Gesundheit seit dem 18. Jahrhundert* (Frankfurt am Main: Campus Verlag, 2010); and Uwe Spiekermann, “Die Genese der modernen Ernährung in der Wissens- und Konsumgesellschaft Deutschlands 1880-2000” (Habilitationsschrift, Univ. Göttingen, 2008), pub. as *Künstliche Kost. Die Genese der modernen Ernährung in der Wissens- und Konsumgesellschaft Deutschland 1880-2000* (Göttingen: University of Göttingen, forthcoming).

The telescopic body

In the early twentieth century, a conceptual framework developed that biologically and metaphorically connected individual and social bodies through such physiological and social functions as eating and drinking, physical exercise, and sex and reproduction. This framework, which I call the “telescopic body,” made the hygiene habits of each German the concern of other Germans. An increasingly common rhetorical tool in the fields of politics and public health, this mindset combined a half-century tradition of nutritional science, a positivist belief in the ability of medicine and science to heal social ills, and a tendency across the political spectrum to think of “Germany” as an interconnected organic whole.²¹ The same biological connectivity that informed eugenics and racial hygiene inspired telescopic thinking.²² Narrowly speaking, the nutrients and calories individuals took in determined the well-being of the collective they made up. Broadly speaking, telescopic perspectives on nutrition problematized the consumption of food and drink as simultaneously a manifestation of natural physiological dictates and as a distillation of national economics, politics, and health. The conditions for the development of this biopolitical discourse included a scientifically literate population with disposable income and a desire for nationalist and/or collectivist politics.²³ World War I marks an inflection point toward increased reliance on this framework in public discourse, but its adoption was never a foregone conclusion, and it would be inaccurate to suggest that all Germans thought this way, even during

²¹ Encouraged by the founding of the German Empire in 1871, this tendency was firmly in place by World War I at the latest. Sybilla Nikolow, “Statistische Bilder der Bevölkerung in den großen Hygieneausstellungen als Wissensobjekte,” in *Das Konstrukt “Bevölkerung” vor, im und nach dem “Dritten Reich”*, ed. Rainer Mackensen and Jürgen Reulecke, 476-488 (Wiesbaden: Verlag für Sozialwissenschaften, 2005), 481.

²² Paul Weindling, *Health, Race, and German Politics between National Unification and Nazism, 1870-1945* (Cambridge: Cambridge University Press, 1989); Robert Proctor, *Racial Hygiene: Medicine under the Nazis* (Cambridge, MA: Harvard University Press, 1988).

²³ On collectivist politics, Geoffrey Campbell Cocks, *The State of Health: Illness in Nazi Germany* (Oxford: Oxford University Press, 2012), 4-7; Thomas Kühne, *Belonging and Genocide: Hitler's Community, 1918-1945* (New Haven: Yale University Press, 2010), 22-26. For a thoughtful corrective away from a stark individualism-collectivism dichotomy, see Moritz Föllmer, “Was Nazism Collectivistic? Redefining the Individual in Berlin, 1930-1945,” *Journal of Modern History* 82, no. 1 (March 2010): 61-100.

its high point from the late 1920s to the 1940s.

In this study, I use the words “telescope” and “telescopic” in two ways. The first considers the differing functions of instruments with lenses; the second (covered below) involves the relationship of the parts to the whole. We begin with microscopes and telescopes, two scientific tools used to enhance the capabilities of human eyes. This is an optical model that relies on zooming, scales, and magnification (“levels”). Mentally traveling from the lowest magnification (largest objects) of the telescopic body to the highest magnification (smallest objects) involves changing scales much like the camera that zooms from far outer space to human-scale vision and continues down to a quark in an atom in a man’s hand in the Charles and Ray Eames film *Powers of Ten* (1977).²⁴ On the one hand, a microscope makes what is small bigger: cells that cannot be seen with the naked human eye can be perceived with the aid of two convex lenses and some training about what is being seen. We could say that public health educators used a “microscopic perspective” to explain to Germans that the food they interacted with on a macroscopic level (a bushel of wheat, a side of bacon, an apple) interacted with their bodies on a microscopic level through digestion and absorption. But what could an analogy with a microscope tell us about larger “objects,” such social groups?

On the other hand, a telescope brings what is far away closer; it bridges the gap between a single seeing individual and objects removed by a great distance, such as stars. Whereas very small things like cells and protein molecules are not perceptible without the aid of a microscope,

²⁴ Charles Eames and Ray Eames, *Powers of Ten* (Santa Monica, CA: Pyramid Films, 1977), 9:01 mins., available online at Powers of Ten, <http://www.powersof10.com/film>; Philip Morrison and Phylis Morrison, *Powers of Ten: A Book about the Relative Size of Things in the Universe and the Effect of Adding Another Zero* (New York: Scientific American Library, 1982). Both film and book were based in part on Kees Boeke, *Cosmic View: The Universe in 40 Jumps* (New York: J. Day, 1957). On the film see also Michael J. Golec, “Optical Constancy, Discontinuity, and Non-discontinuity in the Eameses’ *Rough Sketch*,” in *The Educated Eye: Visual Culture and Pedagogy in the Life Sciences*, ed. Nancy Anderson and Michael R. Dietrich, 162-185 (Hanover, NH: Dartmouth College Press, 2012). On zooming in scientific films about bodies, see Dirk Verdicchio, “Vom Aussen ins Innere (und wieder zurück). Medialisierung von Wissenschaft in Filmen über den Körper,” *Historische Anthropologie* 16, no. 1 (2008): 55-73.

a (bio)chemical reaction, or some other mediating technology, the light of a single star, even though light-years away, is still perceptible to the unenhanced human eye due to its enormous size. The sheer scale of the modern state likewise made itself perceptible to individuals even without effort: through taxes, workplace or housing regulations, a police presence, mandatory military service, etc. Indeed, the telescopic perspective inculcated by state-run education and other tools of nationalism encouraged the observing individual to draw the state closer, to make its appearance larger, through the adoption of certain rituals (i.e. displaying a flag), espousal of patriotic sentiments, and participation in national holidays.²⁵ Similarly, over the course of the early 1900s—and especially after World War I—existential fears about the German collective (whether defined as nation or race) encouraged both public and private organizations to make the quality and quantity of food on citizens’ tables into a sinew connecting them as an organic unit that ate, drank, reproduced, got sick, and was threatened with death. They imagined themselves as a collective that ate and drank alike—or one that should, if everyone followed the same advice about nutrition.²⁶

For simplicity’s sake and because of the second meaning of “telescopic” that I will describe now, I have chosen to use one term for the whole spectrum of seeing and relating. Another way to understand the telescopic concept refers to how the “layers” of this segmented social organism fit into each other like the segments of a telescope: cell, tissue, organ system, individual, community, state.²⁷ Think of a collapsible travel cup or of Russian nesting dolls: each succeeding segment is larger or smaller than the preceding one, depending on which direction in

²⁵ Eric J. Hobsbawm and Terence O. Ranger, eds., *The Invention of Tradition* (Cambridge: Cambridge University Press, 1983).

²⁶ Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso Editions/NLB, 1983).

²⁷ For a politico-spatial analysis of this sequence, Neil Smith, “Contours of a Spatialized Politics: Homeless Vehicles and the Production of Geographical Scale,” *Social Text* no. 33 (1992): 54-81, esp. 66-77.

the sequence one travels. If one considers numbers instead of size, then the (eating and drinking) individual is the single node or fulcrum from which spread an exponentially increasing number of nodes in either direction: one human being; a dozen organ systems; hundreds of bones, muscles, and other body parts; and trillions of cells. And in the other direction: one human being who belongs to multiple, overlapping social and political groups (families, communities, political parties, religions, nation-states, etc.) all the way up to the human race. The “nodes” need not be thought of as discrete units with definite boundaries but rather as stopping points along a continuum whose defining principle is sequential connectivity. The chapters of my dissertation sample this continuum at familiar nodes: at the level of molecules or of meals or of national politics. Each one reveals something different about Germans’ experiences of their eating, drinking, and digesting bodies.

If one imagines that the telescopic body extends “upwards” and “downwards” from a central individual, then the advertising passage above easily reproduces the upper half of this structure: at the top of the paragraph stands the collective level of “the whole German people” (*das ganze Volk*, a patriotic but fairly politically neutral term). At the bottom of the paragraph stands the individual level of “you, who and whatever you are.” Between this familiar dichotomy of society and person, nation and individual, state and citizen lie various social and professional groups that had an interest in the nutrition and foodways of Germans. The chapters that follow are filled with representatives from these intermediate layers: nutritionists and healers of various persuasions, home economics teachers, farmers, housewives and paterfamilias, civil servants, industrialists and the food chemists who monitored their wares, and the advertisers who hawked them. Note that there is no single path to follow from cell through individual to collective(s). One could tunnel downward from the individual along any organ system to any hypothetical cell.

Similarly, one could go upward to any social group suggested by the primary sources. For instance, the German left and center favored *das Volk* (the people, the nation), while the right were more likely to use race or *Volkskörper* (“the body of the people”).²⁸ This flexibility is one of the strengths of the telescopic perspective.

Less obvious from the flier but central to the German Hygiene Museum’s contribution to the “Nutrition” exhibition were the layers telescoping “down” from the eating individual: the anatomy and physiology of the digestive system, the structure and function of cells, and finally the macromolecules and micronutrients that make up foods. Martin Vogel wrote of the museum’s re-vamped display “that man in his bodily and mental entirety is still ‘the measure of all things’” and that “without knowledge of the human body and its ways, this central problem of health [e.g. nutrition] cannot be made comprehensible.”²⁹ Because of the interdependent nature of the parts of this telescoped or telescopic body, reformers interested in the condition of *das Volk* could reduce their social, political, and physiological arguments to macromolecules and their calorific, digestive, or nutritional properties. With this framework, nutritionists could make basic science knowledge applicable to an entire population of eating and digesting individuals.

Bodily metaphors

Early twentieth-century Germans are hardly the first to have used bodily metaphors to understand themselves as part of something bigger. A. D. Harvey has brilliantly shown how “the body politic” (and its application to warfare) has continuously evolved to reflect contemporary

²⁸ Thorsten Halling, Julia Schafer, and Jörg Vögele, “Volk, Volkskörper, Volkswirtschaft—Bevölkerungsfragen in Forschung und Lehre von Nationalökonomie und Medizin,” in *Das Konstrukt “Bevölkerung” vor, im und nach dem “Dritten Reich”*, ed. Rainer Mackensen and Jürgen Reulecke, 388-428 (Wiesbaden: Verlag für Sozialwissenschaften, 2005), 399-402; Thomas Raithel, *Das schwierige Spiel des Parlamentarismus: Deutscher Reichstag und französische Chambre des Députés in den Inflationskrisen der 1920er Jahre* (Munich: R. Oldenbourg, 2005), 87-88.

²⁹ Martin Vogel: “daß der Mensch in seiner körperlich-seelischen Gesamtheit doch immer wieder ‘das Maß aller Dinge’ ist” and that “ohne Kenntnis des Menschenleibes und seines Wesens ist gerade dieses Hauptproblem der Gesundheitspflege [der Ernährung] gar nicht verständlich zu machen.” In *Die Ernährung: Ausstellung für gesunde und zweckmässige Ernährung*, ed. Presse- u. Werbe Abteilung des Ausstellungs-, Messe- und Fremdenverkehrsamtes der Stadt Berlin (Berlin: Gersbach & Sohn, 1928), 78.

society and science. Whereas in the religious text of the *Rig-Veda* (c. 1900 BCE) the priests serve as the mouth of the collective body, in a political philosophy text like Plato's *Republic* (c. 380 BCE) the rulers are the head, the soldiers the arms, and the laborers the feet. A hierarchical body with many members appears frequently in ancient and medieval writings.³⁰

By the early modern period with its (proto)industrialization, biological metaphors competed with mechanical ones. The most famous early modern body-state metaphor, from Thomas Hobbes's *Leviathan* (1561), exemplifies this tension. As Abraham Bosse depicted so memorably on the book's frontispiece, the state is represented by the monarch, whose body is composed of his many subjects, who consent to the social contract. Though Bosse and Hobbes consulted on the image, it bears little resemblance to the text, which uses the decidedly more mechanical language of the state as an automaton.³¹ Interestingly, although the *Leviathan* shares with the "body of many parts" concept a unique, agentic head above the rest, the mass of his body is less like the differentiated professional classes composing the arms, trunk, and legs than like the identical members of Rudolf Virchow's democratic cell-state (*der Zellenstaat*, 1850s), whose citizens all have an equal stake in the functioning of the body-state.³² In their biological and political writings, Virchow (1821-1902) and his student Ernst Haeckel (1834-1919) emphasized the priority of the individuals without whom the whole could not exist. German-language authors like these and Swiss sociologist Johann Kaspar Bluntschli (1808-1881) reinvigorated biological metaphors and kept them current in a century marked by technological

³⁰ A. D. Harvey, "The Body Politic: Anatomy of a Metaphor," *Contemporary Review* 275, no. 1603 (Aug. 1999): 85-93 and *Body Politic: Political Metaphor and Political Violence* (Newcastle, U.K.: Cambridge Scholars Publishing, 2007). See also Ernst Hartwig Kantorowicz, *The King's Two Bodies: A Study in Mediaeval Political Theology* (Princeton: Princeton University Press, 1997, 1957); Jonathan Gil Harris, *Foreign Bodies and the Body Politic: Discourses of Social Pathology in Early Modern England* (Cambridge: Cambridge University Press, 1998).

³¹ Harvey, *The Body Politic*, 35.

³² Andrew Reynolds, "The Theory of the Cell State and the Question of Cell Autonomy in Nineteenth and Early Twentieth-Century Biology," *Science in Context* 20, no. 1 (2007): 71-95; Paul Weindling, "Theories of the Cell State in Imperial Germany," in *Biology, Medicine and Society, 1840-1940*, ed. Charles Webster, 99-155 (New York: Cambridge University Press, 1981).

progress and machine metaphors.³³

A different metaphor that circulated from the ancient through the early modern West is the philosophy of the macrocosm and the microcosm. It bespeaks the perfection of creation and the repetition of patterns in the largest as in the smallest things. English poet-cleric John Donne repeatedly compared body parts to familiar natural and human-made formations in his *Devotions* (1624): “If all the veins in our bodies were extended to rivers, and all the sinews to veins of mines, and all the muscles that lie upon one another, to hills, and all the bones to quarries of stones ... the air would be too little for this orb of man to move in.”³⁴ The idea that each human being is “a little world” highlights size as a characteristic, with the objects of comparison in this model being copies of each other but at different scales. Microcosm-macrocosm thinking persisted into the twentieth century in the worldview of the “life reform movement” (*Lebensreformbewegung*), which encompassed the whole organism, its mind (or soul), and the environment.³⁵

The telescopic perspective combined the holism of the natural health and life reform movements with the anatomo-physiological approach of scientific medicine to produce a modern, scientized way of thinking about the relation of the individual to him- or herself and to society (sometimes represented by the state). Although the term originates with me, it is based on close readings of early twentieth-century German sources. Like the macrocosm-microcosm

³³ Harvey, *The Body Politic*, 61-62. See e.g. Philipp Sarasin, *Reizbare Maschinen: eine Geschichte des Körpers 1765-1914* (Frankfurt am Main: Suhrkamp Verlag, 2011); Laura Otis, *Networking: Communicating with Bodies and Machines in the Nineteenth Century* (Ann Arbor: University of Michigan Press, 2001); Mary Poovey, *Making a Social Body: British Cultural Formation, 1830-64* (Chicago: University of Chicago Press, 1995). On food as fuel for the mechanical body: Joyce L. Huff, “Corporeal Economies: Work and Waste in Nineteenth-Century Constructions of Alimentation,” in *Cultures of the Abdomen: Diet, Digestion, and Fat in the Modern World*, ed. Christopher E. Forth and Ana Carden-Coyne, 31-50 (New York: Palgrave MacMillan, 2005); Philipp Dietrich Milles, “Working Capacity and Calorie Consumption: The History of Rational Physical Economy,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 75-96 (Atlanta: Rodopi, 1995).

³⁴ John Donne, *John Donne's Devotions upon Emergent Occasions. Together with Death's Duel* (Ann Arbor: University of Michigan Press, 1959, 1624), 23. For more on “man” as a graphical microcosm, see 8-9, 50, 108. See also Kim Sawchuk, “Biotourism, *Fantastic Voyage*, and Sublime Inner Space,” in *Wild Science: Reading Feminism, Medicine and the Media*, ed. Janine Marchessault and Kim Sawchuk, 9-23 (New York: Routledge, 2000), 9-11.

³⁵ Florentine Fritzen, *Gesünder Leben: Die Lebensreformbewegung im 20. Jahrhundert* (Stuttgart: Franz Steiner, 2006), 283-294. She discusses microcosm-macrocosm with (Virchow's) cell state and Haeckel's ontology theories.

schema, it is scalar and encompasses many layers of abstraction. Unlike the cell-state theory, the telescopic body considers not just individuals and the state but the intermediary levels “above” the eating and perceiving individual (family, food chain) and “below” (anatomy, physiology, biochemistry).³⁶ Like the body with many members its parts are different from each other, but they telescope into each other rather than fitting together at the same level of magnification: nations are collections of families that consist of many members, whose bodies contain multiple organs made of tissues and cells, which are constructed from molecules.

On the health of individual and social bodies

The pamphlet for the 1928 “Nutrition” exhibition further justified the need for this “100-days show” by appealing to the anxiety that modern life caused: “Lastly, there is also the increased tension of the population in our age of technology and commerce, the increased demands placed on the physical strength and nerves of each individual.”³⁷ Sociologist Georg Simmel (1858-1918) had famously captured these sentiments in a lecture he gave at the 1903 German Cities Expo (*Deutsche Städteausstellung*)—about which more later. Simmel described how the excess of nervous stimuli in a typical modern metropolis encouraged both an intellectualization of the individual psyche and a blasé attitude toward the sights, sounds, and other sensory experiences of an urban environment.³⁸ Commentators frequently faulted the physiological and psychological stresses on urban and industrialized bodies for “diseases of

³⁶ Jonathan Sawday, *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture* (London: Routledge, 1995); Soraya de Chadarevian and Harmke Kamminga, eds., *Molecularizing Biology and Medicine: New Practices and Alliances, 1910s-1970s* (Amsterdam: Harwood Academic Publishers, 1998); Suzanne Anker and Dorothy Nelkin, *The Molecular Gaze: Art in the Genetic Age* (Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2004).

³⁷ “Zuletzt ist es aber auch die gesteigerte Anspannung des Menschen in unserer Zeit der Technik und des Verkehrs, die erhöhte Forderungen an die physischen Kräfte und an die Nerven jedes einzelnen [ge]stellt.” Page 1, doc. 3, Nr. 558 “Die Ernährung” Berlin 1928, 11168 MfW, SHAD.

³⁸ Georg Simmel, “The Metropolis and Mental Life,” in *The Blackwell City Reader*, ed. Gary Bridge and Sophie Watson, 11-19 (Malden, MA: Wiley-Blackwell, 2002).

civilization” like neurasthenia, gout, obesity, diabetes, degeneracy, and alcoholism.³⁹ And it simultaneously seemed that cities were overcrowded even while national birthrates dropped.⁴⁰

In modernizing nations from America to Britain to China, the field of public health developed along with industrialization and urbanization to mitigate obstacles to progress such as degeneracy.⁴¹ During the eighteenth century, emerging European states had begun to monitor their populations in order to assess military and economic strength.⁴² This surveillance developed over the nineteenth century into statistics for tracking individual life events on the regional or national level (i.e. births, marriages, deaths).⁴³ Large-scale projects for sewers, water treatment and canalization, and urban planning changed the physical environment, while quarantines, building codes, home inspections, and registration of prostitutes shaped the ways in which individuals interacted with their surroundings.⁴⁴ School and military physicals, vaccination, and educational campaigns made the control of spaces, goods, and bodies ever more intimate, as

³⁹ “The world of civilization is an immense hospital-ward, the air is filled with groans and lamentations, and every form of suffering is to be seen twisting and turning on the beds.” Max Simon Nordau, *The Conventional Lies of Our Civilization* (Chicago: L. Schick, 1884), 1; orig. pub. as *Die Conventionalen Lügen der Kulturmenschheit* (Leipzig: B. Schlicke, 1883). See e.g. Stephen Kern, *The Culture of Time and Space, 1880-1918* (Cambridge, MA: Harvard University Press, 2003, 1983), 124-127; Daniel Pick, *Faces of Degeneration: A European Disorder, c. 1848-1918* (Cambridge: Cambridge University Press, 1993).

⁴⁰ Weindling, *Health, Race, and German Politics*, 11-25; Joshua Cole, *The Power of Large Numbers: Population, Politics, and Gender in Nineteenth-Century France* (Ithaca: Cornell University Press, 2000), esp. 1-5.

⁴¹ Martin V. Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000); Dorothy Porter, *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times* (London: Routledge, 1999); Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004).

⁴² George Rosen, *A History of Public Health* (Baltimore: Johns Hopkins University Press, 1993, 1958); *ibid.*, “The Fate of the Concept of Medical Police 1780-1890,” *Centaurus* 5, no. 2 (June 1957): 97-113 and repub. in *Centaurus* 50, no. 1/2 (Jan. 2008): 46-62 with commentaries by Christopher Hamlin, 63-69, and Michael Knipper, 70-72; George Steinmetz, *Regulating the Social: The Welfare State and Local Politics in Imperial Germany* (Princeton: Princeton University Press, 1993).

⁴³ William Coleman, *Death Is a Social Disease: Public Health and Political Economy in Early Industrial France* (Madison: University of Wisconsin Press, 1982); Cole, *The Power of Large Numbers*; Sybilla Nikolow, “Imaginäre Gemeinschaften. Statistische Bilder der Bevölkerung,” in *Konstruierte Sichtbarkeiten: Wissenschafts- und Technikbilder seit der Frühen Neuzeit*, ed. Martina Heßler, 263-278 (München: Wilhelm Fink, 2006); and *ibid.*, “Die graphisch-statistische Darstellung der Bevölkerung: Bevölkerungskonzepte in der Gesundheitsaufklärung in Deutschland vor 1933,” in *Bevölkerungslehre und Bevölkerungspolitik vor 1933*, ed. Rainer Mackensen, 297-314 (Oplade: Leske + Budrich, 2002).

⁴⁴ From barricades to Hausmannization, the classic case is Paris. David Harvey, *Paris, Capital of Modernity* (New York: Routledge, 2003.)

laypeople absorbed both the new scientific information and the techniques of biopower that increasingly drove relations between and among citizens and states.⁴⁵

State-sponsored public health was supplemented by private individuals and organization invested in the curing of social ills. In Germany the most well-known of these was the life reform movement, a loosely organized concatenation of naturists, vegetarians, nudists, and naturopaths.⁴⁶ Some claimed to have found a more “scientific” way to live, while others rejected anything that smacked of pharmaceuticals and vivisection, but they all agreed that modern life was making both individuals and society sick. In many other countries, such “faddists” remained on the cultural fringe, but in Germany their ideas were available in popular publications, consumer goods, and sanatoriums. Their influence as a discrete movement peaked in the 1920s, before being co-opted by the National Socialists and then mainstreamed by post-war consumer and environmental movements. Both “reform” diets and a rationalized, scientific diet like that promoted in Berlin in 1928 were part of the public dialogue on health in modern Germany.⁴⁷

Two conceptual changes occurred in body concepts over this time span.⁴⁸ First, historians have identified a general trend from the eighteenth to the twentieth century in which “traditional” systems of personal hygiene were gradually replaced by self-consciously “modern” systems of personal comportment and social welfare. Since the mid-1700s, the white Euro-American bourgeoisie in particular had sought to fashion themselves as individual subjects through such

⁴⁵ Philipp Sarasin and Jakob Tanner, eds., *Physiologie und industrielle Gesellschaft: Studien zur Verwissenschaftlichung des Körpers im 19. und 20. Jahrhundert* (Frankfurt am Main: Suhrkamp Verlag, 1998); Michel Foucault, *Discipline and Punish*, trans. Alan Sheridan (New York: Pantheon, 1977); *ibid.*, *History of Sexuality*, trans. Robert Hurley, 3 vol.s (New York: Pantheon Books, 1978-1986).

⁴⁶ Fritzen, *Gesünder Leben*; Eva Barlösius, *Naturgemässe Lebensführung: zur Geschichte der Lebensreform um die Jahrhundertwende* (Frankfurt am Main: Campus Verlag, 1997); Judith Baumgartner, *Ernährungsreform—Antwort auf Industrialisierung und Ernährungswandel. Ernährungsreform als Teil der Lebensreformbewegung am Beispiel der Siedlung und des Unternehmens Eden seit 1893* (Frankfurt am Main: Peter Lang, 1992).

⁴⁷ E.g. Alain Drouard, “Reforming Diet at the End of the Nineteenth Century in Europe,” in *Food and the City in Europe since 1800*, ed. P. J. Atkins, Peter Lummel, and Derek J. Oddy, 215-226 (Aldershot, Eng.: Ashgate, 2007); L. Margaret Barnett, “‘Every Man His Own Physician’: Dietetic Fads, 1890-1914,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 155-178 (Atlanta: Rodopi, 1995).

⁴⁸ Sarasin, *Reizbare Maschinen*; Rogaski, *Hygienic Modernity*.

bodily practices as regular bathing, exercise, table manners, and avoidance of bodily “wastes” like sputum and feces.⁴⁹ As with its ancient and humoral counterpart, this personal hygiene required “care of the self”; but the self was less constitutional than classed, gendered, and increasingly commercialized.⁵⁰ Then, in the second half of the long nineteenth century—and especially between 1900 and World War I—crises of war stimulated policy makers and reformers in numerous countries to concentrate on regenerating the social body for strength and fertility through urban sanitation, eugenics campaigns, and educational spectacles like “Nutrition.”⁵¹ This is when in Germany the metaphor of the “body of the people” (*der Volkskörper*) began to gain widespread traction as a way of explaining the importance of individual health for collective well-being.⁵² At the anthropomorphic extreme, the German people could be imagined as an entity that reproduced, got sick, and died.⁵³ I offer “the telescopic body” as a name for the mental framework that was necessary to connect individual

⁴⁹ Norbert Elias, *The Civilizing Process* (Oxford: Basil Blackwell, 1978); orig. pub. as *Über den Prozess der Zivilisation. Soziogenetische und psychogenetische Untersuchungen*, 2. Aufl. (Bern: Francke, 1969).

⁵⁰ Fritzen, *Gesünder Leben*; Foucault, *The History of Sexuality*, vol. 3: *The Care of the Self*, trans. Robert Hurley (New York: Pantheon Books, 1986). Led by Ludolf von Krehl, Friedrich Kraus, Ernst Kretschmer, etc., there was a revival of holistic, neoconstitutional medicine among some German physicians: Michael Hau, “The Holistic Gaze in German Medicine, 1890-1930,” *Bulletin of the History of Medicine* 74 (2000): 495-524; “Zum Gedanken an Ludolf Krehl.—Seine Schüler,” *MmW* 103, no. 51 (22 Dec. 1961): 2489-2498.

⁵¹ Michael Anton Budd, *The Sculpture Machine: Physical Culture and Body Politics in the Age of Empire* (New York: New York University Press, 1997), 21-22; Rogaski, *Hygienic Modernity*; Sarasin, *Reizbare Maschinen*. Precise dates for the switch from individual to social hygiene vary by country: Budd suggests the Crimean War (1853-1856) was formative in Britain; Rogaski points to the Second Opium War (1900-1902) in China; and Sarasin cites World War I (1914-1918) in Western Europe. In *Making a Social Body*, Mary Poovey finds a conceptual shift among elite British reformers in the debates around pauperism and the New Poor Law (1834), while Anna Davin’s analysis coalesces around empire and eugenics starting in the 1890s; see “Imperialism and Motherhood,” *History Workshop* 5 (Spring 1978): 9-65. Paul Weindling suggests that Germany’s discussion began in the 1880s, solidified with World War I, and was enacted from the 1920s to the 1940s; see *Health, Race and German Politics*, 158, 283, 291-293.

⁵² Peter Walkenhorst, *Nation-Volk-Rasse: Radikaler Nationalismus im Deutschen Kaiserreich 1890-1914* (Göttingen: Vandenhoeck & Ruprecht, 2007), esp. 80-165; Halling, Schafer, and Vögele, “Volk, Volkskörper, Volkswirtschaft.” And in France: Susanne Michl, *Im Dienste des ‘Volkskörpers’: Deutsche und Französische Ärzte im Ersten Weltkrieg* (Göttingen: Vandenhoeck & Ruprecht, 2007).

⁵³ Moritz Föllmer, “Der ‘kranke Volkskörper’. Industrielle, hohe Beamte und der Diskurs der nationalen Regeneration in der Weimarer Republik,” *Geschichte und Gesellschaft* 27, no. 1 (2001): 41-68; Thomas Bryant, “Der deutsche ‘Volkskörper’ im Spannungsfeld zwischen ‘Volksgeundheit’ und ‘Volkskrankheit’—Bevölkerungswissenschaftliche Pathologisierungspfadparadigmen und biopolitische Medikalierungsstrategien zur demographischen Alterung im 20. Jahrhundert,” in *Virus: Beiträge zur Sozialgeschichte der Medizin*, ed. Carlos Watzka, Elisabeth Dietrich-Daum, and Andreas Golob, 11-24 (Vienna: Verlagshaus der Ärzte, 2010).

bodies to the social body.

At first glance, the telescopic perspective is very “German.” “If . . . thinking hierarchically was every German’s second nature, then thinking communally may have been his first,” writes one historian, and the telescopic body is nothing if not communal and hierarchical.⁵⁴ Germany was one of the earliest countries to develop both the scientific knowledge and the philosophy required for the telescopic perspective, and it exported its advances in nutritional physiology and bacteriology, as well as technical knowledge in organization and engineering, to Britain, the United States, Japan, and elsewhere.⁵⁵ Many Germans evinced particularly strong and organic conceptions of the social and political life of *das Volk* rooted in the land and soil, in the inheritance of organic memory, in dedication to connections between individual bodies and collective health (e.g. eugenics), and in notions of individual and collective purity-cum-cleanliness (e.g. racial hygiene).⁵⁶ But Germans were not the only population to experiment with biologized collectivism. While my dissertation describes experiences of eating and drinking in a particular time and place, the theory of the telescopic perspective could be applied to other (bio)medicalizing Western societies, as long as the primary sources bear this out.⁵⁷

⁵⁴ Margaret Lavinia Anderson, *Practicing Democracy: Elections and Political Culture in Imperial Germany* (Princeton: Princeton University Press, 2000), 36. See also Hugo Münsterberg, “The New Idealism,” in *Tomorrow. Letters to a Friend in Germany* (New York: D. Appleton, 1916), 110-137.

⁵⁵ On nutrition, Justus Liebig and John Gardner, *Familiar Letters on Chemistry, and its Relation to Commerce, Physiology and Agriculture* (New York: J. Winchester, 1843); Hamilton Cravens, “The German-American Science of Racial Nutrition, 1870-1920,” in *Technical Knowledge in American Culture: Science, Technology, and Medicine since the Early 1800s*, ed. Cravens, Alan I. Marcus, and David M. Katzman, 125-145 (Tuscaloosa: University of Alabama Press, 1996); on medical education, Thomas Neville Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945* (New York: Oxford University Press, 1995); on public health, Rogaski, *Hygienic Modernity*.

⁵⁶ Laura Otis, *Organic Memory: History and the Body in the Late Nineteenth and Early Twentieth Centuries* (Lincoln: University of Nebraska Press, 1994); Weindling, *Health, Race, and German Politics*; Robert Proctor, *Racial Hygiene: Medicine under the Nazis* (Cambridge, MA: Harvard University Press, 1988), 221-222, 489-564.

⁵⁷ Adele E. Clarke, Janet Shim, Laura Mamo, Jennifer Fosket, and Jennifer Fishman, eds., *Biomedicalization: Technoscience and Transformations of Health and Illness in the U.S.* (Durham, NC: Duke University Press, 2009); Nikolas Rose and Carlos Novas, “Biological Citizenship,” in *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, ed. Aihwa Ong and Stephen Collier, 439-463 (Malden, MA: Blackwell, 2003); Nikolas Rose, *The Politics of Life Itself: Biomedicine, Power and Subjectivity in the Twenty-First Century* (Princeton: Princeton University Press, 2007); Peter Conrad, *The Medicalization of Society: On the Transformation*

Finally, I would like to suggest that the narrative of “the rise of medicine” that numerous scholars have identified for the long nineteenth century was already “biomedical” by the late 1800s in so far as it incorporated both super-individual concerns (social reform, public health) and sub-individual ones (physiology, bacteriology, biochemistry). Put another way, modern, scientific medicine introduced scalar thinking by multiplying and linking the sites of investigation and control, from the constitutive parts of the individual subject of personal hygiene (nutrients, hormones, cells, organs) to the collective subjects of public health (family, city, nation). Simmel made another observation pertinent to this discussion. He noted that just as a modern city extends beyond its cartographic boundaries through the movement of people, goods, money, and ideas, so “a person does not end with the limits of his physical body or with the area to which his physical activity is immediately confined but embraces, rather, the totality of meaningful effects which emanates from him temporally and spatially.”⁵⁸ This sentiment is entirely compatible with the telescopic body I am proposing.

The politics of the table

Despite the population growth and urbanization that caused such anxiety, concomitant modernization of the food supply prevented the realization of Malthusian predictions of competition over scarce food resources during peacetime.⁵⁹ Historians write of a triple revolution in food provision over the nineteenth century: first, new agricultural production techniques such as artificial fertilizers, more sophisticated crop rotation, and mechanical implements for milking,

of Human Conditions into Treatable Disorders (Baltimore: Johns Hopkins University Press, 2007); Keith Wailoo, “Sovereignty and Science: Revisiting the Role of Science in the Construction and Erosion of Medical Dominance,” *Journal of Health Politics, Policy and Law* 29, no. 4-5 (Aug.-Oct. 2004): 643-659.

⁵⁸ Simmel, “The Metropolis and Mental Life,” 17.

⁵⁹ Michael Kopsidis, “Produktmärkte und Agrarentwicklung 1750 bis 1880. Die letzte Phase vorindustrieller Agrarentwicklung als erste Phase des säkularen Landwirtschaftlichen Wachstums der Neuzeit und Moderne? Implikationen für Sachsen,” in *UnGleichzeitigkeiten: Transformationsprozesse in der ländlichen Gesellschaft der (Vor-)Moderne*, ed. Ira Spieker, Elke Schlenkrich, Johannes Moser, and Martina Schattkowsky, 61-76 (Dresden: Thelem, 2008), 65. Kopsidis argues that until about 1880, the agricultural revolution depended less on industrialization than on landholders and laborers working together to maximize traditional knowledges and technologies.

threshing, etc., increased yields.⁶⁰ Second, more widespread and reliable transportation networks (especially railroads and steamships) delivered goods to market more quickly and over longer distances. For instance, only in the 1880s could most Germans purchase fresh, unspoiled salt-water fish from a local shop. In fact, the empire imported not only finished goods like canned meat and tropical fruits (*Südfrüchte*) but also much of the fertilizer and animal fodder that sustained its own agricultural production.⁶¹ Furthermore, both better transportation and the third key development—new means of conservation that included canning and refrigeration—reduced seasonality and decreased susceptibility to famine from failed crops.⁶²

Hans Jürgen Teuteberg explains that “until the founding of the Bismarck-Empire [in 1871], the majority of Germans lived in the countryside or in small towns and consumed what they had produced at home.”⁶³ Industrialization had taken in the middle of the century, especially in Saxony, and by the early decades of the 1900s, most Germans lived in cities.⁶⁴ Urban-to-rural migration reduced both Germans’ access to the means of food production and the amount of time

⁶⁰ Hans Jürgen Teuteberg, “Urbanization and Nutrition: Historical Research Reconsidered,” in *Food and the City in Europe since 1800*, ed. P. J. Atkins, Peter Lummel, and Derek J. Oddy, 13-24 (Aldershot, Eng.: Ashgate, 2007); *ibid.*, “Die tägliche Kost unter dem Einfluß der Industrialisierung,” in Teuteberg and Günter Wiegelmann, *Unsere tägliche Kost: Geschichte und regionale Prägung*, 345-362 (Münster: F. Coppenrath, 1986), 355-356; and several contributions to Edith Heischkel-Artelt, ed., *Ernährung und Ernährungslehre im 19. Jahrhundert. Vorträge eines Symposium am 5. und 6. Januar 1973 in Frankfurt am Main* (Göttingen: Vandenhoeck & Ruprecht, 1976).

⁶¹ Before World War I, Germany imported 2 billion Marks’ worth of food and 1.25 billion Marks’ worth of fodder, with which it produced a further 2 billion Marks’ worth of food. Meanwhile, it exported .75 billion Marks’ worth of food, for a trade deficit of 2 billion Marks. Adam Stegerwald, “Zur Schwer- und Schwerstarbeiter-Versorgung mit Zusatz-lebensmitteln,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 26/27: Die Schwerarbeiterfrage, 1-10 (Berlin: Reimar Hobbing, early Dec. 1917), 1.

⁶² For an excellent overview, see Uwe Spiekermann, “Science, Fruits, and Vegetables: A Case Study on the Interaction of Knowledge and Consumption in Nineteenth- and Twentieth-Century Germany,” in *Decoding Modern Consumer Societies*, ed. Hartmut Berghoff and Uwe Spiekermann, 229-248 (New York: Palgrave Macmillan, 2012).

⁶³ “Bis zur Gründung des Bismarck-Reiches hat die Mehrzahl der Deutschen, die ja auf dem Lande oder in Kleinstädten lebte, in der Hauptsache das verzehrt, was man in der eignen Hauswirtschaft produzierte.” Teuteberg, “Die tägliche Kost unter dem Einfluß der Industrialisierung,” 357.

⁶⁴ In 1875, 61% of the German population lived in rural areas with fewer than 2,000 inhabitants; by 1910, that figure had sunk to 40%. In 1875, about 6% of Germans lived in one of the 12 large cities (*Großstädte*) that counted at least 100,000 residents; by 1910, those numbers had grown to 48 large cities and fully one fifth (21%) of the population. Urbanization was even more pronounced in Saxony, where 58% of the population lived in rural communities in 1875, but only 27% did by 1910. One third (32%) of Saxons lived in one of the 4 large cities in the kingdom in 1910 (Dresden, Leipzig, Chemnitz, Zwickau). Kaiserliches Statistisches Amt, *Statistisches Jahrbuch für das Deutsche Reich*, 1 Jhrg. (Berlin: Puttkammer & Mühlbrecht, 1881), 6-7; *Statistisches Jahrbuch für das Deutsche Reich*, 34. Jhrg. (Berlin: Puttkammer & Mühlbrecht, 1914), 4-5.

required to plan meals and acquire their components. Still, not all city slickers depended entirely on the market for all their food needs. Some middle-class families owned lots big enough on which to keep a vegetable garden and a potato patch, and they might board a pig with a farmer.⁶⁵ As the Schreber garden movement spread from Leipzig in the second half of the century, the lower-middle- and working-classes could rent small plots of land at the edge of the city or along the railroad tracks on which to grow some of their own food.⁶⁶ Although noodles, sausages, and soup and spice mixes from Knorr (est. 1838), Liebig (est. 1862), and Maggi (est. 1890) were available at the beginning of this period, housewives had to prepare their own mustards, mayonnaises, sauces, and salad dressings with recipes from cookbooks like Henriette Davidis'.⁶⁷ Especially after the introduction of Rex and Weck glass home "canning" sets, many middle-class women "put up" produce they had grown or purchased in late summer and early fall.⁶⁸ But the majority of urban residents had neither the land nor the storage space, neither the capital nor the time to produce food for their own use and were relegated to the position of absolute consumers of foodstuffs.

By 1900 the (urban) poor ate a better diet than their counterparts did a century earlier, but it was not as rich and varied as the meals served in restaurants and middle-class homes. By and large they could only afford cheaper substitutes: margarine instead of butter, chicory instead of

⁶⁵ Wiedemann, *Herrin im Hause*, 64-69.

⁶⁶ Hartwig Stein, *Inseln im Häusermeer: eine Kulturgeschichte des deutschen Kleingartenwesens bis zum Ende des Zweiten Weltkriegs. Reichsweite Tendenzen und Groß-Hamburger Entwicklung*, 2. Aufl. (Frankfurt am Main: Lang, 2000), esp. 2.2 and Chapter 5.

⁶⁷ Eva Blimlinger, "Wenn es um die Wurst geht..." in *Erfahrung der Moderne*, ed. Michael Pammer, Herta Neiß, and Michael John, 385-402 (Stuttgart: Franz Steiner, 2007); Kirsten Schlegel-Matthies, "'Liebe geht durch den Magen': Mahlzeit und Familienglück im Strom der Zeit," in *Revolution am Esstisch. Neue Studien zur Nahrungskultur im 19./20. Jahrhundert*, ed. Hans Jürgen Teuteberg, 148-161 (Stuttgart: Franz Steiner, 2004), 153-154; *ibid.*, "Zum Wandel der Esskultur in Deutschland," in *Ernährungskultur im Wandel der Zeiten*, ed. Katalyse e. V. and Buntstift e. V., 11-18 (Cologne: Katalyse, 1997). Pre-packaged foods really only caught on in Germany after World War II: Susanne Hilger, "The Spread of Convenience Food in 20th Century Germany" (paper presented at 12th Annual Conference of the European Business History Association, Bergen, Norway, 21-23 August 2009).

⁶⁸ Hanna Dose, "Vorratshaltung und Konservierungsmethoden," in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 329-346 (Bielefeld: Regionalgeschichte, 1998).

coffee, pig tail instead of ham.⁶⁹ Indeed, class-based foodways could be graded from upper to lower according to the quality of the foods purchased, the quantities served, and the amounts of animal products—especially meat. Better-off Germans could afford to eat eggs and/or meat (including sausage or bacon) at almost every meal. Middle- and lower-middle-class families made sure to serve meat (preferably beef or pork) for the big Sunday dinner, settled for bacon or fish for weekday dinners, and frequently ate meatless suppers. Meanwhile, many working-class families were lucky if they could afford bacon or innards for Sunday dinner and often went without meat during the week.⁷⁰ Bavarian coppersmith Karl W. (*1891) remembered that “folks back then ... had potatoes and they—as the saying goes—scraped by. And their stomachs were full.”⁷¹ Revealingly, the colloquialism Karl used for “to scrape by” is “sich durchvegetieren,” which gives the sense of their bodies having taken on the substance of their plant-heavy diet through and through.

Interviews with Germans who were children of working-class parents in the 1890s and 1900s reveal differences in diet based on income, number of children, and whether the household had access to land to keep a garden and maybe livestock. Born into a family of knife sharpeners near Solingen, North Rhine-Westphalia, Albert S. (*c.1895) recalled that they had meat “now and then”; but the family of 14 next door suffered from the father’s misspending of his wages on

⁶⁹ Teuteberg, “Die tägliche Kost unter dem Einfluß der Industrialisierung,” 353; Teuteberg and Günter Wiegelmann, “Ein Grundnahrungsmittel in der Einzelberatung: Die Entwicklung des Fleischverbrauchs,” in *Der Wandel der Nahrungsgewohnheiten unter dem Einfluss der Industrialisierung* (Göttingen: Vandenhoeck und Ruprecht, 1972), 94-132.

⁷⁰ Analysis based on the suggested weekly diets for a family of four whose economic status could be described as “better-off,” “[average],” or “very poor.” Commission des Verbandes “Arbeiterwohl,” *Das häusliche Glück. Vollständiger Haushaltungsunterricht nebst Anleitung zum Kochen für Arbeiterfrauen. Zugleich ein nützliches Hilfsbuch für alle Frauen und Mädchen, die billig und gut haushalten lernen wollen. Mit Interviews aus Arbeiterfamilien*, 11. Aufl. (M. Gladbach und Leipzig: A. Riffarth, 1882; facs. ed. Richard Blank, Munich: Rogner & Bernhard, 1975), 192-205. I use Blank’s name when citing his concluding essay and the interviews he conducted.

⁷¹ Karl W.: “die Leute früher ... haben Kartoffeln gehabt, und die haben sich, wie man so sagt, durchvegetiert. Die Bäuche waren ja voll.” Blank, *Das häusliche Glück*, 238-239. For other examples of the misery of the proletariat around Europe, see the two volumes of socialist propaganda published as Otto Rühle, *Illustrierte Kultur- und Sittengeschichte des Proletariats* (Berlin: Neuer Deutscher Verlag, 1930).

alcohol and tailored suits rather than food.⁷² Ilse W. grew up with Silesian miners in southeastern Prussia, and the family only ate meat during the week if her mother also went out to work.⁷³ Meanwhile, Johann A.'s parents labored in the fields and at a brewery in a small town in southwestern Bavaria; they kept some geese and a pig that, having been fattened on scraps and slaughtered in the autumn, was the family's sole source of meat for the entire year. As a child he wondered why his father didn't ask his mother to cook meat more often; only later did he realize it was beyond their means.⁷⁴ Barbara H. remembered that her father ate sausage and soup when he came home from working on the railroad near Munich, and though her mother drank half a beer every day, she could not recollect ever having seen her mother actually sit down to eat a proper meal.⁷⁵ This "internal rationing" within a family was an accepted way to stretch a tight budget: whoever who went out to work received more and more nourishing food, both to fuel their waged labor and as a sign of their importance to and in the household.⁷⁶

Along with the demographic and economic changes that Teuteberg described, Eva Barlösius has identified a major shift in the sociocultural function of household meals in the mid-nineteenth century: whereas rural, farming households were organized around sustenance, urban families sat down to table as a form of social bonding, eating together out of love rather than necessity.⁷⁷ Regardless of how much of their food they produced, Germans of all classes valued

⁷² Blank, *Das häusliche Glück*, 240. On alcoholism among workers: Karl W., 238-239; Barbara Orland, "Bad Habits and Liquid Pleasures: Milk and the Alcohol Abstinence Movement in late 19th Century Germany," *Food & History* 5, no. 2 (2007): 153-169.

⁷³ Blank, *Das häusliche Glück*, 234.

⁷⁴ Blank, *Das häusliche Glück*, 227-231.

⁷⁵ Blank, *Das häusliche Glück*, 245.

⁷⁶ Commission des Verbandes "Arbeiterwohl," *Das häusliche Glück*, 8; Christina Benninghaus, *Die anderen Jugendlichen: Arbeitermädchen in der Weimarer Republik* (Frankfurt am Main: Campus Verlag, 1999), 98-102; Ellen Ross, "'There Is Meat Ye Know Not Of': Feeding a Family," in *Love and Toil: Motherhood in Outcast London, 1870-1918* (New York: Oxford University Press, 1993), esp. 31-36.

⁷⁷ Eva Barlösius, *Soziologie des Essens: Eine sozial- und kulturwissenschaftliche Einführung in die Ernährungsforschung*, 2. Aufl. (Weinheim: Juventa, 2011, 1999), 175-190; Eva Barlösius, "Die Küche als sozialkulturelles Phänomen," in *Ernährungskultur im Wandel der Zeiten*, ed. Katalyse e. V. and Buntstift e. V., 5-10 (Cologne: Katalyse, 1997).

the idea(l) of a warm, sit-down, family meal—preferably in the middle of the day to allow sufficient time for digestion before sleeping for the night. Whether or not this practice had existed in some bucolic, pre-industrial past, the domestic lunch came to be imbued with the responsibility of representing the German family, especially as industrial time and growing distances between home and work made it difficult for everyone to gather at the table at midday. (School generally ended in time for the children to eat at home.)

Gender and generational roles surrounded the table. According to one household guide that reveals more about middle-class assumptions than working-class practices, it was the husband's responsibility to provide the "bread" (literally and figuratively) and the wife's to make a proper meal out of it: "He must bring the bread home and provide the food in the kitchen; but through your thrift you must provide the butter for the bread and the meat for the pot."⁷⁸ Thus, both men and women were supposed to contribute to the provision of an orderly table: the man by earning the money and the woman by spending it wisely.⁷⁹ Once seated, everyone had a role to perform: the father presided as head of the household, the mother expressed her affection by serving a delicious dinner, and the children sat in quiet, obedient attendance, if they were allowed at all.⁸⁰ (The youngest were often fed before the father returned from work.⁸¹) However, the woman's duties regarding the stove and table were important not just for reasons of idealized

⁷⁸ "Er muß dir das Brod in's Haus, die Nahrungsmittel in die Küche schaffen; du aber mußt durch deine Sparksamkeit die Butter zum Brod, das Fleisch in den Topf schaffen." *Das häusliche Glück*, 15-16. Fewer and fewer households baked their own bread, preferring to delegate this time- and fuel-consuming task to commercial bakeries. On the social capital associated with the breadwinner ideal, Jan de Vries, *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present* (New York: Cambridge University Press, 2008); Marion W. Gray, *Productive Men, Reproductive Women: The Agrarian Household and the Emergence of Separate Spheres during the German Enlightenment* (New York: Berghahn Books, 2000).

⁷⁹ On working-class women's responsibility for the household budget, Benninghaus, *Die anderen Jugendlichen*, 102-107, 110-116; Ross, "Feeding a Family"; Peter Lummel and Alexandra Deak, eds., *Einkaufen: eine Geschichte des täglichen Bedarfs* (Berlin: Verein der Freunde der Domäne Dahlem, 2005).

⁸⁰ E.g. "Diätetsche Winke: Ueber die Stimmung bei Tisch," *Dresdner Hausfrau* 28, no. 5 (31 Oct. 1929): X-XI; Dr. med. Herde, "Das Tischgespräch," *DH* 28, no. 18 (30 Jan. 1930): [14].

⁸¹ Commission des Verbandes "Arbeiterwohl," *Das häusliche Glück*, 88-91; Schlegel-Matthies, "Mahlzeit und Familienglück," 151.

domestic bliss that reinforced patriarchal social norms but also for larger cultural reasons:

The more civilization and education a people has attained, the more care its women devote to the preparation of food; through the art of the kitchen they make sure that foods in the pot, in the frying pan, or in the oven are transformed such that they delight tongue and gums with their pleasant flavor. Therefore it is one of the most important duties of the housewife to learn well the art of cooking and to continually perfect it.⁸²

One scholar summed up this hierarchy as “God in heaven, the king on earth, the master of the factory, and the father at home.”⁸³

In late-nineteenth- and early twentieth-century Germany, the (family) table had been politicized as a locus for the performance of gender and generational roles, the application of modern medical science, and as a site with implications for national well-being. My model therefore intercalates “the family” as a node of analysis between the individual and the social. It is a natural level of abstraction in the eating (and drinking) telescopic body, because most Germans lived in households that shopped, cooked, and supped together.⁸⁴ Even single Germans were defined by this lack: it was socially acceptable for bachelors and single working girls who did not know how to cook or who rented apartments without kitchens to eat meals at restaurants or cafeterias, but married men were supposed to eat at home; and if they did not, their wives

⁸² “Je mehr Gesittung und Bildung ein Volk erlangt hat, desto mehr Sorgfalt verwenden seine Frauen auf die Zubereitung der Speisen; durch die Kunst der Küche sorgen sie, daß die Nahrungsmittel im Kochtopf, in der Bratpfanne oder im Backofen so umgewandelt werden, daß sie auch Zunge und Gaumen durch ihren Wohlgeschmack erfreuen. Drum ist es eine der wichtigsten Pflichten der Hausfrau, die Kunst des Kochens gut zu lernen und sich stets darin zu vervollkommen.” Commission des Verbandes “Arbeiterwohl,” *Das häusliche Glück*, 81.

⁸³ “Gott im Himmel, der König auf Erde, der Herr der Fabrik und der Vater im Hause.” Blank, *Das häusliche Glück*, 221.

⁸⁴ The *Statistisches Jahrbuch des Deutschen Reichs* reported that in 1871, 2/3 of German adults (40% of the population) were married, widowed, or divorced. There were 8.73 million “households” with an average of 4.7 members. *Statistisches Jahrbuch* (1881), 9-11, 4. After the 1910 census, living situations were described as “single,” “household,” and “institution.” 95% of Germans were classified as living in households; average size was still 4.7 persons. Of these households, 3/4 consisted only of family members; the other 1/4 divided roughly evenly into those with servants, boarders, or work hands living under the same roof. The numbers were almost the same in Saxony, with a slightly higher percentage of boarders: 11.5% compared to 9% nationally. About 2% of the German population lived alone (70% female), while 4-5% was counted in an institution (70% male in the military, prisons, and hospitals). Kaiserliches Statistisches Amt, *Statistisches Jahrbuch für das Deutsche Reich*, 33. Jhrg. (Berlin: Puttkammer & Mühlbrecht, 1913), 4-5.

were assumed to have failed at the (overdetermined) task of home-making.⁸⁵ Married women were assumed to eat at home. Therefore, consider “the table” as the real and metaphorical site where biological needs met sociocultural forces. For the purposes of this dissertation, that often means the family dining table, but it includes the tray brought into a sick room and the bench where workers ate on their breaks.

“The politics of the table” therefore refers to what Germans as individuals could choose to do for their health, for the good of the Volk, and in support of the local or national economy. It also refers to the ways in which various groups tried to influence each other to eat (and drink) certain things and not others. For all the talk of “the modern individual’s” ability to fashion his or her own lifestyle, physicians, nutritionists, and reformers were not merely providing different options from which individuals could select what suited their personal tastes, budgets, and time to shop and cook. They cared very much what choices were made. This is why domestic scientist Hedwig Heyl encouraged her readers to drink water for the refreshment of their bodies and the prosperity of both the private household and the state.⁸⁶ And why internist Georg Klemperer could include sociological advice in the middle of a textbook on clinical dietetics: “Meals should create the bonds of family: the domestic hearth is the meeting point of family members and intimate friends!”⁸⁷ Over these four-and-a-half decades, Germans were told with increasing frequency and urgency that they had a responsibility to others to feed themselves in certain ways. Current nutritional education campaigns are in many ways no less coercive or paternalistic.

⁸⁵ Schlegel-Matthies, “Mahlzeit und Familienglück,” 150-152.

⁸⁶ Hedwig Heyl, *ABC der Küche* (1910), as quoted in Annemarie Wilz, “Allgemeine Kochbücher,” in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 87-240 (Bielefeld: Regionalgeschichte, 1998), 140. Wilz: “Seen in this way, a good, delicious diet is not only a private enjoyment but also a patriotic duty.”

⁸⁷ “Die Mahlzeiten sollen endlich den Zusammenhang der Familie gestalten: der häusliche Herd ist der Vereinigungspunkt der Familienmitglieder und der intimen Freunde!” Ernst von Leyden, “Die Diätetik (Ernährungstherapie) des Gesunden,” *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden and Georg Klemperer, 2. Aufl., vol. 1, 263-280 (Leipzig: Georg Thieme, 1903), 268. In this second edition, Klemperer added a discussion of table manners to von Leyden’s description of Germans vs. Anglo-Saxon foodways.

Beginning this study around 1890 allows 25 years' lead time before World War I (about one generation) to set the stage for the nutritional knowledge and diet patterns that the war affected so profoundly. Diet and food technologies in 1890 would be unfamiliar to most modern readers; but by the 1930s, there were gas and electric stoves, long-distance refrigeration, and many more prepared and/or preserved foods available. The dissertation ends in 1935 with a discussion of how food science and public policy changed after the Nazis' "power grab" set the country on the road to World War II, in which the Germans used food rationing as a weapon against "inferior" groups of people (i.e. concentration camp prisoners and forced laborers) and for stability in the Reich. Although I am writing a history of events that happened before (and just after) the National Socialists' seizure of power in 1933, it is not a pre-history to the Third Reich. The science I discuss did not bring Adolf Hitler to power, but it did inform the doctrine of "living space" (*Lebensraum*) and shape how his fascist government waged the coming war.⁸⁸

Just one caveat: I have consciously omitted beverages and drinking from the bulk of my analysis out of respect for the large and growing literature on infant and maternal health, temperance, food innovation and marketing, colonial linkages, class cultures, etc. Breast milk, cow's milk, fruit juice, beer, coffee, tea, and cocoa do appear on the pages of this dissertation; and although I do not scrutinize them as closely as the meat, potatoes, vegetables, and baked goods that also appear, I assume they follow the telescopic model just as well.

Saxon Germany, 1890-1930

Today the Free State of Saxony is probably best known for its combination of history and

⁸⁸ Elizabeth M. Collingham, *The Taste of War: World War Two and the Battle for Food* (London: Allen Lane, 2011); Gustavo Corni and Horst Gies, *Brot, Butter, Kanonen: die Ernährungswirtschaft in Deutschland unter der Diktatur Hitlers* (Berlin: Akademie Verlag, 1997). On the science behind agricultural autonomy see Susanne Heim, *Kalorien, Kautschuk, Karrieren. Pflanzenzüchtung und landwirtschaftliche Forschung in Kaiser-Wilhelm-Instituten 1933-1945* (Göttingen: Wallstein Verlag, 2003); Jörg Melzer, Part 3, *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch* (Stuttgart: Franz Steiner, 2003).

culture. Since the nineteenth century, the capital of Dresden has been called “the Florence of the Elbe” (*das Elbflorenz*) for its baroque architecture, art museums, and Semper Opera House.

Johann Sebastian Bach lived in Leipzig for the last 27 years of his life, and the excellent reputation of the Leipzig Conservatory (est. 1843) attracted students and instructors from around Europe, among them Felix Mendelssohn Bartholdy (its founder), Clara and Robert Schumann, Sir Arthur Sullivan (of “Gilbert and Sullivan”), Edvard Grieg, and Leoš Janáček. At various times in their lives Richard Wagner, Erick Kästner, and Viktor Klemperer called Dresden and Leipzig home. More recently, Kurt Vonnegut’s novel *Slaughterhouse-Five* (1969) made the Allied firebombing of Dresden on 13-14 February 1945 a common pop-cultural referent in the English-reading world. Leipzig hosted massive peaceful Monday demonstrations in the waning years of the German Democratic Republic (GDR) that contributed to the fall of that dictatorship.

An old saw—“Money is earned in Chemnitz, multiplied in Leipzig, and distributed in Dresden”—stereotypes Saxony’s three largest cities: the industrial center of Chemnitz, the trade city of Leipzig, and the government seat of Dresden.⁸⁹ Mining and manufacturing contributed significantly to the reputation of the Kingdom of Saxony.⁹⁰ Mines for silver, kaolin, tin, coal, and iron began attracting workers to the Ore Mountains (*Erzgebirge*) in the late 1400s; and in the 1800s working-class cities like Chemnitz, Plauen, and Zittau grew up around heavy machine and textile manufactories for cotton, linen, and wool. The city of Zwickau has been synonymous with automobiles for over a century, hosting the Horch (1904-1932) and Audi (1909-1948) factories;

⁸⁹ “In Chemnitz werde das Geld verdient, in Leipzig werde es vermehrt und in Dresden werde es ausgegeben.” Quoted on p. 25 in Michael Schäfer, “Wirtschaftsbürger und Residenzstadt. Dresdner Unternehmer im 19. Jahrhundert,” *Dresdner Hefte* 26, no. 93: Bürgertum und Bürgerlichkeit in Dresden (Jan. 2008): 25-34. Another version runs “What is earned in Chemnitz is traded in Leipzig and squandered in Dresden” (*Was in Chemnitz erarbeitet wird, wird in Leipzig gehandelt und in Dresden verprasst*).

⁹⁰ Uwe Schirmer, “Ernährung im Erzgebirge im 15. und 16. Jahrhundert: Produktion, Handel und Verbrauch,” in *Landesgeschichte in Sachsen: Tradition und Innovation*, ed. Rainer Aurig, Steffen Herzog, Simone Lässig, 129-144 (Bielefeld: Verlag für Regionalgeschichte, 1997), 129-130; Katrin Keller, *Landesgeschichte Sachsen* (Stuttgart: Ulmer, 2002), 100-104, 201-215, 308-340.

during the GDR, Automobilwerk Zwickau (1948-1991) produced the popular Trabant (“Trabi”). Chemnitz, sometimes called “Germany’s Manchester,” was chosen for the honor of being re-named Karl-Marx-City (1953-1990) for its industrial importance.

Meanwhile, Dresden and Leipzig, the German Empire’s fourth and fifth largest cities at the turn of the century, tended to support lighter industries like cigarettes, chocolate, and wicker in addition to their main employers: the government and trade sectors, respectively.⁹¹ With its mild river-valley climate, Dresden was a popular site for retirees and tourists, who came for the exhibitions on everything from Italian paintings to the prevention of tuberculosis.⁹² Centrally located on the roads and rail lines, Leipzig had hosted trade fairs (*Messen*) since the Middle Ages and was a major publishing center. Workshops in the nearby town of Meissen still produce its trade-marked porcelain, invented in 1708 on orders from Elector Frederick August I (1670-1733) as a lucrative domestic alternative to imported Chinese porcelain.

In 1890, parliamentary power in the Kingdom of Saxony (1806-1918) was concentrated in the hands of conservative rural and economic elites, while popular politics in “red Saxony” were heavily influenced by the home-grown Socialist Party of Germany (SPD) and its appeals to the proletarian masses.⁹³ Brett Fairbairn has quipped that “Saxony was the first German region to

⁹¹ Friedrich Schäfer, “Die Bevölkerung Dresdens,” in *Wissenschaftliche Führer durch Dresden*, ed. Schäfer, 359-367 (Dresden: Zahn & Jaensch, 1907); *Dresdner Hefte* 18, no. 61: Industriestadt Dresden? Wirtschaftswachstum im Kaiserreich (Jan. 2000).

⁹² Eberhard Brüning, “‘Saxony is a Prosperous and Happy Country’: American Views of the Kingdom of Saxony in the Nineteenth Century,” in *Traveling between Worlds: German-American Encounters*, ed. Thomas Adam and Ruth V. Gross, 20-50 (College Station: Texas A&M University Press, 2006). Besides the art and hygiene museums, in the 1920s the Jahresschau Deutscher Arbeit hosted a series of yearly exhibitions to showcase German industries. See Georg Seiring and Marta Fraenkel, eds., *10 Jahre Dresdner Ausstellungsarbeit: Jahresschauen deutscher Arbeit 1922-1929 und Internationale Hygiene-Ausstellung 1930/31* (Dresden: Verlag der IHA 1930/31, 1931); and the draft of Dr. Klien’s speech for the closing celebration of the second International Hygiene Exhibition (2. IHA) on 20. September 1931, docs. 118-121, Nr. 595 Internationale Hygiene-Ausstellung 1931 im Rahmen der Jahresschau Deutscher Arbeit (1930-1931), 11168 MfW, SHAD.

⁹³ *Dresdner Hefte* 22, no. 80: Das »Rote Königreich« und sein Monarch (April 2004); Wolfgang Schröder, “Saxony’s ‘Liberal Era’ and the Rise of the Red Specter in the 1870s,” in *Saxony in German History: Culture, Society, and Politics, 1830-1933*, ed. James Retallack, 322-335 (Ann Arbor: University of Michigan Press, 2000); Karsten Rudolph, “Das ‘rote Königreich’: Die sächsische Sozialdemokratie im Wilhelminischen Deutschland,” in

be socialist [under the SPD during the Weimar Period], the first to be antisocialist [under the NSDAP during the Third Reich], and the first to be postsocialist [in 1989].”⁹⁴ The first two swings in particular can be attributed in part to the absence of the Catholic Center Part; in fact, Saxony’s Protestantism made it socially and culturally more like central Prussia than like Catholic Bavaria, the Rhineland, and ethnically Polish regions to the east. Both the monarchy (until 1918) and the democratically elected socialist governments (1919-1933) fostered public health campaigns and policies that encouraged personal responsibility for one’s health and—especially after World War I—for the health of Saxons (and Germans) as a whole.

A combination of geography and influential personalities fostered a booming health industry.⁹⁵ Saxony lies in what is now the southeast corner of Germany, bordering Poland (Silesia) and the Czech Republic. Hilly-to-mountainous land on the southern border flattens into the northern plain that hosted Napoleon’s first major defeat, at the Battle of the Nations in 1813 (*die Völkerschlacht*). Like western Bohemia, southern Saxony boasted numerous mineral spas, sanatoria, and rest homes catering to vacationers, medical tourists and pensioners in the

Sachsen im Kaiserreich: Politik, Wirtschaft und Gesellschaft im Umbruch, ed. Simone Lässig und Karl Heinrich Pohl, 87-100 (Weimar: Böhlau Verlag, 1997).

⁹⁴ Brett Fairbairn, “Community Values, Democratic Cultures? Reflections on Saxony’s Place in the German Cooperative Movement, 1849-1933,” in *Saxony in German History: Culture, Society, and Politics, 1830-1933*, ed. James Retallack, 180-198 (Ann Arbor: University of Michigan Press, 2000), 180. Fairbairn relies on Benjamin Lapp, *Revolution from the Right: Politics, Class, and the Rise of Nazism in Saxony, 1919-1933* (Atlantic Highlands, NJ: Humanities Press International, 1997); and *ibid.*, “Der Aufstieg des Nationalsozialismus in Sachsen,” in *Dresden unterm Hakenkreuz*, ed. Reiner Pommerin, 1-24 (Cologne: Böhlau, 1998). For more background, see Claus-Christian W. Szejnmann, “The Development of Nazism in the Landscape of Socialism and Nationalism: The Case of Saxony, 1918-1933,” in *Saxony in German History: Culture, Society, and Politics, 1830-1933*, ed. James Retallack, 356-372 (Ann Arbor: University of Michigan Press, 2000).

⁹⁵ Martin Vogel, “Wissenschaft und Volk. Ein Wort zur Ausstellung ‘Richtige Ernährung,’” doc. 66a, Bd. 2 Richtige Ernährung 1928-1929, Nr. Z Zeitungsausschnittsammlung, 13658 Deutsches Hygiene-Museum Dresden, SHAD; “Der Freistaat Sachsen auf der Hygiene-Ausstellung,” *Dresdner Anzeiger* 200. Jhrg., no. 234 (20 May 1930): 5; Dr. med. Wäder, “Ergebnisse. 35. Internationale Hygiene-Ausstellung Dresden 1930,” *Zentralblatt für die gesamte Hygiene mit Einschluß der Bakteriologie und Immunitätslehre* 22, no. 13 (1930): 793-801; Günter Heidel, “Die Stadt der Hygiene. Historische Wurzeln und Hauptereignisse einer bedeutenden Dresdner Tradition,” *Dresdner Hefte* 7, no. 20: Von der Residenz zur Großstadt—Aspekte kultureller Entwicklung von 1871-1918 (May 1989): 21-27; Matthias Dietze, “Reinlich, sauber und gesund!: der menschliche Körper im Spannungsfeld von popularisierter Hygiene und öffentlicher Gesundheitspflege in Dresden 1850 bis 1911,” *Dresdener Beiträge zur Geschichte der Technik-wissenschaften* 29 (2004): 43-68.

nineteenth and early twentieth centuries. Chief among them were Bad Elster, declared the official royal spa of Saxony in 1848; Bad Schandau in the Elbe River valley near the hiking-friendly sandstone formations of the Saxon Switzerland (*die Sächsische Schweiz*); and Heinrich Lahmann's Sanatorium at Weißer Hirsch in Loschwitz, reputedly the most expensive and exclusive destination in Continental Europe until the outbreak of World War I.⁹⁶ Other healers in the region included hydrotherapist Louis Kuhne (1835-1901), who invented cold-water genital baths; naturopathic generalist Friedrich Bilz (1842-1922); and Dr. Siegfried Möller (1871-1943), who touted cold wet wraps and the "Schroth cure" (fasting). As one author has aptly phrased it, "The Kingdom of Saxony was both cradle and stronghold of the naturopathy movement."⁹⁷

Indeed, a variety of alternative and scientific institutions founded and/or headquartered in Saxony shaped dialogues on health and wellness in the nineteenth and twentieth centuries.⁹⁸

Organized vegetarianism in Germany began with theologian Eduard Baltzer's (1814-1887) establishment of the German Association for Natural Living (Vegetarians) (*Deutscher Verein für natürliche Lebensweise [Vegetarianer]*) in Leipzig in 1867.⁹⁹ The largest non-profit organization for the promotion of "natural medicine" in Germany, the Deutsche Naturheilbund (DNB), is the current iteration of a line of associations with roots in Saxony, specifically Chemnitz, where machine tool manufacturer Johann von Zimmermann's (1820-1901) financial patronage extended to opened a naturopathic sanatorium in his name in 1885.¹⁰⁰ In 1894, the Technische

⁹⁶ Marina Lienert, *Naturheilkundiges Dresden* (Dresden: Elbhang-Kurier-Verlag, 2002), 40, 61-62.

⁹⁷ Cornelia Regin, "Zwischen Angriff und Abwehr: Die Naturheilbewegung als medizinkritische Öffentlichkeit im Deutschen Kaiserreich," in *Medizinkritische Bewegungen im Deutschen Reich (c. 1870-c. 1933)*, ed. Martin Dinges, 39-58 (Stuttgart: Franz Steiner Verlag, 1996), 40.

⁹⁸ See e.g. Schäfer, *Wissenschaftlicher Führer durch Dresden*.

⁹⁹ Ulrike Thoms, "Vegetarianism, Meat and Life Reform in Early Twentieth-Century Germany and their Fate in the 'Third Reich,'" in *Meat, Medicine, and Human Health in the Twentieth Century*, ed. David Cantor, Christian Bonah, and Matthias Dörries, 145-157 (London: Pickering & Chatto, 2010); Sabine Merta, *Wege und Irrwege zum modernen Schlankheitskult. Diätik und Körperkultur als Suche nach neuen Lebensstilformen 1880-1930* (Stuttgart: Franz Steiner Verlag, 2003), 67-69.

¹⁰⁰ The forerunners of the DNB include the Deutscher Bund für naturgemäße Lebens- und Heilweise (est. 1889) and

Hochschule in Dresden (est. 1871) became the second institution in Germany to offer a course in food chemistry.¹⁰¹ It was taught by hygienist Georg Friedrich Renk (1850-1928), who also headed one of the earliest municipal food control laboratories, at Dresden's Center for Public Health (*Zentralstelle für öffentliche Gesundheitspflege*, est. 1878). Philanthropic-industrialist Karl August Lingner's various enterprises, from his Odol mouthwash factory (est. 1892) to the German Hygiene Museum (est. 1911), contributed to the circulation of ideas about health and hygiene among both experts and laypeople. Dresden was further home to the Union of Healers in Germany (*Verband der Heilkundigen Deutschlands*, 1920-1925) and to the National Committee for Public Education on Hygiene (*Reichsausschuß für hygienische Volksbelehrung*, 1921-1925). Finally, medical education was available at the University of Leipzig (est. 1409), one of Germany's oldest and largest, and at the independent medical academy in Dresden (est. 1815). Living in a milieu suffused with both academic medicine and the natural healing arts, Saxons could hardly help but view their bodies through a combination of physiology and holism, personal experience and popular hygiene education.

Conclusion

Scholars of bodies have paid particular attention to the historical importance of sexual health and reproduction.¹⁰² Their discussions of rhetoric about the need to improve and transmit the best hereditary material to ensure the "health of the nation" and practices to enact this idea

the Zentralverein für Naturheilkunde in Sachsen (est. 1872). Gunnar Stollberg, "Die Naturheilvereine im Deutschen Kaiserreich," *Archiv für Sozialgeschichte* 28 (1988): 287-305.

¹⁰¹ The first was the University of Marburg. Eberhard Ludwig, "Von Kohlenhydraten, Lipiden und Proteinen. 100 Jahre Lebensmittelchemieausbildung an der TU Dresden," *Universitätsjournal TU Dresden* 5, no. 14 (1994): 8; Uwe Spiekermann, "Redefining Food: the Standardization of Products and Production in Europe and the United States, 1880-1914," *History and Technology* 27, no. 1 (March 2011): 11-36, here 16.

¹⁰² Cornelia Osborne, *Cultures of Abortion in Weimar Germany* (New York: Berghahn Books, 2007); *ibid.*, *The Politics of the Body in Weimar Germany: Women's Reproductive Rights and Duties* (Ann Arbor: University of Michigan Press, 1992); Atina Grossmann, *Reforming Sex: The German Movement for Birth Control and Abortion Reform, 1920-1950* (Oxford: Oxford University Press, 1995); Renate Bridenthal, Atina Grossmann, and Marion Kaplan, eds., *When Biology Became Destiny: Women in Weimar and Nazi Germany* (New York: Monthly Review Press, 1984).

laid the groundwork for my theorization about the telescopic body. But eugenics, pronatalism, and racial hygiene were not the only “politics of the body” in the Imperial, Weimar, and Nazi periods: Germans also experienced their bodies through physical exercise,¹⁰³ fashion,¹⁰⁴ military service—and especially disability resulting from it.¹⁰⁵ They understood their individual and social bodies in terms of age,¹⁰⁶ sex/gender,¹⁰⁷ sexuality,¹⁰⁸ and race/ethnicity, too.¹⁰⁹ These categories have always relied on notions of “nature” and how bodies do or should function in various social settings. I examine Germans as eating, drinking, and digesting bodies.¹¹⁰

In this study, various kinds of nutritional advice and occasional first-person reports serve as lenses for looking at and into individual bodies, both real and imagined. Perhaps the most familiar quotation in this regard is “you are what you eat” (*Man ist was man ißt*), a phrase that in German plays on two homophones: the singular verb “to be” (*ist*) and the singular verb “to eat”

¹⁰³ Erik Jensen, *Body by Weimar: Athletes, Gender, and German Modernity* (New York: Oxford University Press, 2010); Nadine Rossol, *Performing the Nation in Interwar Germany: Sport, Spectacle and Political Symbolism, 1926-36* (New York: Palgrave Macmillan, 2010); Michael Hau, *The Cult of Health and Beauty in Germany: A Social History 1890-1930* (Chicago: University of Chicago Press, 2003).

¹⁰⁴ Elke Gaugele and K. Reiss, *Jugend, Mode, Geschlecht: die Inszenierung des Körpers in der Konsumkultur* (Frankfurt am Main: Campus Verlag, 2003); Patricia Brattig, ed., *Femme Fashion, 1780-2004: Die Modellierung des Weiblichen in der Mode = The Modelling of the Female Form in Fashion* (Stuttgart: Arnoldsche, 2003).

¹⁰⁵ Heather Perry, *Recycling the Disabled: Army, Medicine, and Modernity in World War I Germany* (Manchester: Manchester University Press, forthcoming); Carol Poore, *Disability in Twentieth-Century German Culture* (Ann Arbor: University of Michigan Press, 2007); Robert Weldon Whalen, *Bitter Wounds: German Victims of the Great War, 1914-39* (Ithaca: Cornell University Press, 1984).

¹⁰⁶ Thomas Bryant, “Von der ‘Vergreisung des Volkskörpers’ zum ‘demographischen Wandel der Gesellschaft’: Geschichte und Gegenwart des deutschen Alterungsdiskurses im 20. Jahrhundert,” *Tel Aviver Jahrbuch für Deutsche Geschichte* 35 (2007): 110-127; Sybilla Nikolow, “Anormale Kollektive. Die Darstellung des »Altersaufbaus der Bevölkerung des Deutschen Reiches« auf der Gesolei von 1926,” in *Kunst, Sport und Körper: Ge So Lei*, ed. Hans Körner and Angela Stercken, 217-226, Band 1: 1926-2002 (Ostfildern-Ruit: Hatje Cantz, 2002).

¹⁰⁷ Marion E. P. de Ras, *Body, Femininity and Nationalism: Girls in the German Youth Movement 1900-1934* (New York: Routledge, 2008); Kathleen Canning, *Gender History in Practice: Historical Perspectives on Bodies, Class and Citizenship* (Ithaca: Cornell University Press, 2006); Patricia Herminghouse and Magda Mueller, eds. *Gender and Germanness: Cultural Productions of Nation* (Providence: Berghahn Books, 1997).

¹⁰⁸ David J. Prickett, “Body Crisis, Identity Crisis: Homosexuality and Aesthetics in Wilhelmine- and Weimar Germany” (diss., Univ. Cincinnati, 2003); George L. Mosse, *Nationalism and Sexuality: Respectability and Abnormal Sexuality in Modern Europe* (New York: Howard Fertig, 1985).

¹⁰⁹ Boaz Neumann, “The Phenomenology of the German People’s Body (*Volkskörper*) and the Extermination of the Jewish Body,” *New German Critique* 106, no. 36:1 (Winter 2009): 149-180; Sharon Gillerman, *Germans into Jews: Remaking the Jewish Social Body in the Weimar Republic* (Stanford: Stanford University Press, 2009); Sander L. Gilman, *The Jew’s Body* (New York: Routledge, 1991).

¹¹⁰ See also Merta, *Wege und Irrwege zum modernen Schlankheitskultur*.

(*ibid.*)¹¹¹ It encapsulates the idea that since bodies require food, these must take on the qualities of their sustenance, whether “strengthening” meat or “tender” vegetables. Late-nineteenth- and early twentieth-century Germans also liked to paraphrase gourmand Jean Anthelme Brillat-Savarin’s (1755-1826) quotation of a French aphorism: “One does not live on what one eats but on what one digests.”¹¹² This sentence zooms past the macro-level of a common meal to the breakdown of recognizable foods into their microscopic component parts for the nourishment of the eater’s body. This is where scientific knowledge about nutrition is incorporated into the telescopic body.

As biological processes enmeshed with sociocultural practices, eating and digestion offer insights into interpersonal relationships and social bodies, too. In fact, “you are what you eat” is philosopher Ludwig Feuerbach’s complimentary summation of the scientific and political materialism in physiologist Jacob Moleschott’s 1852 book, *Der Kreislauf des Lebens (The Life Cycle)*.¹¹³ Feuerbach later grounded his philosophy about the apperception of the self in opposition to an other in the fundamental transformation of food into self, such that whoever does not eat like “us” (Christians) must be completely unlike us in social and political respects (Jews).¹¹⁴

¹¹¹ Jakob Tanner, “Der Mensch ist, was er isst: Ernährungsmythen und Wandel des Esskultur,” in *Ernährungskultur im Wandel der Zeiten*, ed. Katalyse e. V. and Buntstift e. V., 44-50 (Cologne: Katalyse, 1997).

¹¹² “On ne vit pas de ce qu’on mange, mais de ce qu’on digère.” Jean Anthelme Brillat-Savarin, *Physiologie du gout, ou Méditations de gastronomie transcendante: ouvrage théorique, historique et à l’ordre du jour* (Paris: Charpentier, 1847), 187. Quoted in Henriette Davidis and Luise Holle, *Praktisches Kochbuch für gewöhnliche und feinere Küche. Unter besonderer Berücksichtigung der Anfängerinnen und angehenden Hausfrauen*, 39. Aufl. (Bielefeld und Leipzig: Velhagen & Klasing, 1901), 770; Johann Friedrich Wilhelm Schilling, *Die Verdaulichkeit der Nahrungs- und Genußmittel auf Grund mikroskopischer Untersuchungen der Faeces* (Leipzig: Hartwig und Sohn, 1901), 8-9; Julius Petersen, “Zur Geschichte der Ernährungstherapie,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden and Georg Klemperer, 2. Aufl., vol. 1 (Leipzig: Georg Thieme, 1903), 18; Fischer-Dückelmann, *Die Frau als Hausärztin* ([1907?]), 47; Hans Garms and Max Reach, *Verdauungsstörungen. Ursachen und Abhilfe*, Thalysia-Ratgeber Nr. 8 (Leipzig: Verlag Thalysia Paul Garms, [1929?]), 17.

¹¹³ Harmke Kamminga, “Nutrition for the People, or the Fate of Jacob Moleschott’s Contest for a Humanist Science,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Kamminga and Andrew Cunningham, 15-47 (Atlanta: Rodopi, 1995).

¹¹⁴ Jay Geller, “It’s ‘Alimentary’: Feuerbach and Dietetics of Antisemitism,” in *Cultures of the Abdomen: Diet, Digestion, and Fat in the Modern World*, ed. Christopher E. Forth and Ana Carden-Coyne, 127-146 (New York: Palgrave MacMillan, 2005); see also Thomas Schlich, “The Word of God and the Word of Science: Nutrition Science and the Jewish Dietary Laws in Germany, 1820-1920,” in *The Science and Culture of Nutrition, 1840-1940*,

In their arguments about what should be eaten and why, late-nineteenth- and early twentieth-century scientists, philosophers, gourmands, and reformers stretched the body of the eating individual down to the cellular level and up to the social level. The ramifications of each level of magnification were telescoped and concretized in the meals that were prescribed and eaten, such that dietary pronouncements and actual food habits had real implications on personal and group identity, class warfare, religious tolerance, and citizenship—“who and whatever you are!”

PART I

“The Kitchen is the Laboratory of the Housewife”¹¹⁵:

The Circulation of Nutritional Science

¹¹⁵ “Die Küche ist das Laboratorium der Hausfrau.” R.B., “Das Werkzeug der Hausfrau,” *Dresdner Hausfrau* 19, no. 51 (18 Sept. 1921): 1.

Introductory Essay to Part I: Nutrition in the Laboratory, 1890-1930

Answer to J. S. (Qu. 17, Nr. 6) 2. One makes donuts from 1-1 ½ lb flour, 1 egg, ¼ lb butter, ¼ lb sugar, a pinch of salt, 6-cents' worth of yeast, and enough milk to make a supple dough. When the lump has risen, maybe for an hour, roll it out flat and cut out donuts of the desired size with a pastry-cutting wheel. Let them rise again and deep-fry them in grease and Palmin [margarine]. They are then strewn with sugar. Mrs. J. B.¹¹⁶

The exquisite plant-based oil Kunerol, made from the fruit of the coconut tree, has acquired a rare accolade from foreign and international scientific circles. Numerous state food control laboratories, eminent chemists, and physicians describe Kunerol as the best cooking fat, which equals the purest butter in every respect. Now this healthful, pure plant fat has been churned with butter aroma from carefully pasteurized milk to produce the plant-butter Kunerona. As a matter of fact, it is indistinguishable from butter in both appearance and taste, which is why—although completely free of animal fats—it must be called “margarine” according to the law.¹¹⁷

Testimonial: I have had opportunity to recommend Kunerol and especially Kunerona for healthy as well as sick individuals and declare my utter satisfaction with this cooking fat. It is particularly well tolerated by those with gastrointestinal disorders and is readily accepted [in place of butter] on account of its pure and unadulterated taste. In addition to these advantages, there is also the high fat content, the total lack of acidity and germs, and the exceptionally low salt content of Kunerona-Butter, such that these products can be described as a valuable addition to dietetics for the healthy and sick. Signed, Dr. H., Specialist in Gastroenterology and Diabetes, 25 October 1912.¹¹⁸

¹¹⁶ “Antworten. J.S. (Frg. 17, Nr. 6) 2. Man macht Kräppelchen von 1-1 ½ Pfd. Mehl, 1 Ei, ¼ Pfd. Butter, ¼ Pfd. Zucker, einer Messerspitze Salz, für 6 ½ Hefe und so viel Milch, daß es ein geschmeidiger Kuchenteig wird. Wenn die Masse gegangen ist, vielleicht eine Stunde, treibt man sie in einen Kuchen aus und schneidet mit dem Kuchenrädchen beliebige Kräppelchen, läßt sie nochmals gehen und bäckt sie in Schmierfett und Palmin aus. Sie werden dann mit Zucker bestreut. Frau J. B.” *Dresdner Hausfrau* 11, no. 9 (29 Nov. 1912): 27-28. Interestingly, Palmin was not one of the many plant-based cooking fats advertised in the *DH*, so I have paired this recipe with two notices about palm-oil Kunerona.

¹¹⁷ “Eine seltene Anerkennung hat seitens der wissenschaftlichen Kreise des In- und Auslandes das aus der Frucht der Kokospalme erzeugte, vorzügliche Pflanzenfett Kunerol gefunden. Zahlreiche staatliche Untersuchungsanstalten für Genußmittel, hervorragende Chemiker und Aerzte bezeichnen Kunerol als das ausgezeichneteste Speisefett, das der reinsten Butter in jeder Beziehung gleichkommt. Neuerlich wird aus diesem gesunden, reinsten Pflanzenfett, durch Verbutterung mit dem aus sorgfältig pasteurisierter Milch gewonnenen Butteraroma die Pflanzenbutter Kunerona erzeugt, die tatsächlich weder in Aussehen, noch im Geschmack von anderer Butter zu unterscheiden ist, daher, dem Gesetz entsprechend—obzwar gänzlich frei von tierischen Fetten—‘Margarine’ bezeichnet werden muß.” *Dresdner Hausfrau* 11, no. 7 (15 Nov. 1912): 30. The laws were the Gesetz, betreffend den Verkehr mit Butter, Käse, Schmalz und deren Ersatzmitteln, 15 June 1897, RGBl Nr. 27, 475-480, and the Gesetz, betreffend den Verkehr mit Ersatzmitteln für Butter, 12 July 1887, RGBl Nr. 28, 375-376.

¹¹⁸ “Zeugnis: Ich habe das Kunerol und besonders die Kunerona sowohl bei Kranken, wie bei Gesunden anzuwendenden Gelegenheit gehabt und spreche Ihnen meine ausserordentliche Zufriedenheit mit diesen Speisefetten aus. Sie wurden speziell auch von Magen- und Darmkranken gut vertragen und wurden auch ihres reinen und unverfälschten Geschmacks wegen gerne genommen. Zu diesen Vorzügen kommt der hohe Fettgehalt, die absolute Säure- und Keimfreiheit und der äusserst geringe Salzgehalt der Kunerona-Butter, sodass diese Produkte als eine wertvolle Bereicherung der Diätetik für Gesunde und Kranke bezeichnet werden können. gez. Dr. H., Spezialarzt für Magen-, Darm- u. Zuckerkr. 25. Oktober 1912” *Dresdner Hausfrau* 11, no. 8 (22 Nov. 1912): 11.

Before we explore the ways in which nutritional science was mobilized in late-nineteenth- and early twentieth-century Germany for projects ranging from individual lifestyle choices to the improvement of the health of the nation, it is helpful to be familiar with the state of the science. In this essay, I draw on primary and secondary sources to describe the broad range of knowledge available—from folk wisdom to mainstream laboratory science to the “life reform movement” (*Lebensreformbewegung*)—to consider what it was possible for Germans to know about the science of nutrition over these four decades. They encountered ideas about foods and their effects on bodies not only in magazine advertisements like those above, but also in cookbooks and textbooks, lectures and exhibitions, and encounters with a variety of healers. Against this backdrop we can attempt to measure changes in knowledge and practice among scientists, hygienists, and ordinary lay persons when nutritional science was applied in clinical dietetics (Chapter 1), popular hygiene education (Chapter 2), and food production in industrial and domestic kitchens (Chapter 3). Participation in these and other dialogues contributed to a reductive biologization of Germans’ experiences of food and digestion that became the “lower half” of the telescopic body. (The “upper half” grew out of nationalist concerns for the strength of *das Volk* that spread during and after World War I and is the subject of Part II.)

We must attend to such a variety of sources, actors, and sites of application, because nutritional knowledge extended along a continuum of expertise from biochemists and physiologists on one end through physicians, nutritionists, and teachers to cookbook authors, housewives, and ordinary lay Germans on the other. There are many reasons why it was and is difficult to divide the group of persons who know something about food and health into dietary “experts” on the one hand and “amateurs” on the other. First, food is an everyday reality; as most people eat and drink multiple times per day, they feel (and often are) best poised to know what tastes

good to them, how much they need to eat or drink to feel satisfied, and what “agrees with” their digestive systems.¹¹⁹ Second, the boundaries of “the laboratory” are always porous, as scientists are members of society too; and “society” affects “science” through funding, what questions are considered important to ask, and what kind of evidence is accepted as conclusive enough for an answer.¹²⁰ Third, the various kinds of experts all possess the knowledge suitable for their place along the spectrum. A housewife in 1910s Bautzen, for example, did not need to know which fats made up butter or margarine, just that science, technology, and empire had given her choices in bread spreads. Finally, information flow is not unidirectional from the conceptual and physical spaces of the “laboratory” to those of “the kitchen.” Rather, information, ideas, and images circulate in and among the various sites where nutritional science is applied, including “the clinic,” “the sickroom,” and “the exhibition.” Nevertheless, the ideal of modern science became increasingly hegemonic, such that by 1930, almost all knowledge passed through a laboratory for verification, even if it originated among traditional or alternative schools of thought.

Conventional experts’ nutritional advice

Let us begin on one end of the continuum of nutritional knowledge, with mainstream scientists’ recommendations about what and how a healthy person should eat. In 1890, the reigning nutritional paradigm in Germany was the quantitative calorie paradigm (*Kalorienlehre*) of the Munich School of Metabolism.¹²¹ Established in the 1850s by chemist Justus von Liebig

¹¹⁹ The individual as expert on his or her own eating and digestion has ancient roots. See e.g. Steven Shapin, “The Long History of Dietetics: Thinking about Food, the Self, and Knowledge” (keynote delivered at the annual meeting of the DGMNT, Maastricht, Netherlands, 24-26 September 2010).

¹²⁰ The classic work for this approach is Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Milton Keynes: Open University Press, 1987).

¹²¹ For general histories of the science of nutrition: Elmer Verner McCollum, *A History of Nutrition: The Sequence of Ideas in Nutrition Investigations* (Boston: Houghton Mifflin & The Riverside Press, 1957); Edith Heischkel-Artelt, ed., *Ernährung und Ernährungslehre im 19. Jahrhundert. Vorträge eines Symposium am 5. und 6. Januar 1973 in Frankfurt am Main* (Göttingen: Vandenhoeck & Ruprecht, 1976); Harmke Kamminga and Andrew Cunningham, eds., *The Science and Culture of Nutrition, 1840-1940* (Atlanta: Rodopi, 1995); Joseph L. Barona, *The Problem of Nutrition: Experimental Science, Public Health and Economy in Europe 1914-1945* (New York: P. I. E.

(1803-1873), embryologist Theodore Bischoff (1807-1882), and hygienist Max von Pettenkofer (1818-1901) at the Munich Physiological Institute of the Bavarian Academy of Sciences, the Munich School reached its apogee under physiologist Carl von Voit (1821-1908) and is still best known for the high-protein diet recommendation associated with Voit's name.¹²²

Based on calculations made with data from the respirator chamber the size of a small room that Pettenkofer had designed, the group concluded that a man of average mass (70 kg or 154 lb) doing moderate work needs to eat 3,100 calories per day. These calories ideally should be divided into 500 grams of carbohydrates, 56 grams of fat, and 118 grams (¼ lb) of protein.¹²³ Women require about 80% of these amounts, men who do much physical labor more, and men who do primarily intellectual work less. Small children need proportionally less, while growing young people need more calories despite their relatively small size. These numbers regularly appeared in nutritional advice to physicians and laypeople, usually calibrated to a 70-kilogram man ("the Voit standard"), and with two consequences. First, readers had to do the appropriate calculations for the nutritional needs of "non-standard" bodies themselves. Second, the debates over the protein minimum waged around 1900 were often fought over a theoretical construct that bore only a passing relationship to the size and activity levels of the majority of German bodies, which were younger, older, female, heavier, etc. Indeed, almost immediately after the Munich group announced their findings, other scientists published results to refute such a high protein

Peter Lang, 2010).

¹²² Frederic Lawrence Holmes, "The Formation of the Munich School of Metabolism," in *The Investigative Enterprise: Experimental Physiology in Nineteenth-Century Medicine*, ed. William Coleman and Frederic Lawrence Holmes, 179-210 (Berkeley: University of California Press, 1988). For a critical look at Liebig's earlier work in Giessen, see Joseph S. Fruton, "The Liebig Research Group: A Reappraisal," *Proceedings of the American Philosophical Society* 132, no. 1 (March 1988): 1-66; and William H. Brock, *Justus von Liebig: The Chemical Gatekeeper* (Cambridge: Cambridge University Press, 1997).

¹²³ Uwe Heyll, "Der 'Kampf ums Eiweißminimum,'" *DmW* 132 (2007): 2768-2773; Kenneth J. Carpenter, *Protein and Energy: A Study of Changing Ideas in Nutrition* (Cambridge: Cambridge University Press, 1994). William Prout (1785-1850) is generally credited with recognizing the three major dietary macromolecules, "saccharine, oily, and albuminous divisions" (carbohydrates, fats, and proteins): McCollum, *A History of Nutrition*, 88; Barbara Orland, "The Invention of the Nutrient. William Prout, Digestion and Alimentary Substances in the 1820s," *Food & History* 8, no. 1 (2010): 149-170.

minimum. Reform nutritionists countered the prejudice toward meat by arguing that plant-derived protein (i.e. from legumes or whole grains) was just as good as or maybe better than animal-derived protein, due to its basic pH (>7), its closeness to the energy of the sun, and/or its purity from contamination by “products of decay” from the slaughter process.¹²⁴

Protein had long been a particular riddle for scientists. How did herbivores derive their animal bodies from plant matter? What made meat nutritious? Was it possible to eat too much of it? In 1805, two French scientists had realized that nitrogenous substances could be broken down into smaller and simpler “building blocks.”¹²⁵ Yet, there was confusion until the end of the century about whether these smaller units (e.g. glycine, leucine, tyrosine) were further reducible to a universal product of protein digestion, which University of Leipzig biochemist Carl Gotthelf Lehmann (1812-1863) called “peptone” in 1853.¹²⁶ Although Scandinavian chemists Gerardus Johannes Mulder (1802-1880) and Jöns Jakob Berzelius (1779-1848) had proposed the word “protein” in 1838 from the Greek word *proteios* (primary), to indicate the importance of this substance, Germans continued to use *Pepton*, *Albumin*, and *Eiweiß* interchangeably for what in English goes by the name “protein.” (Albumin is the most abundant protein in egg whites.) The current term for those building blocks, “amino acid” (*Aminosäure*), was not coined until 1898, and only in the first decade of the twentieth century did biochemist Emil Fischer (1852-1919) make his important contributions to understanding their properties.¹²⁷

In the 1880s, Max Rubner (1854-1932) became the leading voice in the physiology of

¹²⁴ For example, Felix Birch-Hirschfeld (1842-1899), Nathan Zuntz (1847-1920), and Eduard Pflüger (1829-1910), who was still arguing for Liebig’s old assertion that protein had to be absorbed and incorporated by tissues before it could enter active metabolism (i.e. be broken down again). McCollum, *A History of Nutrition*, 123-132; Carpenter, *Protein and Energy*, 55-118.

¹²⁵ They were Louis Nicolas Vauquelin (1763-1829) and Pierre Jean Robiquet (1780-1840). McCollum, *A History of Nutrition*, 173.

¹²⁶ McCollum, *A History of Nutrition*, 68.

¹²⁷ Carpenter, *Protein and Energy*, 124-127.

work and calories, and by the 1890s, he was the doyen of German nutritional science.¹²⁸ From the heights of various influential academic and public positions, his changing opinions on the “protein minimum” (a term he coined in 1908) influenced research, dietetics, and policy in Germany and elsewhere.¹²⁹ Emphasizing a bioenergetics approach to metabolism, Rubner showed that one calorie contains the same amount of energy whether it comes from carbohydrate, fat, or protein (the isodynamic law) but that the energy content of these macromolecules differs by their mass. Thus, proteins and carbohydrates produce 4.1 kilocalories per gram (kcal/g), while fat generates 9.3 kcal/g—values nutritionists still use today.¹³⁰ He also demonstrated that the first law of thermodynamics (the conservation of energy) pertains to animal metabolism and that an animal’s basal metabolic rate is proportional to its surface area. He thought this last observation was his most important contribution to nutritional research.

Just as Justus von Liebig had applied organic chemistry to animal physiology, so Max Rubner applied individual physiology to human society in the name of “rational nutrition.” At the forefront of food biopolitics in early twentieth-century Germany, Rubner combined his training in quantitative methods with progressive bourgeois notions about biological and economic efficiency and performance.¹³¹ For instance, he lamented in 1903 that “[t]he

¹²⁸ Most famously, Rubner co-founded and led the Kaiser Wilhelm Institute for the Physiology of Work (*Kaiser-Wilhelm-Institut für Arbeitsphysiologie*) from 1913 to 1926. William H. Chambers, “Max Rubner (June 2, 1854–April 27, 1932),” *Journal of Nutrition* 48, no. 1 (1 Sept. 1952): 1–12. For an survey of this institution in the twentieth century, see Theo Plessner and Hans-Ulrich Thamer, eds., *Arbeit, Leistung und Ernährung: vom Kaiser-Wilhelm-Institut für Arbeitsphysiologie in Berlin zum Max-Planck-Institut für Molekulare Physiologie und Leibniz-Institut für Arbeitsforschung in Dortmund* (Stuttgart: Steiner Verlag, 2012).

¹²⁹ For a period before World War I, Rubner advocated lower daily protein intake and non-animal sources: Max Rubner, *Volksernährungsfragen* (Leipzig: Akademische Verlagsgesellschaft, 1908), esp. 88–113, 125–135.

¹³⁰ Max Rubner, *Gesetze des Energieverbrauchs bei der Ernährung* (Leipzig: F. Deuticke, 1902); *ibid.*, *The Laws of Energy Consumption in Nutrition*, trans. Allan Markoff and Alex Sandri-White, ed. Robert J. T. Joy (Natick, MA: US Army Research Institute of Environmental Medicine, 1968).

¹³¹ He was president of the Imperial Health Council (*Reichsgesundheitsrat*, from 1893), a Privy Medical Councilor (from 1897), co-author of the *Lehrbuch der Hygiene* (1890–1907), co-editor of the *Archiv für Hygiene und Bakteriologie* (from 1892), and wrote numerous books for policymakers, fellow scientists, and interested laypersons. Corinna Treitel, “Max Rubner and the Biopolitics of Rational Nutrition,” *Central European History* 41, no. 1 (March 2008): 1–25, here 1.

population (*Volk*) ascribes [meat] with the special characteristic of providing strengthening nutrition but overestimates it in this respect. One cannot prove such a strengthening effect from the stand-point of physiology.”¹³² In 1913, he bemoaned the “hidden hunger” of Germany’s urbanizing populations, who spent disproportionately large amounts of their meager incomes on meat, whereas they could receive more calories *and* more protein if they would purchase cheaper—but less prestigious—sources of plant protein, like potatoes and rye bread.¹³³ However, his experience as a national nutritional advisor during World War I confirmed his commitment to quantifiable nutrition and caused him to throw his weight behind a high-protein minimum from animal sources in order to make good the damage done by years of inadequate nutrition.¹³⁴

Proponents and opponents of the high Voit-Rubner protein standard were not merely trying to ascertain a biological maxim; they drew nutritional science into larger debates. As part of the “social question” in industrialized parts of Germany, union organizers and working-class laborers argued that employers should increase wages so that workers could afford to buy enough meat to reach 118 grams per day.¹³⁵ (Rubner calculated that on the eve of World War I, the average urban German consumed 183 grams [0.4 lb] of meat daily.¹³⁶) Some commentators defended the eating of (cooked) meat as a mark of civilization, and Rubner had “declare[d] that a large proteid allowance is [a luxury but] the right of civilized man.”¹³⁷ Others found meat-eating

¹³² “Im Volk schreibt man ihnen die besondere Eigentümlichkeit, eine kraftige Nahrung zu liefern, zu, überschätzt sie aber dabei in ihrer Wirkung. Eine solche besondere kraftverleihende Wirkung vermag man vom physiologischen Standpunkt nicht nachzuweisen.” Rubner, “Die Lebensmittel,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden and George Klemperer, 2. Aufl., vol. 1, 81-112 (Leipzig: Georg Thieme, 1903), 84.

¹³³ Treitel, “Max Rubner and the Biopolitics of Rational Nutrition,” 13f.

¹³⁴ E.g. Max Georg Beninde and Max Rubner, *Hungerblockade und Volksgesundheit* (Berlin: Schoetz, 1920).

¹³⁵ Treitel, “Max Rubner and the Biopolitics of Rational Nutrition,” 12-13.

¹³⁶ Max Rubner, *Wandlungen in der Volksernährung* (Leipzig: Akademische Verlagsgesellschaft, 1913), 112.

¹³⁷ As paraphrased in Graham Lusk, *The Elements of the Science of Nutrition* (Philadelphia: W.B. Saunders, 1906), 179. The American physiologist (1866-1932) relied heavily on Rubner’s research when writing *The Elements of the Science of Nutrition*, which he dedicated to Carl von Voit.

barbaric or even dangerous in large quantities,¹³⁸ and vegetarians repeatedly complained that the only way to consume the recommended amount in one day would be to get it in denser, animal-based foodstuffs.¹³⁹ “Alternative” researchers such as Russell Henry Chittenden (1856-1943) in the United States, Mikkel Hindhede (1862-1945) in Denmark, and Ragnar Berg (1873-1956) and Carl Röse (1864-1947) in Dresden/Erfurt did studies on themselves and on volunteers to demonstrate that human bodies could survive and thrive on little or no animal protein.¹⁴⁰ Despite their results, mainstream medicine rejected vegetarianism, raw foodism, and “fads” in favor of a balanced or mixed diet (*Mischkost*) of meat and other animal products (milk, butter, cheese); potatoes and grains (breads, gruels, pastas); boiled vegetables and legumes; fruit (generally cooked as compote); and moderate amounts of alcohol, coffee, and tea.

The science of digestion

But eating was never just a question of *what*, it also concerned *how* and *when*; at the same time those scientists were devoting their attention to quantifying nutrition in terms of calories or grams, others were intensely interested in understanding more qualitative and even subjective factors, such as the influence of appetite on digestion. The French aphorism that authors across the spectrum of nutritional advice and lifestyle choices were fond of quoting—“one does not live on what one eats but on what one digests”—recognizes that meals can be rituals that accompany various social relationships, and that certain foods might hold particular, often emotional meanings (status, comfort, celebration, illness, recovery); however, it is the nutrients that actually sustain organic life. Already in the early nineteenth century, the importance of eating, of

¹³⁸ A common argument was that when protein was broken down, it produced large amounts of nitrogen-containing byproducts that had to be cleared from the blood by the kidneys, and meat was a known risk factor for gout.

¹³⁹ David Cantor and Christian Bonah, “Introduction: Meat, Medicine, and Human Health in the Twentieth Century,” in *Meat, Medicine and Human Health in the Twentieth Century*, ed. David Cantor, Christian Bonah, and Matthias Dörries, 1-31 (London: Pickering and Chatto, 2010), 11-13, 18-21.

¹⁴⁰ On vegetarian clubs that sponsored sporting events between carnivores and vegetarians, see Sabina Merta, *Wege und Irrwege zum modernen Schlankheitskult. Diätkost und Körperkultur als Suche nach neuen Lebensstilsformen 1880-1930* (Stuttgart: Franz Steiner Verlag, 2003), 61.

putting food in one's mouth, chewing, and swallowing, was being reduced to the physiological process of digestion, whereby the body breaks down foodstuffs into their particulate and composite parts. This is a telescopic perspective.

In the interest of the “food economy” of their bodies, therefore, individuals were supposed to take certain steps to facilitate or even enhance the digestibility of their meals. One widespread belief was that foods that looked, smelled, and tasted good—such as soups—stimulated the nerves that controlled the production and secretion of gastric juices, thereby enhancing the breakdown of food into monosaccharides, amino acids, and fatty acids that the body could absorb.¹⁴¹ This is why a proper (read: middle- or upper-class) midday meal or formal dinner began with a savory soup course: an appropriate initial investment would pay off with a higher yield of calories and nutrients. Good physiology (digestion, absorption) also depended on “a good table” (aesthetics). Other common recommendations were to eat meals punctually and to avoid consuming dishes or drinks that were “too hot” or “too cold,” as these habits would disrupt the dynamics of the digestive process or damage the delicate mucosa lining the gastro-intestinal tract. Digestion was supposed to be strongest in the middle of the day, so the typical German ate a cold breakfast, a large, hot lunch, and a small dinner with one or two coffee or beer breaks between meals.¹⁴² Many of these dietary recommendations conformed to contemporary medical trends, which emphasized nervous health and, to a lesser extent, “internal secretions” (hormones).¹⁴³

¹⁴¹ A minority of voices argued soup adversely diluted the gastric juices and should be served thick or not at all: Josef Wiel, *Diätetisches Koch-Buch mit besonderer Rücksicht auf den Tisch für Magenkranke*, 6. Aufl. (Freiburg i.B.: Wanger, 1886), 270; Theo Hoppe, “Etwas über Appetit und Bekömmlichkeit,” *Dresdner Hausfrau* 18, no. 26/27 [March/April 1920]: II; Dr. F., “Ist Suppe nahrhaft?” *DH* Nr. 1150 (24 Sept. 1924): II.

¹⁴² E.g. Otto Dornblüth, *Diätetisches Kochbuch*, 2. Aufl. (Würzburg: A. Stubers & Curt Kabitzsch, 1905), 139-144.

¹⁴³ Geoffrey Campbell Cocks, *The State of Health: Illness in Nazi Germany* (Oxford: Oxford University Press, 2012), 29-32; Mark S. Micale, *Approaching Hysteria: Disease and its Interpretations* (Princeton: Princeton University Press, 1995); Edward Shorter, “Private Clinics in Central Europe, 1850-1933,” *Social History of Medicine* 3, no. 2 (1990): 159-195.

By 1890, scientists had a fairly sophisticated knowledge of both the biochemistry and the physiology of digestion. They knew that the salivary enzyme amylase (or ptyalin) breaks down starch into smaller carbohydrate fragments. This fact was often trotted out to buttress etiquette mavens' admonishments to chew food properly, since digestion begins in the mouth.¹⁴⁴ As a matter of fact, the folksy saying "well-chewed is half-digested" (*Gut gekaut ist halb verdaut*) is still common in Germany.¹⁴⁵ It was also common to hear that not to chew one's food well amounted to economic and nutritional waste.¹⁴⁶ Gastric juice was correctly described as coming from glands in the stomach and containing both hydrochloric acid (HCl) and pepsin, a protein-cleaving enzyme (*Ferment*). However, despite French experimentalist Claude Bernard's (1813-1878) groundbreaking work on the liver's role in storing carbohydrates and on various digestive fluids, pancreatic secretions proved more vexing.¹⁴⁷ Researchers knew from clinical and laboratory observations that pancreatic insufficiency disturbed both protein and fat digestion. In fact, it was in the course of refining this understanding that Josef Freiherr von Mering (1849-1908) and Oskar Minkowski (1858-1931) completely extirpated the pancreas from a dog and discovered the association of that organ with the carbohydrate disorder diabetes mellitus in 1889. However, identification of the responsible "internal secretion" (insulin) eluded researchers for another three decades.¹⁴⁸

Around 1880, the word *Enzym* had entered the German language, but the idea of a

¹⁴⁴ Johann Friedrich Wilhelm Schilling, *Die Verdaulichkeit der Nahrungs- und Genußmittel auf Grund mikroskopischer Untersuchungen der Faeces* (Leipzig: Hartwig und Sohn, 1901), 11; Anna Fischer-Dückelmann, *Die Frau als Hausärztin*, 2. Jubiläums-Pracht-Ausgabe (Stuttgart: Süddeutsches Verlags-Institut, [1907?]), 29-30.

¹⁴⁵ Digestion might even begin when cutting up the food on one's plate, or in the process of milling grains. Wiel, *Diätetisches Koch-Buch*, 269-270; Nicholas Bauch, "The Extensible Digestive System: Biotechnology at the Battle Creek Sanitarium, 1890-1900," *Cultural Geographies* 18, no. 2 (April 2011): 209-229, here 219-220.

¹⁴⁶ This was part of the rationale behind Horace Fletcher's excessive chewing method of weight loss, which was resurrected during World War I as a food-saving mechanism. McCollum, *A History of Nutrition*, 195-196; Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 1. Aufl. (Jena: Gustav Fischer, 1918), 44-46.

¹⁴⁷ Frederic Lawrence Holmes, *Claude Bernard and Animal Chemistry the Emergence of a Scientist* (Cambridge: Harvard University Press, 1974).

¹⁴⁸ Michael Bliss, *The Discovery of Insulin* (Chicago: University of Chicago Press, 1982).

molecular tool that broke down foodstuffs had to compete with older and more familiar concepts of fermentation and rotting in the gastrointestinal tract. German physiatriist Ludwig Brieger (1849-1919) began writing about the toxic by-products of the intestinal “putrefaction” of animal proteins in 1878, and in 1885 he published an influential paper naming these “ptomaines.” “His observations led to a widespread interest in the possibility of safe-guarding human health by reducing the formation and absorption of these noxious products from the colon,” explained nutritional scientist Elmer Verner McCollum in his 1957 *A History of Nutrition*.¹⁴⁹ Mainstream medicine in Germany does not seem to have been seized with quite the epidemic of “auto-intoxication” that its Anglo-American counterpart was from about 1900 to 1940. Whereas Britons and Americans frequently made recourse to laxatives and mechanical devices to cleanse their colons with the blessing of their physicians, Germans had to turn to a fringe practitioner like Louis Kuhne (1835-1901) and his relatively benign cold-water genital baths; there was no Teutonic counterpart to London’s Sir William Arbuthnot Lane (1856-1943), who made a regular practice of surgically removing his patients’ large intestines, “the sewage system of the human body.”¹⁵⁰ A veritable fever of bacteriology struck instead, when in the 1880s and 1890s German scientists discovered that bacteria such as *Bacillus enteritidis* and *Bacillus botulinus* were responsible for “ptomaine-poisoning.”¹⁵¹ Authors giving advice to housewives frequently emphasized the importance of cleanliness and anti-sepsis,¹⁵² while the idea of noxious intestinal poisons and *Schlacken* (toxic accumulations) lingered on the fringes of academic medicine through World War II and continue in alternative medicine to the present.¹⁵³

¹⁴⁹ McCollum, *A History of Nutrition*, 157.

¹⁵⁰ As quoted in James C. Whorton, *Inner Hygiene: Constipation and the Pursuit of Health in Modern Society* (New York: Oxford University Press, 2000), 61.

¹⁵¹ McCollum, *A History of Nutrition*, 161.

¹⁵² Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge: Harvard University Press, 1998).

¹⁵³ E.g. Otto Buchinger, *Das Heilfasten und seine Hilfsmethoden* (Stuttgart: Hippokrates, 1935); Françoise Wilhelmi

While anatomists thought they understood the size, shape, and position of the gastrointestinal organs from dissection, and while physiologists were interpreting the biochemical changes from respiratory and calorimetry measurements, neither knew much about the motor functions of these muscular tubes. Wilhelm Röntgen's (1845-1923) discovery of x-rays in 1895 and the subsequent invention of machines for their deployment in a laboratory or clinical setting literally offered researchers and physicians a new window onto the organs and processes they had been studying in cadavers, with fistulae, or with input/output experiments like those of the Munich School. X-rays allowed two curious American medical students, Walter B. Cannon (1875-1945) and Ernest Amory Codmon (1869-1940), to show how the anatomy of the stomach in living bodies differs from that in cadavers and to track gastric motility *during* digestion.¹⁵⁴ Also in 1895, Russian physiologist Ivan Pavlov (1849-1936) began his famous experiments on digestion, eventually demonstrating not only the conditional salivation reflex in dogs but also the influence of the nervous system on the gut.¹⁵⁵

Such anatomical and physiological revelations contributed to the development of the “sub-individual” layers of the telescopic body, meaning the levels in the hierarchy “below” the eating/drinking individual; these layers tended to be found “beneath” the surface appearance of the thing: organs, tissues, and cells in a human body; macromolecules, vitamins, and calories in items of food. Dresden Municipal Physician Dr. Franz Dienemann (1867-1938), in his book of wartime food advice for laypeople, described it this way: “you must understand this, that the real interior of our body is not the interior of our digestive tract. This [the inside of the gastro-

de Toledo and Hubert Hohler, *Buchinger Heilfasten. Die Originalmethode* (Stuttgart: Trias, 2010).

¹⁵⁴ Walter B. Cannon and Ernest A. Moser, “The Movements of the Food in the Esophagus,” *American Journal of Physiology* 1 (1898): 435-444; Saul Benison, A. Clifford Barger, and Elin L. Wolfe, *Walter B. Cannon: The Life and Times of a Young Scientist* (Cambridge, MA: Belknap Press, 1897), 54.

¹⁵⁵ Daniel P. Todes, *Pavlov's Physiology Factory: Experiment, Interpretation, Laboratory Enterprise* (Baltimore: Johns Hopkins, 2002).

intestinal system] really lies outside of the actual functioning organism.”¹⁵⁶ In other words, inside the human body there is a further inside. Food in the digestive tract is “in” the body, in so far as it is surrounded on all sides by human flesh. But the long continuous tube from mouth to anus does not overtly communicate with the rest of the body; substances in it are not yet “self.”¹⁵⁷ Only once food has been mashed into chyme and broken down into its constituent parts can it leave (go “outside”) the muscular tube of the gastrointestinal tract via blood and lymph vessels, pass through the gateway of the liver, and finally reach the “inner” inside of the body.

The process of digestion not only moved food from outside to inside to inner inside—a spatial transition—it also effected a hierarchical transition from the macro to the micro. The inner inside was especially the realm of cells. Dienemann explained that the amount of food a person has to eat depends on how much work he performs with his body, but “in the end our metabolism is really the metabolism of our cells. In them and through them play out all the processes in our body.”¹⁵⁸ Biologically speaking, individuals consume food and drink not for “themselves” as such, but for the billions of microscopic citizens of their cell-states. Via the connectivity of the telescopic body, therefore, the biochemistry of muscle, brain, and other cells dictated the physiological instinct to eat. This was translated into the social act of eating meals, which in turn carried higher-level cultural, political, and economic meanings and repercussions.

Different diets for different bodies

Unsurprisingly, adherents to alternative medicine and to the broader life reform movement could often be distinguished by their food and drink choices. At the fin-de-siècle,

¹⁵⁶ “Denn darüber muß Du Dir klar sein, daß das eigentliche Innere unseres Körpers noch nicht das Innere unseres Verdauungsschlauches ist. Auch dieses liegt eigentlich noch außerhalb des wirklichen tätigen Organismus.” Dienemann, *Briefe*, 48.

¹⁵⁷ Annemarie Mol, “I Eat an Apple. On Theorizing Subjectivities,” *Subjectivity: International Journal of Critical Psychology* 22, no. 1 (2008): 28-37.

¹⁵⁸ Dienemann: “unser Stoffwechsel letzten Endes eigentlich ein Stoffwechsel unserer Körperzellen. In ihnen und durch sie speilen sich alle Vorgänge in unserem Körper ab.” *Briefe*, 54.

naturopathic physician Dr. Heinrich Lahmann (1860-1905) characterized his countrymen's dietary habits as anything goes (in):

Because a man who swallows oysters and champagne, lives, and because another who eats potatoes and curds [*Quark*], also lives, most people think that it makes no difference what we eat or drink. We learn as children from our teachers that the stomach is, so to speak, a self-thinking and acting organism, a faithful servant, which separates what is bad from what is good, regardless of what we put into it. This naïve idea is still held by many physiologists or at least by people who pretend to physiological knowledge.¹⁵⁹

As we have just seen, it is not entirely true that academic physiologists and medical doctors taught complete permissiveness in regards to eating habits; whether Germans *learned* the rules of a healthful diet is harder to prove than the fact that they adapted the language of nutritional science to fit their economic and political needs. It is true that while mainstream nutritionists around 1900 preached the physical and moral virtues of good eating habits, they were less concerned about deviation toward too rich a diet than too poor. Rubner would have said that no one should eat oysters and drink champagne all the time, but neither should one (have to) confine oneself to potatoes and quark.¹⁶⁰ The scientific orthodoxy seems to have accepted a much larger range of “normal” practice and physiology than alternative practitioners generally did.

Indeed, for all their internal sectarianism and despite the multitude of theories and special therapies, alternative practitioners were united in their rejection of the reductionism, drugs, and surgery of allopathy and in their commitment to gentle remedies and the healing power of nature.¹⁶¹ “Underlying the etiologic concepts of the life reformers was the notion of a human

¹⁵⁹ Adapted from Heinrich Lahmann, *Natural Hygiene, or Healthy Blood* (Google eBook) (Swan Sonnenschein & Co, 1898), 17-18; *Die diätetische Blutentmischung (Dysämie) als Grundursache aller Krankheiten*, 9. Aufl. (Leipzig: Otto Spamer, 1899), 22.

¹⁶⁰ In fact, among mainstream physicians, oysters and champagne were supposed to be good for convalescents who needed stimulation rather than nutrition. Ernst von Leyden, “Die Ernährungstherapie in Krankheiten,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. von Leyden, 1. Aufl., vol. 1, no. 1, 234-238 (Leipzig: Georg Thieme, 1897), 238.

¹⁶¹ Robert Jütte, “The Paradox of Professionalisation: Homeopathy and Hydrotherapy as Unorthodoxy in Germany in the 19th and early 20th Century,” in *Culture, Knowledge, and Healing: Historical Perspectives of Homeopathic Medicine in Europe and North America*, ed. Robert Jütte, Guenter B. Risse, and John Woodward, 65-82 (Sheffield:

constitution that can be strengthened or weakened by dietetic habits,” explains historian Michael Hau; they intended to heal both individuals and society.¹⁶² Whereas allopaths were willing to issue recommendations for health and then to treat any pathologies that arose as deviations from a baseline, naturopaths like Lahmann or Friedrich Eduard Bilz (1842-1922) sought more health, as if to raise the baseline in an effort to avoid sickness. Their lifestyles reputedly took into account subjective measures of quality in addition to quantity. Many promoted abstention from tobacco and alcohol as well as the health and moral benefits of a low- or no-meat diet.

The dietary advice of the professional groups differed because they tended to understand physiology and pathology differently. Most mainstream physicians viewed “the body” in reductive terms, as a set of organ systems subject to external, pathological micro-organisms as well as to internal, cellular pathologies. This viewpoint is easily demonstrated by the division of Josef von Mering’s textbook anatomically from most to least common conditions, beginning outside the body with acute infectious diseases, then continuing with diseases of the respiratory system (namely tuberculosis, the chronic killer), those of the cardiovascular system, and so on through nervous system chapters (increasingly lengthy over the years) all the way to relatively rare endocrine disorders, poisons, and accidents.¹⁶³ This was a paradigm of a body that could be divided, categorized, and enumerated. Allopaths like Otto Dornblüth generally perceived and treated their patients’ bodies as closed, comprehensible units that would react to therapies in

European Association for the History of Medicine and Health Publications, 1998); Claudia Huerkamp, “Medizinische Lebensreform im späten 19. Jahrhundert. Die Naturheilmovement in Deutschland als Protest gegen die naturwissenschaftliche Universitätsmedizin,” *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 73, no. 2 (1986): 158-182. Such unity, however tenuous, helped “irregulars” withstand the attacks on their legitimacy by “regulars.”

¹⁶² Michael Hau, *The Cult of Health and Beauty in Germany: A Social History 1890-1930* (Chicago: University of Chicago Press, 2003), 110. Of the large literature on nutrition and alternative medicine in modern Germany, let me mention here just two: Elisabeth Meyer-Renschhausen and Albert Wirz, “Dietetics, Health Reform and Social Order: Vegetarianism as a Moral Physiology. The Example of Maximilian Bircher-Benner (1867-1939),” *Medical History* 43, no. 3 (July 1999): 323-341; and L. Margaret Barnett, “‘Every Man His Own Physician’: Dietetic Fads, 1890-1914,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 155-178 (Atlanta: Rodopi, 1995).

¹⁶³ Josef von Mering, ed., *Lehrbuch der inneren Medizin*, 1. Aufl. (Jena: Gustav Fischer, 1901).

predictable ways. However, drugs and surgery were not the only or necessarily the first prescriptions physicians wrote; they often prescribed dietary changes for a variety of diagnoses, from nephritis to heart failure to tuberculosis. Although scientific authors complained that laypersons believed that the sick needed to be strengthened with meat as if it contained some mystical property, they themselves continued to characterize “the sick” as weak individuals whose bodies could not digest protein in the amounts or forms (i.e. chunks of meat) that healthy bodies could; therefore, they needed limited amounts in easily digestible forms—like beef broth and beefsteak—at least temporarily (see recipe at start of Chapter 1).¹⁶⁴

By contrast, naturopaths like Heinrich Lahmann and Dr. Anna Fischer-Dückelmann (1856-1917) tended to perceive their patients’ bodies as open, dynamic, and able to heal themselves if encouraged by gentle remedies rather than irritated or damaged by drugs and surgery. They frequently divided their books for fellow professionals as well as for laypeople not anatomically but according to subject: Lahmann’s theory of dysaemia, “corpulence and anemia,” “the cause and treatment of cancer,” “childbed fever.” Scientific (i.e. biochemical, anatomical, physiological) knowledge was hardly lacking from the naturopathic volumes, as both regular and irregular scientists relied on laboratory science to prove that their version of “nature” was correct. For example, the 1907 edition of Fischer-Dückelmann’s popular household book contains numerous detailed illustrations of microscope images of tuberculosis bacilli, of the anatomy of the inner ear, and even of the embryonic development of the male and female reproductive systems.¹⁶⁵ Until about 1910, alternative practitioners were also much more

¹⁶⁴ Ernst von Leyden, “Indicationen der Ernährungstherapie,” *Handbuch der Ernährungstherapie und Diätetik*, 1. Aufl., vol. 1, no. 1, 217-281 (Leipzig: Georg Thieme, 1897), 242. Otto and Hedwig Dornblüth’s *Diätetisches Kochbuch* includes half a dozen recipes for “beefsteak”: in its classic form served with soft-boiled eggs and sardines; mixed with egg yolk and mustard as steak tartar; plain and undercooked “for the so-called English taste”; with chopped onion for the German way; or rapidly sautéed in butter for a particularly quick but easily digestible (*rasch verdaulich*) entrée. 3. Aufl. (Würzburg: Curt Kabitzsch, 1913), 144-146.

¹⁶⁵ Fischer-Dückelmann, *Die Frau als Hausärztin*, 62, 37, 41, 44.

invested in popularizing hygiene and biological knowledge than mainstream authorities were.¹⁶⁶

The difference was that natural health practitioners interpreted such illustrations in terms of the vital powers of the body in equilibrium with its environment.¹⁶⁷ To them, sick bodies were bodies out of balance; accordingly, the treatments they prescribed were intended to restore biochemical balance (through diet and baths), energy balance (through magneto- and light therapy), or musculoskeletal balance (through massage and calisthenics).¹⁶⁸ Many also sought to cleanse the body of the toxins such as acids, heavy metals, or metabolic byproducts circulating in the fluids or precipitated in the tissues that imbalanced the organism. Naturopaths saw human bodies as capable of healing themselves, but they also bemoaned the conditions that prevented this: wrong-headed scientific “advice,” bad habits encouraged by modern living, and simple ignorance. Only individuals educated about hygiene, rational diet, and the healthful effects of light, air, and water would be able to attain and maintain health. In this way, naturopathy was a natural and expected outgrowth of the culture of self-help in the late nineteenth century, part of the continuum of nutritional knowledges and practices from laboratory to kitchen.¹⁶⁹

Bread and butter and margarine

We can track the influence of research on nutritional standards outside the laboratory in the effect of the discovery and acceptance of vitamins on the common food pairing of bread and butter. Interest in what biochemist Casimir Funk (1884-1967) in 1912 called “vitamines” (vital + amines) extended back at least to the mid-eighteenth century, when ship surgeon James Lind

¹⁶⁶ Cornelia Regin, *Selbsthilfe und Gesundheitspolitik: die Naturheilbewegung im Kaiserreich, 1889 bis 1914* (Stuttgart: Franz Steiner, 1995).

¹⁶⁷ Florentine Fritzen, *Gesünder leben: die Lebensreformbewegung im 20. Jahrhundert* (Stuttgart: Steiner, 2006); Judith Baumgartner, *Ernährungsreform—Antwort auf Industrialisierung und Ernährungswandel. Ernährungsreform als Teil der Lebensreformbewegung am Beispiel der Siedlung und des Unternehmens Eden seit 1893* (Frankfurt am Main: P. Lang, 1992).

¹⁶⁸ Avi Sharma, *We Lived for the Body: Natural Medicine and Public Health in Imperial Germany* (DeKalb, IL: NIU Press, forthcoming).

¹⁶⁹ Hau, *The Cult of Health and Beauty*; Gunnar Stollberg, “Die Naturheilvereine im Deutschen Kaiserreich,” *Archiv für Sozialgeschichte* 28 (1988): 287-305.

(1716-1794) supplemented the British Royal Navy's salted meat and biscuit rations with sauerkraut and fresh citrus fruit.¹⁷⁰ But mainstream experts before World War I generally downplayed the dietary importance of fruits and vegetables as seasonal, low in calories and nitrogen, high in indigestible bulk, and some quite possibly poisonous when raw.¹⁷¹ In 1890 there was no systematic theory for appreciating "accessory dietary factors," although both Japanese and Dutch researchers were working on the question of beriberi.¹⁷² Meanwhile, naturopaths and vegetarians championed the closeness of fresh produce to nature and the soil, its nutrient salts (*Nährsalze*), and the relative cheapness of potatoes over meat.¹⁷³ In fact, the antagonism between regular and irregular practitioners might have contributed to the length of time it took for the vitamin to join the calorie as a pillar of nutrition. Only with Frederick Gowland Hopkins' (1861-1947) article "Feeding Experiments Illustrating the Importance of Accessory Food Factors in Normal Diets" (1912), in which the biochemist laid out clear experimental proof that a healthful diet required more than calories and protein, did researchers like Rubner begin to consider them seriously.¹⁷⁴ World War I both stimulated and interrupted research on vitamins (and minerals), which neither the scientific mainstream nor the public generally accepted until the 1920s.

¹⁷⁰ McCollum, *A History of Nutrition*, 95; R. E. Hughes, "James Lind and the Cure of Scurvy: An Experimental Approach," *Medical History* 19, no. 4 (Oct. 1975): 342-351.

¹⁷¹ On the danger of raw fruit for pregnant women, especially on an empty stomach in the morning, Dornblüth, *Diätetisches Kochbuch* (1905), 334; (1913), 460. "It wasn't so long ago that raw fruit would be taken out of the hands of children as hazardous to their health [*gesundheitsschädlich*]: it had to be cooked first. ... Today we know that raw fruit is indispensable for the development of children's bodies and give it in appropriate forms and amounts even to small children." Henriette Davidis and Ida Schulze, *Das neue Kochbuch für die deutsche Küche*, 3. Aufl. (Bielefeld und Leipzig: Verlag von Velhagen und Klasing, 1935), 220.

¹⁷² Alexander R. Bay, *Beriberi in Modern Japan: The Making of a National Disease* (Rochester, NY: University of Rochester Press, 2012).

¹⁷³ Eva Barlösius, "Vegetarische Kochbücher," in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuch Museum*, ed. Gisela Franke, 287-302 (Bielefeld: Regionalgeschichte, 1998).

¹⁷⁴ All told, Liebig's ideas about energy (carbohydrates and fats), protein (building block and muscle force), and the necessity of a few minerals from the soil persisted for about sixty years. Kenneth J. Carpenter, Alfred E. Harper, and Robert E. Olson, "Experiments that Changed Nutritional Thinking. Proceedings of a Minisymposium. Atlanta, GA, April 1995 and Washington, DC, April 1996," *Journal of Nutrition* 127, no. 5 Suppl. (May 1997): 1017S-1053S.

This “newer knowledge” upended much conventional nutritional advice. Food chemists like Carl Arthur Scheunert (1879-1957) and Alfred Robert Heiduschka (1875-1957) led a new generation of experts that valued plant-based foods (especially vegetables) at least as much as the previous generation had valued animal-based ones (especially meat). They trumpeted calorie-, protein-, and carbohydrate-poor vegetables like spinach, carrots, and tomatoes as sources of *Ergänzungsstoffe* (supplementary substances) that meat and refined white bread could not provide. Some animal products—namely milk and butter—retained their privileged positions on the dining table on account of their newly discovered vitamin A and D content. Whole-grain bread and unpolished rice, which conventional scientific wisdom had considered difficult to digest, were re-defined as sources of vitamin B and “ballast” (fiber). Leafy green vegetables were touted for their “anti-scurvy” (vitamin C) activity. Finally, while cookbook authors in the 1890s had instructed women to blanch most vegetables to make them more digestible and considered (stewed) fruit useful only for its variety and sugar content, by the 1910s they cautioned against blanching on account of the loss of “nutrient salts” (*Nährsalze*), and by the mid-1920s they recommended a vitamin- and mineral-rich daily diet that included some raw fruit and vegetables.

Overall standards of nutrition were increasing, and the body consciousness of the life reform movement was becoming more mainstream, thanks to the health consumerism encouraged by the Reformhäuser, Thalysia, Eden, Lahmann, and other commercial ventures for products that promised to bring their buyers “back to nature.”¹⁷⁵ Nutritionists in the 1930s paid were often more concerned about their subjects eating too much rather than too little: calories

¹⁷⁵ Fritzen, *Gesünder leben*; Baumgartner, *Ernährungsreform*; Jörg Melzer, Parts 2 and 3, *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch* (Stuttgart: Franz Steiner, 2003).

were counted not for rationing but for dieting now.¹⁷⁶ Mainstream experts' reversal on whole grains was particularly striking: whereas most physiologists had argued for decades that undigested plant fibers amounted to wasted calories, after World War I they began adopting the reform view: that bran contains vitamins (and protein), and that indigestible "bulk" prevents constipation. The consumption of rye rather than wheat was also a question of food autonomy politics, the domestic agriculture lobby, and of the national import economy, all of which was difficult to disentangle from experts' recommendations to eat more whole grains.¹⁷⁷

The recipe and advertisements that ran alongside it in a popular women's magazine with which I began this essay exemplify the kind of anatomical, physiological, and biochemical knowledge about food and eating that circulated from laboratories to kitchens and sick rooms and back again. Food manufacturers and advertisers knew that consumers cared about products that looked, smelled, and tasted good; that were healthy and safe (i.e. without adulterants, germs, or dirt); that were affordable; and that would keep before refrigeration and plastic storage containers.¹⁷⁸ So we find them touting the "total lack of acidity and germs" in margarine, the appetite-stimulating effects of bouillon or anchovies, the protein content of one spice mixture, and the ability of another to make vegetables easier to digest.¹⁷⁹

As with the debate over whole-grain versus refined flour, the opposition between butter

¹⁷⁶ Merta, *Wege und Irrwege zum modernen Schlankheitskult*, 259-268.

¹⁷⁷ Uwe Spiekermann, "Brown Bread for Victory: German and British Wholemeal Politics in the Inter-War Period," in *Food and Conflict in Europe in the Age of the Two World Wars*, ed. Frank Trentmann and Flemming Just, 143-171 (New York: Palgrave Macmillan, 2006); *ibid.*, "Vollkorn für die Führer: zur Geschichte der Vollkornbrot-politik im Dritten Reich," *Zeitschrift für Sozialgeschichte des 20. und 21. Jahrhunderts* 16, no. 1 (Jan. 2001): 91-128.

¹⁷⁸ Uwe Spiekermann, "Twentieth-Century Product Innovations in the German Food Industry," *Business History Review* 83, no. 2 (Summer 2009): 291-315; *ibid.*, "Redefining Food: the Standardization of Products and Production in Europe and the United States, 1880-1914," *History and Technology* 27, no. 1 (March 2011): 11-36; Vera Hierholzer, *Nahrung nach Norm: Regulierung von Nahrungsmittelqualität in der Industrialisierung 1871-1914* (Göttingen: Vandenhoeck & Ruprecht, 2010).

¹⁷⁹ "Brix Hansens Appetitsild, Anchovis, Gabelbissen," *Dresdner Hausfrau* 27, no. 12 (20. Dec. 1928): XVI; "An alle Hausfrauen zur Beachtung für die fleischlosen Wochen [ad for Plantox]," *DH* 17, no. 4 (27 Oct. 1918): 10; "Bullrich Salz in der Küche," *Leipziger Hausfrau* 32, no. 1 (5 Oct. 1933): XII.

and margarine provides an interesting test case for changing nutritional standards in and out of the laboratory. Invented in 1869 by French chemist Hippolyte Mège-Mouriès (1817-1880) to satisfy the needs of the imperial military, margarine is the umbrella term for a number of first animal- and then plant-based cooking fats that are soft solids at room temperature. Beginning in the 1870s and 1880s, Dutch and German scientists developed butter substitutes derived from beef fat; in the 1900s they figured out how to hydrogenate vegetable oils from sunflower seeds, soy beans, and cottonseeds.¹⁸⁰ An artificial product, margarine suffered from a low reputation compared to dairy-based butter, so some ads emphasized their brands' similarities in appearance, taste, and smell to butter but at a more affordable price.¹⁸¹ Like the Kunerona margarine advertisement on page 59, a few promoted their margarine's lack of animal fats, making it suitable for the tables of vegetarians and life reformers concerned about animal welfare.¹⁸²

Margarine consumption peaked in 1913 before trade restrictions during World War I reduced imports of raw coconut and palm oil. Price inflation and shortages of animal fats like butter and lard made margarine an attractive if scarce replacement. After the war, butter's market profile redoubled when research revealed that it naturally contains vitamins A and D and margarine does not. By the mid-1920s, however, production capabilities had improved to allow the supplementation of margarine with vitamins.¹⁸³ Then it was marketed as a constant source of these accessory factors, whereas their content in butter fluctuated with the seasons and the cows'

¹⁸⁰ For some early formularies, Sabine Merta, "Margarine in Competition with Butter in Germany (1872-1933): The Example of Van den Bergh's Margarine Factory in Kleve," in *The Food Industries of Europe in the Nineteenth and Twentieth Centuries*, ed. Derek J. Oddy and Alain Drouard, 119-132 (Farnham, Eng.: Ashgate, 2013), 120, 125.

¹⁸¹ 1/2 the price of butter before World War I, and as little as 1/3 the price in the 1920s. Paul Clark, "The Marketing of Margarine," *Journal of Advertising History* 9, no. 1 (Jan. 1986): 52-65, here 55.

¹⁸² E.g. Elise Starker, *Hygienisches Kochbuch zum Gebrauch für ehemalige Curgäste von Dr. Lahmann's Sanatorium auf Weisser Hirsch bei Dresden*, 2. Aufl. (Dresden: Alexander Köhler, 1893), 201.

¹⁸³ C.f. "Ernährungsrevolution" ad for Dr. med. Lahmanns Vitamin-Pflanzenbutter, *DH* 25, no. 11 (15 Dec. 1926): unpag.; "Man hat in England Kühe mit Lebertran gefüttert!" ad for Resi margarine, *DH* 23, no. 31 (29 April 1925): [26]; and "Zur Vitaminfrage" ad for van den Bergh's margarine, *DH* 25, no. 17 (26 Jan. 1926): XIII. See also Sally M. Horrocks, "The Business of Vitamins: Nutrition Science and the Food Industry in Inter-war Britain," in *The Science and Culture of Nutrition, 1840-1940*, ed. Harnke Kamminga and Andrew Cunningham, 235-258 (Atlanta: Rodopi, 1995).

access to pasture.¹⁸⁴ The triumph of science over nature continued in the late-twentieth century with the “diet-heart hypothesis.”¹⁸⁵ Bread and butter and margarine is just one of many examples of the interconnectedness of “the laboratory” and “the kitchen.”¹⁸⁶

Conclusion

In conclusion, what kind of spaces were German laboratories for the production of nutritional knowledge? Despite the differences between regular and irregular medicine in terms of body concepts and clinical philosophies, they increasingly shared a single ideal of laboratory-based science. Experiments were supposed to begin at a neutral starting point, involve controls, produce visual proof and/or precise calculations, and be reproducible. The scientist ought to approach the topic objectively and be willing to admit that his hypothesis was wrong if the data contradicted it. Even researchers outside the mainstream, such as Ragnar Berg, considered themselves legitimate scientists working under same assumptions as those occupying university chairs or benches in government institutes.

Nevertheless, members of both sides were willing to fudge the details in practice to arrive at the “proper” conclusions: Emil Abderhalden (1877-1950) was a respected biochemist for the half centuries before and after his death, even though he employed sloppy and subjective exper-

¹⁸⁴ Harmke Kamminga, “Vitamins and the Dynamics of Molecularization: Biochemistry, Policy and Industry in Britain, 1914-1939,” in *Molecularizing Biology and Medicine*, ed. Soraya de Chadarevian and Harmke Kamminga, 83-105 (Amsterdam: Harwood Academic Publishers, 1998), 94; Rima D. Apple, “‘To Protect the Interest of the Public’: Vitamins, Marketing, and Research,” in *Vitamina: Vitamins in American Culture* (New Brunswick, NJ: Rutgers University Press, 1996), 33-53; Sally M. Horrocks, “The Business of Vitamins: Nutrition Science and the Food Industry in Inter-war Britain,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 235-258 (Atlanta: Rodopi, 1995), esp. 239-242.

¹⁸⁵ This hypothesis began with American researchers: Todd M. Olszweski, “The Causal Conundrum: The Diet-Heart Hypothesis and the Management of Uncertainty in American Medicine,” *Journal of the History of Medicine and Allied Sciences* (published online 5 March 2014), doi: 10.1093/jhmas/jru001.

¹⁸⁶ Spiekermann, “Twentieth-Century Product Innovations”; *ibid.*, “Redefining Food”; Ulrike Thoms, “The Innovative Power of War: The Army, Food Sciences, and the Food Industry in Germany in the Twentieth Century,” in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, 244-262 (Farnham, Eng.: Ashgate, 2011).

imental procedures that more careful researchers could not replicate.¹⁸⁷ And Berg stubbornly refused to perform control experiments suggested by a mainstream colleague who had refuted his acid-base theory. Disputes over the appropriate setting for research had effects outside the laboratory, such as when governments put nutritionists' advice into national policy during World War I. On the question of the digestibility of whole grains, Max Rubner favored analytical data from samples he had collected from just two subjects over Mikkel Hindhede's impressionistic observations of three million Danish citizens forced onto a high-bran, lacto-vegetarian diet by the Allied blockade, in what was essentially a population-level experiment in "the newer ideas on nutrition."¹⁸⁸ As a result, Germans on the individual and the population level starved while even city-dwelling Danes survived the war with their health intact.¹⁸⁹

Despite these failures of application, nutritionists of all stripes increasingly looked to the laboratory as the arbiter of the best knowledge about what, how, and when to eat, for only there could the messy contexts of daily life be stripped away from eating bodies to reveal the effects of nutrients in their purest forms. Regular medicine could not cure many diseases in 1890 or in 1930, but for many on-lookers, it had demonstrated its superiority to empiricism, tradition, and "common sense" through the seemingly ever-more-precise description of anatomy and physiology in terms of tissues, cells, and molecules. Bacteriology was likewise an explanatory and diagnostic triumph that required laboratory skills and equipment. In an age of positivistic

¹⁸⁷ Ute Deichmann, "'I Detest His Way of Working.' Leonor Michaelis (1875-1949), Emil Abderhalden (1877-1950), and Jewish and non-Jewish Biochemists in Germany," in *Jews and Sciences in German Contexts*, ed. Ulrich Charpa and Ute Deichmann, 101-126 (Tubingen: Mohr Siebeck, 2007).

¹⁸⁸ Max Rubner, "Untersuchungen über Vollkornbrote," *Archiv für Physiologie* (1917): 245-372; Roelfs and Kurgas were two of Rubner's regular nutritional experiment subjects. Cf. Mikkel Hindhede, "Einfluß der dänischen Ernährungsrationierung auf den Gesundheitszustand," *DmW* 45:2, no. 45 (6 Nov. 1919): 1236-1237; Rubner, "Bemerkungen zum vorstehenden Aufsatz Hindhedes," *DmW* 45:2, no. 45 (6 Nov. 1919): 1237-1238; Hindhede, "The Effect of Food Restriction During War on Mortality in Copenhagen," *JAMA* 74, no. 6 (7 Feb. 1920): 381-382.

¹⁸⁹ Svend Skafte Overgaard, "Mikkel Hindhede and the Science and Rhetoric of Food Rationing in Denmark, 1917-1918," in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, 201-215 (Farnham, Eng.: Ashgate, 2011); Jörg Melzer, *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch* (Stuttgart: Franz Steiner, 2003), 108-112.

materialism and of social and scientific managerialism, the place to look for truth in nutrition was “down,” at the lowest levels of magnification and with the (supposed) rigor afforded by modern laboratory science. Even though the camps frequently began with different premises and ended with different conclusions, their claims about the wisdom of “nature” or the superiority of “culture” increasingly had to pass through the conceptual and experimental rigors of the laboratory on their way to the clinic, the sick room, and the kitchen. The chapters in Part I show how mainstream and alternative nutritionists increasingly employed scientific rhetoric and a telescopic perspective to argue for their preferred foodways.

Thus, Germans were exposed to a variety of knowledges about their eating and digesting bodies. They must have understood that their bodies had complicated relationships with food. Muscles, nerves, secretions, hormones, and enzymes had to coordinate to break down and assimilate the food they ate into the substance of and fuel for their bodies. Of course, some ate only what was available and affordable, while others had the free time and disposable income to learn about and practice one of several recommended diets as a lifestyle choice. They could choose, for instance, between a traditional meat- and calorie-laden *Hausmannskost* like that served in many restaurants; a low-meat diet that balanced dietary acids and bases; or a no-meat diet that emphasized the energy of the sun. These knowledges appeared on Germans’ tables in the form of a breakfast of porridge with fresh milk; or a warm midday meal served at the same time every day; or a raw salad with dinner rather than a dish of boiled vegetables in white sauce. From this plurality of “normal” eating habits came different systems for feeding the sick, the subject of Chapter 1.

Part I – Illustration



A wise man from the Orient/ Holds a carton in his hand:/ “Of all the brands one stocks,/ the palm tree deserves only this one!” Margarine. Kunerona Plant-Butter (free from animal fats). Sole manufacturer: Kunerolwerke GmbH Bremen¹⁷⁶

¹⁹⁰ “Kunerona Pflanzen-Butter,” *Dresdner Hausfrau* 11, no. 7 (15 Nov. 1912): 27.

Chapter 1: Feeding the Sick: Nutrition and Authority in the Sick Room and the Clinic

Scraped Beef (German Beefsteak) for 2 persons

Ingredients:

½ kg shaved beef,
150 g butter,
2 onions,
2 tablespoons water,
salt and pepper to taste.

One takes ½ kg lean, tendon-free beef, puts it through a meat grinder and mixes it with two tablespoons of cold water. Then one forms round, finger-thick patties from it, sprinkles them with salt and some pepper, and fries them in browned butter over a strong fire for two minutes on each side. In the remaining butter one then quickly browns two onions chopped in fine cubes, pours some water in the pan and then the sauce over the beef, which is therefore best served in a deeper bowl.¹⁹¹

Garden Lettuce Salad

Prepare the lettuce leaves, but split the ribs and use them as well. Only wash the lettuce shortly before its use, 3-4 times, and let it drip dry. It may not be left lying in water, because otherwise too much of the juice will be leached out. When serving first pour on the oil (olive oil), swish the lettuce well in it and dribble the lemon juice (1 spoonful for 2 spoons of oil) over it, add 1 spoonful of sugar and mix the salad well.¹⁹²

¹⁹¹ “Geschabtes Rindstück (Deutsches Beefsteak). Bestandteile (2 Personen): ½ kg schieres Rindfleisch, 150 g Butter, 2 Zwiebeln, 2 Eßlöffel Wasser, Salz und Pfeffer nach Geschmack. Man nimmt ½ kg mageres, sehnenfreies Rindfleisch, läßt es durch die Fleischhackmaschine gehen und vermischt es mit zwei Eßlöffeln kaltem Wasser. Dann formt man runde fingerdicke Scheiben davon, bestreut sie in der vorher gebräunten Butter auf starkem Feuer auf jeder Seite zwei Minuten. In der zurückgebliebenen Butter bräunt man dann schnell zwei in feine Würfel geschnittene Zwiebeln, gießt etwas Wasser in die Pfanne und tut dann die Tunke über die Rindstücke, die daher am besten in einer tieferen Schüssel angerichtet werden.” Otto Dornblüth and Hedwig Dornblüth, *Diätetisches Kochbuch*, 3. Aufl. (Würzburg: Curt Kabitzsch, 1913), 144-145.

¹⁹² “125. Kopfsalat. Man verliest den Salat, wobei man aber die Blattrippchen gespalten mit verwendet. Gewaschen wird der Salat erst kurz vor dem Gebrauch und zwar 3-4 Mal, worauf man ihn gut abtropfen lässt. Im Wasser liegen bleiben darf derselbe durchaus nicht, da sonst der Saft zu sehr ausgelaugt würde. Beim Anmachen giesst man zuerst das Oel (Olivenöl) daran, schwengt den Salat gut darin um und träuft nun den Citronensaft (1 Löffel voll auf 2 Löffel voll Oel) darüber, giebt 1 Löffel voll Zucker dazu und macht den Salat durcheinander.” Elise Starker, *Hygienisches Kochbuch zum Gebrauch für ehemalige Curgäste von Dr. Lahmann's Sanatorium auf Weisser Hirsch bei Dresden*, 16. Aufl. (Dresden: Alexander Köhler, 1905), 40.

“At the start of my work I read with admiration the famous book [on nutrition] by Professor [Ernst] von Leyden and then thought a lot about how I could serve science. I wanted to pave the way for it in the field of public health and healthy eating in the life of the family. I followed this path for years as a contributor to *Public Health and Hygiene Magazine*. The last building block is my book *Dietary Cooking*, which appeared last year and in which the recipes—especially for metabolic diseases and diabetes—are specifically crafted in their ingredients and their flavor according to medical prescriptions. I wanted to rescue the sick from their monotonous diet,” [Hedwig Heyl] said, laughing. Her gaze sought the horizon, as if she stood at so many sick beds where the housewife was serving delicious food to the patient—perhaps according to one of her recipes.¹⁹³

Elise von Hopffgarten (1869-1937) published this anecdote in a women’s magazine on the occasion of her friend and colleague’s eightieth birthday. Hedwig Crüsemann Heyl (1850-1934)—educator, author, organizer, and local politician—was reminiscing about her influence on the field of nutrition for the healthy and the sick. Thanks to her intelligence, charm, and leadership capabilities, this young widow and mother of five children had become an authority in the new field of domestic science. One biographer wrote of her first best-seller, *The ABCs of the Kitchen* (1888), that “probably for the first time scientific knowledge of nutrition was the basis of everyday cooking practice.”¹⁹⁴ The last chapter of this general cookbook was published separate-

¹⁹³ “Diese Anerkennung [Dr. med. h. c. from Uni. Berlin] war ihr eine besondere Freude, ‘denn’—sagte sie damals und auch kürzlich, als wir plauderten—‘im Anfang meiner Arbeit las ich mit Bewunderung das berühmte Buch von Professor von Leyden und dachte damals viel darüber nach, wie ich der Wissenschaft dienen und ihr Wege auf dem Gebiet der Volkshygiene und der gesunden Ernährung in das Leben der Familie ebnen könnte. Diese Wege ging ich dann als jahrelange Mitarbeiterin der “Blätter für Volkshygiene und Volksgesundheit”—und der letzte Baustein ist mein vorjährig erschienenenes Buch “Diätküche,” wo die Rezepte besonders für Stoffwechsel- und Zuckerkrankte nach den ärztlichen Vorschriften genau in ihren Zutaten und auf ihre Schmackhaftigkeit hin berechnet sind. ‘Ich wollte gern den Kranken von ihrer eintönigen Kost weghelfen,’ sagte sie lächelnd und ihr Blick suchte das Weite, als stände sie an vielen Krankenbetten, wo die Hausfrau dem Patienten—vielleicht nach einem ihrer Rezepte—ein schmackhaftes Essen darreicht.” Elise von Hopffgarten, “Plauderstunden mit Dr. Hedwig Heyl,” *Dresdner Hausfrau* 28, no. 31 (1 May 1930): [14].

¹⁹⁴ Elisabeth Heimpel: “das wohl zum ersten Male wissenschaftliche Erkenntnisse der Ernährungslehre der Praxis des täglichen Kochens zugrunde legte.” “Heyl, Hedwig, geborene Crüsemann,” in *Neue Deutsche Biographie* [online] vol. 9, 83-84 (1972), accessed 15 March 2012, <http://www.deutsche-biographie.de/pnd118979965.html>; see also Ilse Reicke and Hedwig Heyl, *Das tätige Herz. Ein Lebensbild Hedwig Heyl* (Leipzig: Herrmann Eichblatt, 1938). Heyl developed *Das ABC der Küche* while teaching working-class girls and women at her husband’s chemicals factory how to cook. The cookbook went through fourteen editions (Berlin: Carl Habel, 1888-1938),

ly the next year as the first of Heyl's two manuals on home-based medical dietetics.¹⁹⁵

So it is interesting to see that in this conversation, Heyl misremembers how her career began. She credits internist Ernst von Leyden's *Handbook of Nutritional Therapy and Dietetics* (1897-1898) for her inspiration, although it appeared a decade after she began publishing.¹⁹⁶ Heyl wrote her original chapter about food for the sick (*Krankenkost*) "at the request of several doctors with whom [she] was friendly" and re-published it "for those who concern themselves with the care and especially the feeding of suffering persons," presumably nurses, mothers, and wives tending to the infirm and/or elderly at home.¹⁹⁷ In it, she establishes a division of authority between the physician, who chooses the amounts and kinds of foods in the patient's diet, and the cook or caretaker, who prepares and serves the dishes using tips and recipes from her book. In both her recommendations and her reminiscences, Heyl defers to the status and expertise of physicians, despite her years of personal and professional experience and acclaim—including an honorary medical degree from the University of Berlin in 1920. This episode reflects both her modesty and conservatism and the co-dependence of mostly male spheres of influence (laboratory science, clinical medicine) and mostly female ones (the kitchen, the sick room).¹⁹⁸

including a posthumous one prepared by her daughter, Rose H. Heyl (*1880).

¹⁹⁵ Hedwig Heyl, *Die Krankenkost* (Berlin: Carl Habel, 1889); and *ibid.*, *Diätküche* (Berlin: Carl Habel, 1929). The ingredient amounts and price suggestions are for single servings, so we can assume they were intended for private, in-home nursing rather than for use in institutions with large numbers of patients like hospitals or sanatoria. For a survey of dietetic cookbooks see Ulrike Thoms, "Diätetische Kochbüche," in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 269-286 (Bielefeld: Regionalgeschichte, 1998).

¹⁹⁶ Ernst von Leyden, ed., *Handbuch der Ernährungstherapie und Diätetik*, 1. Aufl., 2 vols. (Leipzig: Georg Thieme, 1897-1898).

¹⁹⁷ "Das letzte Kapitel des 'ABC der Küche' ist auf den Wunsch einer Anzahl befreundeter Ärzte geschrieben worden, auch deren Ansicht die genauen Angaben der Bereitungsweise der Krankenkost im Interesse der Kranken gleich wichtig für die Ärzte wie für solche sei, welche sich mit der Pflege, insbesondere der Ernährung der leidenden Menschheit beschäftigen." Heyl, *Krankenkost*, 1. We know this small book was intended for private, in-home nursing, because it calculates recipe amounts and price guidelines for a single patient rather than the large groups that would have been found in an institution.

¹⁹⁸ Cornelia Osborne, "Women Doctors and Gender Identity in Weimar Germany (1918-1933)," in *Women and Modern Medical Education*, ed. Lawrence Conrad and Anne Hardy, 109-126 (New York: Rodopi, 2001); Thomas Neville Bonner, *To the Ends of the Earth: Women's Search for Education in Medicine* (Cambridge, MA: Harvard University Press, 1992), 43, 63, 101-119; Karen Nolte, "The Relationship between Doctors and Nurses in Agnes Karll's Letters around 1900," *Women's History Magazine* 65 (Spring 2011): 9-17; Ulrike Thoms, "Zwischen Koch-

The “monotonous diet” from which Heyl wanted to save patients was probably a “low” diet rooted in ancient ideas about heat and cold that made intuitive sense in the context of Western medicine well into the nineteenth century.¹⁹⁹ Hippocrates (c. 460 BCE- c. 370 BCE) had reputedly prescribed a simple strained barley water or “tisane” for fever patients in order to provide them palatable nourishment while their bodies healed themselves. Recognizable forms of such (neo)humoral dietetics persisted at least until the rise of heroic medicine in the late-eighteenth century, at which point a strain of therapeutic nihilism evolved among learned physicians who felt it was better to do nothing than to harm the patient.²⁰⁰ During this period, German hospitals commonly served thin “soups for the sick” (*Krankensuppen*) to their patients, mostly the destitute or working poor who had no one to look after them at home; this meager diet was simultaneously economical and therapeutically indicated by both neohumoralism and nihilism.²⁰¹

In the middle of the nineteenth century, both a variety of therapeutic schools and modern nutritional science developed in Germany. Naturopaths, homeopaths, hydropaths, and other practitioners marketed themselves as alternatives to mainstream physicians who offered either strong medicine or only symptomatic care, and they frequently promised to cure cases declared

topf und Krankenbett. Diätassistentinnen in Deutschland 1890-1980,” *Medizin in Geschichte und Gesellschaft* 23 (2004): 133-163. Women audited German medical classes from the late 1880s; state licensure was opened to them in 1899; and German medical schools began admitting them in 1900. Nevertheless, the number of practicing female M.D.s remained low throughout this period. Meanwhile, alternative medicine was more welcoming of women. Nursing professionalized in the late 1800s and dietetics in the interwar period, both as “female” fields.

¹⁹⁹ Julius Petersen, “Zur Geschichte der Ernährungstherapie,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden, 1. Aufl., vol. 1, no. 1, 1-19 (Leipzig: Georg Thieme, 1897). See also J. Worth Estes, “Food as Medicine,” in *The Cambridge World History of Food*, ed. Kenneth F. Kiple and Kriemhild Coneè Ornelas, 1534-1553 (Cambridge, Cambridge University Press, 2000); Karl E. Rothschild, “Krankenkost in alten Tagen,” *Deutsches medizinisches Journal* 12, no. 5 (5 March 1961): 117-123; and Henry E. Sigerist, “The History of Dietetics. 1941,” *Gesnerus* 46, no. 3-4 (1989): 249-256.

²⁰⁰ Jörg Melzer, Parts 1 and 2, *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch* (Stuttgart: Franz Steiner, 2003); William F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge: Cambridge University Press, 1994), 13-14.

²⁰¹ Ulrike Thoms, *Anstaltskost im Rationalisierungsprozess: Die Ernährung in Krankenhäuser und Gefängnissen im 18. und 19. Jahrhundert* (Stuttgart: Franz Steiner, 2005).

hopeless by “scientific” physicians.²⁰² Those sects that centered on diet tended to claim this as their unique and “gentle” contribution to the therapeutic arts, with many heterodox healers rejecting “soup for the sick” as a uniform prescription insensitive to the unique needs of individual patients. Simultaneously, the proliferation of laboratory results about the composition of foodstuffs and their effects on healthy and ailing bodies imparted increasingly sophisticated understandings of pathophysiological processes and encouraged mainstream clinicians to prescribe diets tailored to their patients’ diagnoses and preferences. By the time Heyl started writing in the 1880s, German hospitalists increasingly supplemented watery Krankensuppen with “special orders” of milk, bread, or eggs. After 1900, individualized diets were the norm for the growing clientele of paying hospital customers.²⁰³ Unsurprisingly, the convergence of regular and irregular medical sects in dietetics and other areas influenced the domestic care of the sick, where older disease models and recommendations, the latest in medical science, and newer, “alternative” therapies intermingled.

What follows is necessarily a discussion of ideal theories and practices rather than what was demonstrably prescribed, cooked, or eaten in sick rooms and clinics in late-nineteenth- and early twentieth-century Germany. But it ably demonstrates the kinds of dialogues that occurred where the domains of food and bodies intersected, as ongoing debates revisited the place of meat

²⁰² Avi Sharma, “Bodies of Concern: Alternative Medicine and the Secret History of German Modernity, 1799-1921” (diss., Univ. Chicago, 2009); *ibid.*, *We Lived for the Body: Natural Medicine and Public Health in Imperial Germany* (DeKalb, IL: NIU Press, forthcoming); Uwe Heyll, *Wasser, Fasten, Luft und Licht: die Geschichte der Naturheilkunde in Deutschland* (Frankfurt am Main: Campus Verlag, 2006); Cornelia Regin, *Selbsthilfe und Gesundheitspolitik: die Naturheilmovement im Kaiserreich, 1889 bis 1914* (Stuttgart: Franz Steiner, 1995); Karl E. Rothschild, *Naturheilmovement—Reformmovement—Alternativmovement* (Stuttgart: Hippokrates Verlag, 1983); Edith Heischkel, “Das Wasser als Arzneimittel in der romantischen Medizin,” *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften* 36, no. 3 (1952):119-149.

²⁰³ Thoms, *Anstaltskost im Rationalisierungsprozess*; *ibid.*, “Die Kur aus der Küche. Krankenernährung im 19. Jahrhundert,” *WerkstattGeschichte* 31 (2002): 26-49; *ibid.*, “Between Medical Ideals and Financial Restraints. Standards of German Hospital Food in the 19th and Early 20th Centuries,” in *Order and Disorder: The Health Implications of Eating and Drinking in the Nineteenth and Twentieth Centuries*, ed. Alexander Fenton, 281-295 (East Linton: Tuckwell Press, 2000); and *ibid.*, “Krankenhauskost zwischen ärztlicher Therapie und administrativer Sparpolitik,” in *Die Revolution am Esstisch. Neue Studien zur Nahrungskultur im 19./20. Jahrhundert*, ed. Hans-Jürgen Teuteberg, 219-231 (Stuttgart: Franz Steiner, 2004).

and vegetables in therapeutic diets and deliberated whether a patient's hunger (or lack thereof) was a reliable signal of her body's nutritional needs and digestive capabilities. The next three sections of this chapter consider the variety of criteria in popular, medico-scientific, and naturopathic dietetics and how these changed over four decades. The fourth section compares and contrasts the relative importance of external (expert) and internal (innate) sources of authority in the matter of food and drink. Animosity between mainstream and alternative nutritionists may have contributed to the time it took for qualitative nutrition to be accepted in the early twentieth century, but it had a positive effect on Germans' awareness about varying body concepts and dietary systems. This biological literacy contributed to the contexts in which the telescopic body metaphor developed during and after World War I.

Nutrition in the sick room, 1890-1930

Between 1890 and 1930, the sick were mostly cared for at home.²⁰⁴ Those who could afford it might seek treatment at a spa or sanatorium, and admission to a hospital became more common for the middle classes over this period, but house calls were still the norm.²⁰⁵ (Male) physicians moved in and out of sick rooms, while (female) nurses, friends, and relatives provided constant care with the aid of cookery and guidebooks written by authors who ranged from doctors to institutional matrons to professional domestic scientists. The minority of recipes in both general and specialty cookbooks was directed at individuals with known conditions such as typhoid fever, kidney stones, or gastrointestinal catarrh (inflammation). Rather, advice in such popular resources was labeled generically for "sick persons" (*Kranken*), as if regardless of their ailment they all shared the characteristics of poor digestion and/or weak bodies. The four most common criteria for determining whether a food or drink was good for "the sick" were its

²⁰⁴ Karen Nolte, "Dying at Home: Nursing of the Critically and Terminally Ill in Private Care in Germany Around 1900," *Nursing Inquiry* 16, no. 2 (2009): 1144-154.

²⁰⁵ Thoms, *Anstaltskost im Rationalisierungsprozess*, 96-105.

digestibility, its strengthening or restorative capability, whether it would pollute the patient's body, and whether it could put his altered physiological state back into balance. Mainstream advice-givers favored the first two characteristics, while alternative healers relied on the last two.

The thread of digestibility (*Verdaulichkeit*) runs throughout discussions of both normal and clinical dietetics in Germany in the late nineteenth and early twentieth centuries.²⁰⁶ A food's digestibility relied on a combination of common experience and laboratory observations. "Easily digestible" (*leichtverdauliche*) foods left the stomach relatively quickly, in an hour or two, while "hard-to-digest" (*schwerverdauliche*) ones remained for three or four hours.²⁰⁷ The indigestibility of certain parts of meat and vegetable foods (like gristle, cellulose, and bran) was a particular concern in dietetics, for energy that had to be directed toward breaking down food could not be used for healing the body; in addition, what could not be broken down and absorbed did not help the individual and might even harm her.

Looking at a common household resource like Henriette Davidis and Luise Holle's *Practical Cookbook*, we find on the one hand foods forbidden to the sick, because they were considered too difficult to digest. Off-limits were whole red meat, raw vegetables, warm puddings, pancakes (*Eierkuchengerichte*, because cooked in fat), and animal fats like lard, butter excepted. (Butter and milk were premier sick foods.²⁰⁸) Holle even went so far as to warn, "All

²⁰⁶ E.g. Johann Friedrich Wilhelm Schilling, *Die Verdaulichkeit der Nahrungs- und Genußmittel auf Grund mikroskopischer Untersuchungen der Faeces* (Leipzig: Hartwig und Sohn, 1901).

²⁰⁷ Tables and charts based on Franz Penzoldt's (1848-1927) results at the University of Erlangen appear regularly across this period: e.g. Otto Dornblüth, *Diätetisches Kochbuch*, 2. Aufl. (Würzburg: A. Stubers & Curt Kabitzsch, 1905), 278-282; Ragnar Berg and Martin Vogel, *Die Grundlagen einer richtigen Ernährung*, 7. Aufl. (Dresden: Deutscher Verlag für Volkswohlfahrt, 1930), 47. For popular discussions of digestibility, see e.g. "Die Verdaulichkeit der Gemüse," *Dresdner Hausfrau* 11, no. 39 (4 July 1913): 2; "Ueber die Verdaulichkeit," *DH* 28, no. 29 (17 Apr. 1930): X; Henriette Davidis and Luise Holle, "Die Verdaulichkeit unserer Nahrung," *Praktisches Kochbuch für die einfache und feinere Küche*, 60. Aufl. (Bielefeld und Leipzig: Verlag von Velhagen & Klasing, 1935): 672-673.

²⁰⁸ They could be prescribed for almost any complaint, including tuberculosis, chronic stomach catarrh, acute nephritis, neurasthenia, and gout. Milk was the main component of nutritional enemas for patients who could not eat. Josef Mering, ed., *Lehrbuch der inneren Medizin*, 1. Aufl. (Jena: Gustav Fischer, 1901): 268, 386, 579, 874, 1007, 1054.

raw lettuces are toxic to the sick.”²⁰⁹ She would have balked at serving the “Garden Lettuce Salad” described at the start of this chapter to any person with an acute condition. Because of their texture, acidity, or pungency, lettuce, vinegar, mustard, and most spices were considered digestive and renal (kidney) irritants.²¹⁰

On the other hand we find in the *Practical Cookbook* foods considered beneficial for the sick. These included compotes made from dried fruit like prunes. “Steamed fruit without sugar ... gives an inexpensive while at the same time enjoyable and refreshing compote,” wrote Holle, “especially with flour dishes (*Mehlspeisen*), which, because neither vinegar nor spices are used in them, are eminently recommended for the sick.”²¹¹ Apparently blandness was good not only for those with kidney ailments but for all “the sick.” Some foods just needed to be modified before they could be served to a patient. As in the “Scraped Beef” recipe above, meat could be ground into beef steak or boiled into broth. Light soufflés were also allowed, while blanched or scalded onions reduced “everything unpleasant” about eating them (namely gas or bloating). Ice cream (cold) and coffee (hot, stimulating) were permissible only with a doctor’s prescription.²¹²

By virtue of the energy they provided in an easy-to-digest form, some drinks were good for the sick in general. Like Hippocrates’ tisane, many were made of water and carbohydrate sources such as bread, arrowroot, or barley. For instance, a common home remedy was a thin gruel made of oats (*Hafererschleim*), not to be confused with the thicker porridge called *Haferflockenbrei* (oatmeal, in American English):

²⁰⁹ “Alle Salate sind für Kranke Gift.” Henriette Davidis and Luise Holle, *Praktisches Kochbuch für die einfache und feinere Küche*, 39. Aufl. (Bielefeld & Leipzig: Velhagen & Klasing, 1901), 482.

²¹⁰ In German, the adjective *scharf* means both “spicy” and “sharp.”

²¹¹ “Dünstfrüchte ohne Zucker ... geben ein wohlfeiles, zugleich aber ein angenehmes und erfrischendes Kompott, besonders zu Mehlspeisen, welches, da weder Essig noch Gewürz dazu gebraucht wird, vorzüglich für Kranke zu empfehlen ist.” Davidis and Holle, *Praktisches Kochbuch* (1901), 604; see also 464. *Mehlspeisen* were any number of dishes that included flour (*Mehl*): pastries, cakes, heavy puddings, dumplings, pasta, and even pancakes. They were particularly popular in southern Germany and Austria.

²¹² Davidis and Holle, *Praktisches Kochbuch* (1901), butter 9, onions 29, soups 53, warm puddings 358, soufflés 373, *Eierkuchengerichte* 393, ice cream 430, “lite” baked goods 593, coffee 695.

Oat Gruel for the Sick

Stir 20 g oats with water and cook it for 20 minutes in ½ L of boiling water in which one has placed 1 piece of ginger. The gruel is put through a sieve, 2 egg yolks beaten with 60 g sugar and ½ L porter until fluffy, and mixed with the gruel.²¹³

This recipe is much richer than the Haferschleim Germans cook as sick food today out of oats, a pinch of salt, and water. That simple mixture is meant to taste good when eaten but not to irritate or burden the digestive tract—exactly the principles Holle claimed to be following. Heyl and Holle’s oat gruel recipe sounds more like current oatmeal recipes, which include milk, sugar, butter, raisins, cocoa powder, linseed oil, grated or chopped apple, almonds, and/or honey—but never beer!²¹⁴ Porter or stout, like low-alcohol malt beers, was once considered a strengthening health food; and in fact, none of these authors forbid alcohol out-right for the sick.²¹⁵

More than for solid foods or dishes, Holle often identified certain drinks with specific ailments. For fever she suggested hot lemonade of boiling water, lemon juice, and sugar, a drink still popular during cold and flu season (*heiße Zitrone*).²¹⁶ For “severe stomach ailments” Holle recommended “egg-white water” (*Eiweißwasser*) made from a broken-up egg white mixed with a small glass of water and allowed to stand for an hour; the thinner supernatant could be mixed with four (!) teaspoons of sugar and apple or lemon juice, white wine, or cognac for “a pleasant taste.” Boiled and strained rice with cinnamon and maybe sugar could sustain a person through diarrhea, while vinegar seasoned with violets was “a comforting drink for patients, namely in

²¹³ “Haferschleim für Kranke. 20 g rührt man mit Wasser an, kocht es in ½ l kochendem Wasser, in das man 1 Stückchen Ingwer gethan [hat], etwa 20 Minuten. Der Haferschleim wird durch ein Sieb gethan, 2 Eigelb mit 60 g Zucker und ½ l Porter schaumig geschlagen und zu dem Haferschleim gerührt.” Davidis and Holle, *Praktisches Kochbuch* (1901), 693. Holle seems to have borrowed this recipe, unattributed, from Hedwig Heyl; Holle merely doubled the measurements. Heyl, “Haferschleim mit Porter,” *Krankenkost*, 832.

²¹⁴ “Rezept für Haferschleim?” Chefkoch.de, posted 24 Feb. 2004 by süßmaul, accessed 2 March 2012, <http://www.chefkoch.de/forum/2,1,65998/Rezept-fuer-Haferschleim.html>.

²¹⁵ E.g. “Köstritzer Schwarzbier,” *Dresdner Hausfrau* 12, no. 27 (3 April 1914): 29. According to this advertisement, a bottle per day was good for new mothers, anemics, and others who needed to regain their strength. Estes, “Food as Medicine,” 1541.

²¹⁶ In this paragraph, Davidis and Holle, *Praktisches Kochbuch* (1901), 692-694.

nervous conditions and headache,” when drunk with water and a little sugar.²¹⁷

If such recipes drew on scientific reasoning, the sparse format and economic wording typical of domestic cookbooks hides this, and one assumes they reflect the author’s empiricism or the collected experience of generations of housewives. Why else would diluted raspberry vinegar be “as refreshing as [it is] digestible” for patients with fevers but not with chest ailments?²¹⁸ It is of course impossible to tell if readers prepared the recipes as intended or at all,²¹⁹ but it should be safe to assume that a reference book like Davidis-Holle’s was neither intended nor used as a replacement for professional medical assistance. For instance, not until 1935 does Holle mention diabetes mellitus, for which she recommends cold vegetable broth.²²⁰ That was an unobjectionable dish according to contemporary scientific standards, but it was hardly the basis for a complete diet. This discrepancy reflects division of authority: a medical doctor presumably provided dietary guidelines after he diagnosed a patient with “the sugar disease,” but anything a housewife or mother could diagnose—like a mild fever—she could also treat.

Because a good appetite was considered necessary for the complete digestion of food, authors on dietetics frequently bemoaned the fact that “the sick” were so seldom hungry. Hedwig Heyl instructed the readers of her first book on dietetics to stimulate their patients’ weak digestive capabilities by offering small portions on small dishes “because the daintiness increases the patient’s appetite.”²²¹ Likewise, one should not dampen what little appetite the patient did

²¹⁷ Davidis and Holle: “ein beruhigendes Getränk für Kranke, namentlich bei Nervenleiden und Kopfschmerz.” *Praktisches Kochbuch* (1901), 694.

²¹⁸ “Himbeer-, Johannisbeer- oder Kirschensaft, besonders auch Himbeeressig mit Wasser vermischt, sind namentlich in Fieberkrankheiten dem Kranken ebenso erfrischend als zuträglich; für Brustleidende aber paßt letztere nicht.” Davidis and Holle, *Praktisches Kochbuch* (1901), 695.

²¹⁹ Ulrike Thoms, “Kochbücher und Haushaltslehren als ernährungshistorische Quellen. Möglichkeiten und Grenzen eines methodischen Zugriffs,” in *Neue Wege zur Ernährungs-Geschichte: Kochbücher, Haushaltsrechnungen, Konsumvereinsberichte und Autobiographien in der Diskussion*, ed. Dirk Reinhardt, Uwe Spiekermann, and Ulrike Thoms, 9-50 (New York: Peter Lang, 1993), 37.

²²⁰ Davidis and Holle, *Praktisches Kochbuch* (1935), 605.

²²¹ Heyl: “den die Zierlichkeit des Auftragens erhöht die Eßlust des Patienten,” *Krankenkost*, 5.

have by preparing food in front of him, serving multiple courses at once, or leaving partially eaten food in the sick room, as “the patient fills himself up by sight before he can eat any of what is left sitting there.”²²²

The debate over meat in therapeutic diets

On account of its reputation as an easily digestible, appetite-stimulating, and strengthening tonic, the most common home remedy was meat broth.²²³ Recipes for it were easy to find, as it was usually the first entry in the first chapter (soup) of most cookbooks. Here is a representative example from the section entitled “Bouillon und Peptone” in Heyl’s 1889 dietetic cookbook:

Weak Veal Bouillon

| | |
|------------------------------------|----------------|
| Ingredients and costs for 1 person | |
| 125 g veal (tips) | <i>M</i> 0.15 |
| 1 carrot | “ 0.01 |
| 5 g salt | “ 0.00¼ |
| ½ L water | <i>M</i> 0.16¼ |

Preparation: The veal is washed, beaten very thin, cubed or ground, and gently cooked, covered, 2¼ hours with the cold water, the cleaned carrot, and salt. [Then it is] put through a sieve and used for the desired soup.

Preparation time: 2 ¾ hours.²²⁴

Reductions of meat (beef, chicken, pigeon) with or without vegetables served as the basis for many soups and sauces, in addition to being considered an ideal sick food. Notice that this recipe yields a bouillon strained of the solids that would have required more effort from the patient’s body to digest. By the end of the nineteenth century, the busy housewife could supplement or

²²² Heyl: “das Auge des Leidenden sieht sich an dem fortdauernd Dastehenden satt, ehe er davon genossen hat.” *Krankenkost*, 6.

²²³ Hans-Jürgen Teuteberg, et al., *Die Rolle des Fleischextrakts für die Ernährungswissenschaften und den Aufstieg der Suppenindustrie. Kleine Geschichte der Fleischbrühe* (Stuttgart: Franz Steiner, 1990), 5-7. Long considered an old wives’ tale, this homemade recipe for health received a seal of scientific approval about a decade ago, when a pulmonologist conducted laboratory experiments with the white blood cells responsible for, among other things, the inflammatory response to an infection. B. O. Rennard, et al., “Chicken soup inhibits neutrophil chemotaxis in vitro,” *Chest* 118, no. 4 (Oct. 2000): 1150-1157.

²²⁴ “Schwache Kalbfleischbouillon. Zuthaten und Kosten für 1 Person. ... Zubereitung: Das Kalbfleisch wird gewaschen, sehr klein geschlagen und gewiegt oder gehackten und mit dem kalten Wasser, der geputzten Karotte und Salz in einem kleinen Topf, zugedeckt, langsam 2 ¼ Stunde gekocht, durchgeseibt und zu beliebiger Suppe verwendet. Zeitdauer der Bereitung: 2 ¾ Stunden.” Heyl, *Krankenkost*, 7.

substitute homemade broth with a variety of store-bought concoctions.²²⁵

There were several variations on this basic recipe. Other versions required complicated equipment, such as a hermetically sealed canister for preparing beef tea by double-boiling 1/2 kg of lean beef for four hours.²²⁶ The meat left over from this operation could be re-purposed for other dishes, but not for the sick person, whose body presumably could not digest that part.²²⁷ Some recipes required ingredients one had to buy from a pharmacist, such as distilled water, hydrochloric acid (HCl), sodium bicarbonate (to counteract the acid), and “German pepsin,” probably a preparation made from cattle stomach or pancreas that was supposed to contain digestive enzymes.²²⁸ To make these pre-digested meat solutions more palatable to the patient, Heyl recommended the addition of meat extract, lemon juice, sugar, cognac, wine, or rum.

“In this way the protein bodies of the meat are changed into peptone, in which state they most easily go through [the process of] digestion,” explained Heyl. “The stomach finds work has been done that it would otherwise have to do.”²²⁹ In fact, such procedures supposedly replicated the action of the stomach so well that Heyl and her physician colleagues recommended using a “Meat Solution” in cases requiring intestinal nutrition, when a patient’s upper digestive system functioned so poorly that he or she needed to be fed a liquid diet through a tube inserted into the stomach or by a rectal enema.²³⁰ Not all sick persons needed such drastic measures, but these

²²⁵ Heyl, *Krankenkost*, 19; *ibid.*, *Diätküche*, 42.

²²⁶ This sounds like Denis Papin’s (1647-1714) pressure-cooker method: Teuteberg, *Die Rolle des Fleischextrakts*, 3; Elmer Verner McCollum, *A History of Nutrition: The Sequence of Ideas in Nutrition Investigations* (Boston: Houghton Mifflin Company & Riverside Press, 1957), 42.

²²⁷ Heyl, *Krankenkost*, 12-13.

²²⁸ By the 1890s, Ivan Pavlov’s laboratory in Moscow was selling bottled canine gastric secretions as a digestive aid. Daniel P. Todes, *Pavlov’s Physiology Factory: Experiment, Interpretation, Laboratory Enterprise* (Baltimore: Johns Hopkins University Press, 2002), 259-288.

²²⁹ “Auf diese Weise werden die Eiweißkörper des Fleisches in Pepton umgewandelt, in welchem Zustande sie am leichtesten in die Verdauung übergehen. Der Magen findet eine ihm sonst zufallende Arbeit gethan.” Heyl, *Krankenkost*, 20. Pre-digestion was also a principle of John Harvey Kellogg’s Battle Creek Sanitarium. Nicholas Bauch, “The Extensible Digestive System: Biotechnology at the Battle Creek Sanitarium, 1890-1900,” *Cultural Geographies* 18, no. 2 (April 2011): 209-229.

²³⁰ Heyl, *Krankenkost*, 19-22; Wilhelm von Leube, “Über die Künstliche Ernährung,” in *Handbuch der Ernährungs-*

recipes and Heyl's remarks reveal that for many Germans, to be sick was to be weak—especially in the gastrointestinal tract—and one remedy was strengthening meat broths whose components were easy to break down and assimilate.

The ubiquity of meat broth for the sick was thanks in part to Justus von Liebig lending his name and prestige to the *Extractum carnis* that Max von Pettenkofer and his uncle, pharmacist Franz Xaver Pettenkofer, had developed from Liebig's nutritional principles and sold in Munich since 1848.²³¹ In 1862, Georg Christian Giebert (†1874) began applying Liebig's protein science to the global agribusiness problem of turning the vast cattle herds of South America into a form cheaply transportable across the Atlantic Ocean. Liebig's Extract of Meat Company Ltd. soon began marketing Liebig's Meat Extract (*Liebig's Fleischextrakt*) as an easily digestible concentrated meat substitute. Unfortunately, chemical food analysis quickly showed the liquid to be no more than a simple if tasty bouillon—despite the approximately 32 kg (70 lb) of fresh beef used to make one kilogram of the stuff (2.2 lb)!

Fortunately for the manufacturers, the standards for nutrition in the kitchen and the sick room were lower than the burden of proof the clinic demanded. When Carl von Voit repudiated the mixture's nutritional and caloric value and the company realized it could not win over the medical establishment, it sought an endorsement from Pettenkofer and turned its attention to housewives.²³² Liebig himself approached Germany's most famous cookbook author, Henriette Davidis (1801-1876), herself a shrewd businesswoman.²³³ In advertisements and cookbooks,

therapie und Diätetik, ed. Ernst von Leyden, 1. Aufl., vol. 1, no. 2, 490-519 (Leipzig: Georg Thieme, 1898); Dornblüth, *Diätetisches Kochbuch* (1905), 337-339. Presumably a nurse was responsible for this procedure.

²³¹ Teuteberg, *Die Rolle des Fleischextrakts*, 5-13.

²³² Mark R. Finlay, "Quackery and Cookery: Justus von Liebig's Extract of Meat and the Theory of Nutrition in the Victorian Age," *BHM* 66, no. 3 (Fall 1992): 404-418; *ibid.*, "Early Marketing of the Theory of Nutrition: The Science and Culture of Liebig's Extract of Meat," in *The Science and Culture of Nutrition, 1840-1940*, ed. Kamminga, Harmke, and Andrew Cunningham, 48-74 (Atlanta: Rodopi, 1995); Teuteberg, *Die Rolle des Fleischextrakts*, 19-20.

²³³ Willy Timm, "Henriette Davidis (1801-1876)," *Westfälische Lebensbilder* 12 (1979): 88-103.

they promoted the meat extract and later incarnations (such as Oxo Bouillon) as condiments whose aroma and taste not only made dishes more enjoyable but increased their digestibility by stimulating the production and secretion of digestive juices.²³⁴ Cookbook authors acknowledged housewives could increase the nutritional value of flavorful broths with protein-rich eggs and fatty cream if they wanted to, but sometimes a delicious if not particularly nutritious broth sufficed.²³⁵ The scientific message about what was and was not nutritious in the sense of fuel (carbohydrates and fats) and physical substrate (proteins) had been learned, but the product was still used anyway because it was a tasty time saver. Ailing Germans could expect to sip *Kraftbouillon*, *Fleischsolution*, or pigeon and vegetable soup well into the twentieth century.²³⁶

While the mainstream focused on the digestibility and nutritive power of food and drink for the sick, those who relied on alternative healers and texts often wanted to bring a sick body back into balance. This generally involved cleansing the body of toxic metabolites that acidified bodily fluids. For instance, naturopathic physician Heinrich Lahmann challenged the conventional wisdom of feeding fever patients “strengthening” foods, namely beef broth, on account of his belief in their bodies’ inability to safely utilize the biochemical components of meat. He argued that feverish patients suffered from a disadvantageous admixture of the blood, a *Blutentmischung* or *Dysämie*, from the Greek *dys* “bad” + *emia* “blood.”²³⁷ Their bodies needed

²³⁴ Liebig Company’s *Fleisch-Extract in der bürgerlichen Küche: eine Sammlung erprobter einfacher Recepte von der Herausgeberin des Kochbuches von Henriette Davidis mit einem Anhang von Recepten für Krankenkost unter Verwendung des Fleisch-Peptions der Compagnie Liebig* (n.p.: [Selbstverlag], 1875), Projekt: Bibliotheca Gastronomica, <http://digital.slub-dresden.de/id312383088>; Teuteberg, *Die Rolle des Fleischextrakts*, 23-37. For the similar case of Maggi’s spices stimulating digestion, see Curt Schröder, “Über den ernährungstherapeutischen Wert von Maggis Würze,” *DmW* 38:2, no. 32 (8 Aug. 1912): 1503-1505.

²³⁵ E.g. Davidis and Holle, *Praktische Kochbuch* (1935), 602. Interestingly, the advertising pages in the 1875 pamphlet tout its nutritional value, while the recipes praise its digestibility and recommend other ingredients to increase the nutritiousness.

²³⁶ Heyl, *Diätküche*, 39-49.

²³⁷ Heinrich Lahmann, “Kost für Fiebernde,” in *Die wichtigsten Kapitel der natürlichen (physikalisch-diätetischen) Heilweise*, 2. Aufl. der Physiatischen Blätter” (Stuttgart: A. Zimmer’s Verlag [Ernst Mohrmann], 1894), 81-82. In addition, drinking too much with meals supposedly diluted bodily fluids and their ability to carry out necessary biochemical reactions, what he called *Hydrämie* (watery blood).

to remove the abnormal metabolites by urination, expiration, or perspiration, all of which were naturally and beneficially increased during a fever. But when an animal was slaughtered for human consumption, death cut short its ability to carry out these very same waste-removal processes. The urea, creatinine, xanthine, and other physiological by-products remaining in the animal's flesh were "notorious heart stimulants" (*notorische Herzerreger*), as anyone could tell who had measured his own pulse after consuming a meat-rich meal, claimed Lahmann.²³⁸ It was therefore common sense that when the heart's work increased—as during a fever—so did its production of metabolic byproducts. Consuming meat broth only amplified the load of potential toxins that a patient's already taxed system had to eliminate.

According to Lahmann, the bodies of the feverish instinctively crave fruit juices, dried fruit (*Backobst*), and simple gruels that do not generate toxic and/or acidic metabolites.²³⁹ In his incredibly popular "Bilz Book," naturopath Friedrich Eduard Bilz agreed: "The 'best medicine' for fever patients is fruit juices, because they contain many bases and alkaline elements and thereby increase the alkalinity of the blood, i.e. its ability to bind acids."²⁴⁰ He recommended an easily digestible and largely liquid diet of dairy products like yogurt, kefir, or warm milk; compotes and non-alcoholic fruit or vegetable juices from apples, bananas, plums, berries, cucumbers, or carrots; and porridges made with barley, oats, or rice.

If Lahmann and Bilz's recommended fever diet resembles a meatless version of the

²³⁸ Lahmann, "Kost für Fiebernde," 81. Ann Fischer-Dückelman later referred to meat as "parts of an animal corpse [*Leichenteile*] that contain as-yet unexcreted metabolic products (carbon dioxide, urea, and others)." She disagreed with the physicians who attributed the enjoyable tastes of meat and vegetables to these substances and credited nutrient salts (*Nahrsätze*) instead. *Die Frau als Hausärztin*, 2. Jubiläums-Pracht-Ausgabe (Stuttgart: Süddeutsches Verlags-Institut, [1907?]), 57, 85.

²³⁹ Lahmann: "alkali-rich fruit juices are the best medicine for fever patients," *Die diätetische Blutentmischung (Dysämie) als Grundursache aller Krankheiten*, 9. Aufl. (Leipzig: Otto Spamer, 1899), 121; *ibid.*, *Die wichtigsten Kapitel* (1894), 82. I cannot tell whether Lahmann borrowed from Bilz or vice versa.

²⁴⁰ "Die 'beste Medizin' für Fiebernde sind Obstsäfte, weil sie viel Alkalien und alkalische Erden enthalten und dadurch die Alkaleszenz des Blutes, d. h. seine säurebindende Kraft, erhöhen." Friedrich Eduard Bilz, "Fieberdiät," in *Das neue Naturheilverfahren. Lehr- und Nachschlagbuch der naturgemäßen Heilweise und Gesundheitspflege*, 93. Aufl. (Leipzig: F. E. Bilz & Frankenstein & Wagner in Leipzig, [c. 1900]), 242-243, here 242. Between 1888 and 1956, this home health manual sold 3.5 million copies in 13 languages.

mainstream fever diet, that is because the presence of animal protein (especially meat) generally divided “regular” from “irregular” nutritional advice. Among conventional nutritionists, meat was a defining principle of a healthy diet—second only to calories (before World War I) or vitamins (after World War I)—as well as a dividing line between normal and therapeutic diets. Many mainstream physicians continued to understand sick bodies as ones with delicate gastrointestinal systems that could not digest meat (or fat, or vegetable fibers), at least secondarily.²⁴¹ With such debates about physiology accessible even in their cookbooks and home health guides, Germans could hardly have missed the variable applications of nutrition in the kitchen, the sick room, and the clinic, whatever their personal preferences or economic opportunities.

Nutrition in the clinic, 1890-1930

“Regular” (allopathic) and “irregular” (alternative) are imprecise but convenient labels for schools of thought and practice with separate and distinct centers but thick and overlapping margins (and in the case of alternative medicines multiple centers). From about 1870 to 1943, non-traditional German healers enjoyed the freedom to study and practice medicine (*Kurierfreiheit*) whether or not they held a medical degree or a state license.²⁴² However, many alternative practitioners (like Lahmann, Siegfried Möller, and Anna Fischer-Dückelmann)

²⁴¹ See e.g. the in-depth discussion from the production of saliva to the excretion of nitrogen about why fever patients have reduced appetites in Ernst von Leyden and Georg Klemperer, “Ernährungstherapie bei Fieberkrankheiten,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden and Georg Klemperer, 2. Aufl., vol. 2, 322-363 (Leipzig: Georg Thieme, 1904), 326-339. “Under no circumstances is one justified in looking at protein as unsuitable for fever patients,” 337.

²⁴² “Gesetz, betreffend den Betrieb der stehenden Gewerbe,” *Bundesgesetzblatt des Norddeutschen Bundes* no. 23 (1868): 406-407; “Gesetz über die berufsmäßige Ausübung der Heilkunde ohne Bestellung (Heilpraktikergesetz). Vom 17. Februar 1939,” *RGBl*, Teil I, Nr. 30 (20 Feb. 1939): 251-252. The Free Trade Law (*Gewerbefreiheitsgesetz*) had guaranteed a legal right to practice medicine in 1869 (Prussia)/1873 (German Empire) as part of a movement for liberal free markets and professional self-regulation. When some National Socialists’ holistic proclivities ran up against the NS state’s interest in a medicine suitable for fighting World War II, the federal government finally heeded physicians’ calls to protect the public from quackery and outlawed alternative medical education and practice without a special license. West German healers won the right to education again in 1952, but they almost literally died out in East Germany, under that regime’s centralized training system.

obtained medical degrees and licenses in order to enjoy the legal protections.²⁴³ Of all the heterodox sects, naturopathy was the most popular, with membership in its organizations peaking just before World War I. It offered inexpensive remedies to the poor, self-help to the middle-class, and exclusive spas to the rich. Some orthodox physicians felt threatened by the dissenters' encroachment in the medical marketplace and by their attempts to cede control over patients' bodies to the public by educating them about anatomy, physiology, diet, and hygiene. However, before World War I their anti-quackery campaigns convinced only government officials, who restricted non-physicians' ability to practice for the duration of the war.²⁴⁴ Afterwards, their feud took on new and subtle dimensions.

Historian Sabina Merta explains that “the conflict between academic medicine and naturopathy began when the laity fought for access to hydrotherapy [in the mid-1800s], continued in vegetarians' fight for a plant-based diet [from the 1860s], and ended [in the 1920s and '30s] in diet reformers' fight for biological weight-loss methods.”²⁴⁵ By the interwar period, scientific medicine had absorbed much of the spectrum of physical therapies, while shutting out many of its practitioners from academic institutions.²⁴⁶ This borrowing both precipitated and was

²⁴³ Carsten Timmermann, “Rationalizing ‘Folk Medicine’ in Interwar Germany: Faith, Business, and Science at ‘Dr. Madaus & Co.’,” *Social History of Medicine* 14, no. 3 (2001): 459-483, esp. 460-461.

²⁴⁴ Cornelia Regin, “Zwischen Angriff und Abwehr: Die Naturheilbewegung als medizinkritische Öffentlichkeit im Deutschen Kaiserreich,” in *Medizinkritische Bewegungen im Deutschen Reich (ca. 1870-ca. 1933)*, ed. Martin Dinges, 39-58 (Stuttgart: Franz Steiner, 1996); Avi Sharma, “The Anti-Politics of Health: Consensus and Conflict in the German Natural Healing Movement, 1890-1910,” *Circumscribere* 10 (2011): 66-78; *ibid.*, “Wilhelmine Nature: Natural Lifestyle and Practical Politics in the German Life-Reform Movement (1890-1914),” *Social History* 37, no. 1 (Feb. 2012): 36-54. By 1914 there were about 200,000 members in c. 900 naturopathy clubs around the empire.

²⁴⁵ “Der ‘Schulmedizin-/Naturheilkundekonflikt’ nahm seinen Anfang im Kampf der Laien für die Hydrotherapie, setzte sich im Kampf der Vegetarier für die Pflanzenkost fort und endete im Kampf der Diätreformer für die biologische Entfettungsmethoden.” Sabina Merta, *Wege und Irrwege zum modernen Schlankheitskult. Diätkost und Körperkultur als Suche nach neuen Lebensstilsformen 1880-1930* (Stuttgart: Franz Steiner, 2003), 72.

²⁴⁶ Avi Sharma, “Medicine from the Margins? *Naturheilkunde* from Medical Heterodoxy to the University of Berlin, 1889–1920,” *Social History of Medicine* 24, no. 2 (2011): 334-351; Marina Lienert, “‘Naturheilkunde ist keine Wissenschaft!’ Naturheilvereine, Ortskrankenkassen und Parteien in den Auseinandersetzungen und die Errichtung eines Lehrstuhls für Naturheilkunde an der Universität Leipzig (1894-1924),” in *Medizinkritische Bewegungen im Deutschen Reich (ca. 1870-ca. 1933)*, ed. Martin Dinges, 59-78 (Stuttgart: Franz Steiner, 1996). Chairs for nature-pathic medicine were endowed at Berlin (1920) and Jena (1924) but not Leipzig, despite Saxony's reputation as a cradle for non-traditional medical practice.

a reaction to a crisis of legitimacy that mainstream physicians faced during the Weimar Republic (1919-1932).²⁴⁷ Historian Michael Hau argues that many allopaths consciously developed a humanistic image, albeit one colored with generous amounts of paternalism, so they could both subjectively relate to their patients' experiences of illness and objectively treat their diseases. Meanwhile, naturopaths adopted some laboratory science and technologies like urinalysis, thereby narrowing the perceived gap between what the public sought from its healers (empathy) and what clinicians offered in terms of bedside manner and efficacy (diagnosis, treatment).²⁴⁸

My research shows that mainstream physicians had added diet to their pharmaceutical and surgical therapies at least thirty years before the period Hau covers. As early as the 1890s, alternative practitioners complained that orthodox clinicians employed dietetics and hydro-therapy while simultaneously criticizing their use by non-traditional healers. A Dr. Kantorowicz in Hannover grumbled that when allopaths wanted to find fault with naturopaths like him they would say, "Everything that you [naturopaths] do has been known to academic medicine for a long time, which has always employed" therapies such as diet, bathing, and calisthenics.²⁴⁹ Kantorowicz was sure a survey of orthodox textbooks and clinics from the second half of the nineteenth century would prove the converse: regular physicians had only recently adopted these methods from heterodox practitioners. Writing from the spa town of Friedrichroda in Thuringia, Dr. Max Böhm agreed: "We naturopaths certainly do not take offense that the orthodox medicine you [allopaths] characterize as eschewing [one-sided] principles has taken over most of our superb therapies, but the lack of principle cannot go so far as to deliver a blow to the face of

²⁴⁷ Carsten Timmermann, "Wer darf heilen und wer nicht? 'Kurfuscherei' und die Krise der Medizin in der Weimarer Republik," in *Lügen und Betrügen: Das Falsche in der Geschichte von der Antike bis zur Moderne*, ed. Oliver Hochadel and Ursula Kocher, 134-149 (Cologne: Böhlau, 2000).

²⁴⁸ Michael Hau, "The Humane Expert: The Crisis of Modern Medicine during the Weimar Republic," in *Experts in Science and Society*, ed. Elke Kurz-Milcke and Gerd Gigerenzer, 105-122 (New York: Kluwer, 2004).

²⁴⁹ "Alles, was Ihr da anwendet, ist der Schulmedizin längst bekannt, das hat sie immer angewendet." Kantorowicz, "Eine Redensart," *ApdT* 8, no. 9 (15 Sept. 1905): 265-266.

history, truth, and priority” by claiming that scientific medicine had discovered the efficacy of diet, massage, and light-, air-, or water therapy first!²⁵⁰

Far from mimicking a key tenet of their competitors’ practice, however, allopathic physicians in the late-nineteenth century saw themselves as reviving an ancient tradition of learned dietetics.²⁵¹ The diets they prescribed reflected their respective body concepts and understandings of disease pathology, with major differences in both what and whether to feed their patients. To begin, when an ailing person or her family sought a doctor’s care, the diagnosis was usually more serious than “fever” or “head cold.” Allopathic treatment for serious illnesses such as gout or ulcers generally consisted of both drugs and diet intended to treat symptoms and/or support the patient through an acute incident. Even if they knew the underlying pathophysiological mechanism, scientific physicians did not expect to cure their patients through food and drink. Rather, clinical dietetics should do no harm (*non nocere*), refresh (*erquicken*), and be beneficial (*nützlich sein*).²⁵² Under these criteria, cow’s milk was the quintessential sick food on account of its ability to deliver fat, sugar, and protein in a warm or cool easy-to-digest liquid form. For example, a 34-year-old patient named R. K. who spent a week in the hospital in November 1891 for pneumonia was served 1-2 L of milk mixed with meat powder every day, supplemented with 2 eggs and 100 g of sugar on the days before and after a fever crisis.²⁵³

Despite encouraging their colleagues to take each individual’s preferences into consideration, mainstream experts such as Ernst von Leyden (1832-1910) and Georg Klemperer (1865-

²⁵⁰ “Wir Naturärzte nehmen es der von Ihnen als prinzipienlos charakterisierten Schulmedizin durchaus nicht übel, dass sie den grössten Teil unserer herrlichen Therapie übernommen hat, aber soweit darf denn die Prinzipienlosigkeit doch nicht gehen, der Geschichte, der Wahrheit und der Priorität einen Faustschlag ins Gesicht zu geben, Herr Professor Fleisch!” Max Böhm, “Nochmals ‘eine Redensart,’” *ApdT* 8, no. 3 (15 March 1906): 65-66, here 66.

²⁵¹ Petersen, “Zur Geschichte der Ernährungstherapie.”

²⁵² Ernst von Leyden and Georg Klemperer, “Die Ernährungstherapie in Krankheiten,” in *Handbuch der Ernährungs-therapie und Diätetik*, ed. Ernst von Leyden and Georg Klemperer, 2. Aufl., vol. 1, 281-292 (Leipzig: Georg Thieme, 1903), 282-283.

²⁵³ Von Leyden and Klemperer, “Ernährungstherapie in akuten Fieberkrankheiten,” 336.

1946) were so accustomed to having control over their patients' diets that they expected to overrule their patients' aversion to drinking certain things, or to eating at all.²⁵⁴ In their textbook on clinical dietetics they give numerous suggestions on how to make milk more palatable to fever patients who do not like the taste or who complain it gives them gas or diarrhea.²⁵⁵ They also count the ability to cajole patients into eating when not hungry as a marker of an effective clinician. "The physician's task of inducing a patient to eat despite not having an appetite is frequently quite difficult," they write, "in that it commands all the skill, patience, and care of the medical arts."²⁵⁶ Whatever signs and symptoms the patient's body offered up about hunger, nausea, or pain, only an experienced physician could translate them into the correct combination of nutrients that the individual needed. Even a lack of hunger did not indicate that the patient should not eat (or be fed).

By contrast, some alternative practitioners promised to cure their patients by treating "the whole patient" through an individualized regimen of physical methods, including diet.²⁵⁷ They based this assurance on a unifying underlying disease mechanism rooted in the typical German diet. Consider the case of Herr S. from N., an obese man with vision problems and sugar in his urine who checked into Lahmann's Sanatorium in Weißer Hirsch outside Dresden in the 1890s for treatment of diabetes mellitus. Under the conviction that obesity, gout, and most cases of

²⁵⁴ Von Leyden and Klemperer, "Die Ernährungstherapie in Krankheiten," 283-285. Both men were leading clinicians and researchers at Berlin hospitals. Klemperer emigrated to the United States in 1935.

²⁵⁵ Von Leyden und Klemperer, "Die Ernährungstherapie in Krankheiten," 287-288 and "Ernährungstherapie in akuten Fieberkrankheiten," 342-345. Their suggestions resemble Davidis and Holle's: add coffee, cognac, oatmeal, or peppermint tea.

²⁵⁶ "Die Aufgabe des Arztes, den Patienten trotz fehlenden Appetites zum Essen zu bewegen und ihn zu ernähren, ist häufig eine recht schwierige, indem sie das ganze Geschick, Geduld und Umsicht der ärztlichen Kunst erheischt." Von Leyden, "Grundzüge der Ernährungstherapie," in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden and Georg Klemperer, 2. Aufl., vol. 1, 263-336 (Leipzig: Georg Thieme, 1903), 277, also 281-285. I credit both men with this sentiment, because Klemperer slightly edited this sentence from the first edition.

²⁵⁷ Wolfgang R. Krabbe, "Die Lebensreform. Individualisierte Heilserwartung im industriellen Zeitalter," *Journal für Geschichte* 2 (1980): 8-13. For an excellent example see the Franz Heinrich Sammlung, Institut für Geschichte der Medizin, Technische Universität Dresden. He spent a week at Lahmann's Sanatorium in April 1927, presumably also for obesity and diabetes. There is unfortunately no record of his satisfaction with the cure or its result.

diabetes were related by a reversible, acidic dysaemia, Lahmann put Herr S. on a diet designed to increase blood pH: little meat, lots of vegetables (especially lettuce and radishes), fresh and dried fruit, slow-cooked rice, and diabetic bread.²⁵⁸ Unlike some of his orthodox colleagues,²⁵⁹ Lahmann prescribed no drugs for diabetic patients.²⁶⁰ After almost four weeks of physical exercise, sweat- and sitzbaths, and salads like the one in the recipe above,²⁶¹ Herr S. had lost 16 pounds, his general health had improved, the glycosuria was nearly gone, and his eye weakness had resolved. A sediment had appeared in his urine, but Lahmann assured readers that this represented the detoxification of Herr S.'s body and was not due to his new diet—as critics were sure to suggest—since neither Lahmann himself nor his young sons experienced it while living on a similar low-protein diet all the time.²⁶² Because he connected diabetics' inability to metabolize glucose to their blood pH,²⁶³ Lahmann's dietary recommendations for "the sugar disease" were almost completely opposite those of allopathic practitioners, who generally prescribed a low-carbohydrate, high-protein, and high-fat diet for diabetes mellitus.²⁶⁴

²⁵⁸ Lahmann dismissed diabetes in children as a sign of degeneracy and so focused on diabetes in adults. In 1893, he had six diabetic patients ages 6-17 years old; he does not say that any of them lived, so we can assume their cases were terminal. Lahmann, *Diätetische Blutentmischung*, 70-81; Herr S.'s case is on p. 81.

²⁵⁹ Co-discoverer of the pancreatic seat of diabetes mellitus Josef von Mering (1849-1908) admitted that many medications had been promoted, even promised as cures for diabetes. "It would not be an exaggeration," he wrote, "if one said that there is hardly a drug in the doctor's armamentarium that hasn't supposedly been used with success." Authors in later versions of his textbook suggested opium, arsenic, and antipyrine for reducing glycosuria at a set level of carbohydrates, and sodium bicarbonate (by mouth or enema) was already being used to avert or ameliorate diabetic coma by the 1920s. "Diabetes mellitus, Zuckerharnruhr," in *Lehrbuch von inneren Medizin*, ed. Josef von Mering, 1. Aufl., 983-1001 (Jena: Gustav Fischer, 1901), 997; Friedrich Kraus, "Diabetes mellitus," in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Aufl., vol. 2, 177-195 (Jena: Gustav Fischer, 1922), 192.

²⁶⁰ Lahmann was following the lead of Dr. Adolph von Düring (1853-1909), who practiced in New York City. Georg Beyer, "Unsere Fortschritte in der Erkenntnis der Ursache und des Wesenes des Diabetes mellitus seit dem Bestehen des Sanatoriums," *Jubiläums-Mitteilungen aus Dr. Lahmanns Sanatorium Weißer Hirsch für ehemalige Kurgäste* 23 (Mai 1928): 32-35, Institut für Geschichte der Medizin, Technische Universität Dresden.

²⁶¹ The recipe is unique for calling for olive oil and lemon juice rather than the customary German dressing of oil and vinegar; Lahmann and Elise Starker (†1921), the matron of his sanatorium, believed that vinegar sometimes caused gastrointestinal discomfort, but lemon juice always promoted digestion. Starker, *Hygienisches Kochbuch* (1905), VIII.

²⁶² Lahmann had food and drug chemist Otto Schweissinger (*1856) analyze the unknown sediment at his laboratory in Dresden; it proved to consist of urea, uric acid, and potassium. *Diätetische Blutentmischung*, 76-79.

²⁶³ Lahmann, *Diätetische Blutentmischung*, 70-76.

²⁶⁴ Von Mering, "Diabetes mellitus," 992-994. A vocal minority worried about the risk of ketoacidosis from the

When an ailment was so severe that neither allopathic medicine nor naturopathy could cure it, a complete break from anything resembling a normal diet might be indicated. Dr. Siegfried Möller (1871-1943) subscribed to a protein-based disease theory like Lahmann's but used a more extreme therapy: he treated all of the patients at his sanatorium in Loschwitz outside Dresden with the "Schroth Cure."²⁶⁵ Whether they suffered from gout, asthma, anemia, chronic skin conditions, hysteria, neurasthenia, an enlarged heart, syphilis or mercury poisoning, Möller promised that sweating, urination, and diarrhea would cleanse them of the toxin(s) that had accumulated in their bodies and provoked their disease. Named for the Bohemian wagoner who invented it in 1820, the regimen combined moist heat from cloth compresses with a simple, low-protein diet of hard rolls and gruel ("dry" days) and small amounts of light wine (on alternating "wet" days).²⁶⁶ One former patient, a 30-year-old engineer, reflected on the years of unsuccessful treatments for his nervousness, insomnia, and lack of appetite. Despite "bromides by the liter," carbon-dioxide baths, a quiet stay by the sea, electric stimulation, valerian tea, and barbitol, "I felt that something undefinable was hiding inside of me and causing my whole condition."²⁶⁷ By chance he met Dr. Möller, "who revealed to me that my body was completely shot through with uric acid."²⁶⁸ Seven months of intermittently "taking the cure" between August 1907 and May 1908 rid him of this infiltrate, his appetite returned, and cleared up all his complaints.

A particular point of contention for Möller was the appropriate response of a clinician to

metabolism of protein and fat and advised their patients—especially children—to follow a low-carb, low-protein, low-fat starvation diet. Another notable exception was Carl von Noorden, famous for his "oatmeal cure." Scientific medicine did not gain proof that diabetes mellitus is linked to insulin and the pancreas until the 1920s. John Christopher Feudtner, *Bittersweet: Diabetes, Insulin, and the Transformation of Illness* (Chapel Hill: University of North Carolina Press, 2003); Michael Bliss, *The Discovery of Insulin* (Chicago: University of Chicago Press, 1982).²⁶⁵ Melzer, *Vollwerternährung*, 75-80.

²⁶⁶ Siegfried Möller, *Das diätetische Heilverfahren Schroths*, 5. Aufl. (Dresden: H. Dittmar, 1910), 26, 54, 154.

²⁶⁷ "Ich fühlte, daß in mir etwas Undefinierbares steckte, welches diese ganzen Zustände bei mir veranlaßte." As quoted in Möller, *Das diätetische Heilverfahren Schroths*, 65.

²⁶⁸ 4. Bericht: "der mir offenbarte, daß mein Körper total von Harnsäure durchsetzt sei." As quoted in Möller, *Das diätetische Heilverfahren Schroths*, 66.

a patient's hunger—or lack thereof. He strenuously disagreed with the mainstream practice of encouraging sick persons to eat whether or not they were hungry, “because nature in its exceedingly purposeful expression indicates to us through the loss of appetite that the organism currently does not need food, as it cannot utilize it.”²⁶⁹ In his view, force-feeding exacerbated disease and was counter-productive to the healing process, which functioned best in the absence of digestion and excess fluids. Because the patient's body instinctively “knew” not eating was helpful—whether or not it signaled this by loss of hunger—Möller found intestinal nutrition with meat solutions the height of malpractice, contradicting everything allopathic physicians claimed was important in clinical dietetics: to do no harm, refresh the patient, and benefit him.

Did doctor or mother or nature know best?

Physiologist Max Rubner wrote at the start of a study on German dietary trends,

I have often encountered the opinion that the purpose of the scientific study of general nutrition is to meddle with everyone's personal habits by making recommendations as to how each individual should order his daily diet; and more commonly I have heard the preconception that the most science does is contribute to the unrest of the masses, because with its utopian goals it demands for every person a diet of luxuries that can never be realized. These antipathies are associated with the thoroughly inadequate biological education of our educated and uneducated classes, which maintain that because they eat every day, everyone must inherently know best what rational and correct nutrition is.²⁷⁰

Between 1890 and 1930, nutritional science—having established itself in laboratories, barns, and fields—made its way into kitchens and onto dinner tables. Whereas once individuals chose their

²⁶⁹ “Denn die in ihren Äußerungen so überaus zweckmäßige Natur deutet uns durch den Verlust des Appetites an, daß der Organismus der Nahrung zurzeit nicht bedarf, da er solche gar nicht in einer ihm dienlichen Weise verarbeiten kann.” Möller, *Das diätetische Heilverfahren Schroths*, 45-48, qtn on 45.

²⁷⁰ “Ich bin des öfteren der Meinung begegnet, daß es die Aufgabe des wissenschaftlichen Studiums der Volksernährung sei, jedem Menschen bestimmte Vorschläge zu machen, wie er, unter Eingreifen in individuelle Gewohnheiten, sein tägliches Mahl zusammensuchen solle; und noch häufiger habe ich das Vorurteil gehört, daß die Wissenschaft höchstens zur Aufregung der Massen beitrage, indem sie unter utopischen Zielen für jeden Menschen eine Luxusernährung verlange, die sich nie realisieren lasse. Es hängen aber diese Antipathien zum Teil mit der durchaus mangelhaften biologischen Vorbildung unserer gebildeten und ungebildeten Klassen zusammen, die da meinen, daß jeder Mensch von Haus aus, da er doch jeden Tag ißt, am besten selber wissen müsse, was eine rationelle und richtige Ernährung sei.” Max Rubner, *Wandlungen in der Volksernährung* (Leipzig: Akademische Verlagsgesellschaft, 1913), 5.

diets based at least in part on what their “constitution” required, by the early twentieth century they were expected to use scientific guidelines to construct their diets when sick and well.²⁷¹

Rubner’s comment reflects this (anticipated) transition of authority from the eating and drinking individual to the scientific expert, a transition that could be described as a movement from internal to external sources of authority. In the new knowledge economy, expertise was gendered and classed, but it was also more distributed than conventional experts wanted to believe.²⁷²

Authors of books on food and nutrition actively disputed how to know what should be served on German tables: did the eater’s body possess innate knowledge? Or had those instincts been ruined by modern living? Did the doctor always know best, or was his constantly changing laboratory information inferior to nature’s timeless wisdom? When the patient was in the clinic or hospital, it was easier to believe that the physician’s expertise should overrule the individual’s internal sensations or his usual dietary habits; in the sick room and in the kitchen, however, the doctor’s authority was less certain. Sometimes female caregivers were expected know how to care for the sick by virtue of their sex; sometimes they were cast as completely ignorant of what was “really” good for the patient; and increasingly women asserted their expertise via domestic science (*Haushaltskunde, Haushaltswissenschaft*), a new field of systematized female learning.²⁷³

²⁷¹ The individual as expert on his or her own eating and digestion has ancient roots. See e.g. Steven Shapin, “The Long History of Dietetics: Thinking about Food, the Self, and Knowledge” (keynote delivered at the annual meeting of the DGGMNT, Maastricht, Netherlands, 24-26 Sept. 2010).

²⁷² Hau, “The Humane Expert”; Joel Moky, “Knowledge, Health, and the Household,” in *Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton University Press, 2002), 218-283; Uwe Spiekermann, “Redefining Food: the Standardization of Products and Production in Europe and the United States, 1880-1914,” *History and Technology* 27, no. 1 (March 2011): 11-36; *ibid.*, “Science, Fruits, and Vegetables: A Case Study on the Interaction of Knowledge and Consumption in Nine-teenth- and Twentieth-Century Germany,” in *Decoding Modern Consumer Societies*, ed. Hartmut Berghoff and Uwe Spiekermann, 229-248 (New York: Palgrave Macmillan, 2012). In the second article, Spiekermann argues that while this knowledge was widespread, it was not widely acted upon. This fact does not change my discursive analysis.

²⁷³ Inga Wiedemann, *Herrin im Hause. Durch Koch- und Haushaltsbücher zur bürgerlichen Hausfrau* (Pfaffenweiler: Centaurus, 1993).

Just as Rubner perceived public ignorance of nutrition through the lens of his laboratory research, so Ernst von Leyden did through his medical practice. The clinic was a liminal space where clinicians applied scientific experiments and analyses to patients' bodies and complaints—as Lahmann did with blood pH—and where they produced new knowledge from experiences with patients like R. K. There they also encountered ordinary

Eight Common Questions
Patients Ask Doctors

1. Which foods are more or less nutritious?
2. Which foods are easy or hard to digest?
3. What is a “weak stomach”?
4. Which foods are unhealthy?
5. Why is “ballast” important?
6. Are spices beneficial or harmful?
7. How much liquid should I drink?
8. How much food do I need?

Germans' questions, habits, suspicions, and vernacular knowledge, as this list of common questions that von Leyden fielded in his clinic demonstrates.²⁷⁴

Many scientific experts like these insisted that the rules for healthy nutrition had to be imposed from outside: “It is quite wrong to think that one's own instinct, appetite, and hunger stipulate what is correct for nutrition, because they are often distorted by flawed habituation or through morbid influences,” wrote neurologist Dr. Otto Dornblüth (1860-1922).²⁷⁵ Not only was the appetite of healthy individuals susceptible to contingencies like emotional state, mental or physical fatigue, the appearance of the food, one's dining companions, and “peculiarities of the seating arrangements,” but “this is even more true for the sick.”²⁷⁶ In other words, the very externalities—a neat table, attractive dishes, and a relaxed atmosphere—that homemakers provided in order to maximize internalities like the secretion of digestive juices were the same

²⁷⁴ Ernst von Leyden, “Diätetik (Ernährungstherapie) des Gesunden,” in *Handbuch der Ernährungstherapie und Diätetik*, ed. Ernst von Leyden, 1. Aufl., vol. 1, no. 1, 219-233 (Leipzig: Georg Thieme, 1897), 223-229.

²⁷⁵ “Es ist durchaus falsch, zu glauben, daß der eigene Instinkt, Appetit und Hunger immer das richtige für die Ernährung abgeben, denn sie sind oft durch verkehrte Gewöhnung oder durch krankhafte Einflüsse gestört.” Dornblüth, *Diätetisches Kochbuch* (1905), 9.

²⁷⁶ “Der Appetit hängt beim Gesunden sehr von Zufälligkeiten ab: Aufregungen, Ärger, Sorgen, geistige und körperlich Überanstrengung, Eigenheiten der Tischordnung, der Küche, der Umgebung und vieles andere können ihn verringern; gute Stimmung, geschickte Zubereitung und Anrichtung der Speisen, angenehme Gesellschaft usw. können ihn steigern.” Dornblüth and Dornblüth, *Diätetisches Kochbuch* (1913), 2.

ones, that in his expert opinion, could skew the entire system. Similarly, a bad mood, uncomfortable surroundings, or a lack of fresh air could mask hunger signals. This is why von Leyden and Georg Klemperer insisted that loss of appetite was no reason not to feed a patient.

According to these conventional authorities, the sources of “flawed habituation” and “morbid influences” on what and how to eat unfortunately included the places a person was most likely to get information: the parental home, the community, random advice one heard or saw, and cultural influences like the fashionable predilection for thinness.²⁷⁷ Dornblüth went so far as to warn that laypersons who made their own dietary decisions were gambling with their health: “independent action is always risky and may cause even greater harm, because in addition to the instantaneous effects ... very often permanent consequences develop that though inconspicuous at first are then hard to rectify.”²⁷⁸ Those who declined to follow the good doctor’s advice could find themselves in need of drastic medical care later.

Mainstream physicians often claimed to have access to not just the best but the only knowledge about nutritional needs and dietary recommendations. And yet, this authority was not infallible: a comparison of the four editions of Dornblüth’s dietetic cookbook published over three decades finds repeated revisions of the scientific truths contained therein.²⁷⁹ Readers were expected to accept the new pronouncements with the same confidence in the scientific method as the old ones. “Physicians constantly wish that women would interest themselves with the accomplishments of science and their practical use in feeding the sick,” wrote Hedwig Heyl at

²⁷⁷ Dornblüth and Dornblüth, *Diätetisches Kochbuch* (1913), 94; Merta, *Wege und Irrwege zum modernen Schlankheitskult*.

²⁷⁸ Dornblüth: “selbstständiges Vorgehen ist immer gewagt und kann um so größeren Schaden bringen, weil außer den augenblicklichen Wirkungen, ... sehr oft dauernde, zunächst unscheinbare Folgen eintreten, die weiterhin schwer wieder gutzumachen sind.” *Diätetisches Kochbuch* (1905), 1-2.

²⁷⁹ E.g., on Voit’s numbers and the protein minimum, which dropped from 100 g/day in 1897 to 70-84 g/day in 1927. Otto Dornblüth, *Kochbuch für Kranke* (Leipzig: H. Hartung & Sohn, 1897), 19; Dornblüth, *Diätetisches Kochbuch* (1905), 19; Dornblüth and Dornblüth, *Diätetisches Kochbuch* (1913), 94-97; Otto Dornblüth, Hedwig Dornblüth, and Karl von Noorden, *Diätetisches Kochbuch*, 4. Aufl. (Leipzig: Curt Kabitzsch, 1927), 74.

the beginning of her second book on dietetics.²⁸⁰ Under the warrant of progress, these authors accepted a certain amount of change—at their discretion. Dornblüth and Heyl distrusted the internal knowledge of ordinary Germans and the decision-making capabilities of the average *Hausfrau* compared to the scientific knowledge of physicians, and they advocated for the substitution of his medical knowledge for their instincts and her hand-me-down traditions.

By contrast, cookbook writer Luise Holle (1864-1936) believed that housewives could feed their families well with a combination of natural instinct and the right information about nutrition and economics. Davidis and Holle (and Heyl) exemplify the new, bourgeois trend of advice literature by female authors for female readers that replaced the earlier genre of *Hausväterliteratur* over the course of the nineteenth century.²⁸¹ They wrote neither for expert (male) chefs nor for seasoned (female) cooks but for young women starting households upon marriage. Their authority in the field of nutrition came from their practical experience in everyday cooking, from their familiarity with a wide variety of literature on health and housekeeping, and from the kind of experimental cooking, baking, and canning that domestic scientists performed in the course of their teaching and writing. Holle not only believed housewives should think for themselves, she encouraged them to teach their daughters early and often to trust their own judgment and experience, not just as cooks but as tasting, eating, and digesting bodies.²⁸² “Good taste that has not become used to bad habits,” she advised, “will almost always instinctively make the right choice. Cooking according to scientific principles and according to good taste almost always coincides.”²⁸³ Although she acknowledged the possibility

²⁸⁰ “Von ärztlicher Seite wird immer wieder gewünscht, daß sich die Frauen gründlich mit den Errungenschaften der Wissenschaft und ihrer praktischen Anwendung in der Krankendiät beschäftigen.” Hedwig Heyl, *Diätküche* (Berlin: C. Habel, 1929), [III].

²⁸¹ Annemarie Wilz, “Haushaltsratgeber,” in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 27-86 (Bielefeld: Regionalgeschichte, 1998), 27-33.

²⁸² Davidis and Holle, *Praktisches Kochbuch* (1901), 1-2.

²⁸³ “Im übrigen wird ein nicht durch falsche Angewöhnung irre geführter guter Geschmack gewissermaßen

that “taste” could be corrupted—perhaps by too much oysters and champagne—Holle did not seek to replace instinct with science but rather to confirm it.

The German public could be forgiven for thinking that they knew something about what to eat and drink, for they were frequently assured that science had proven the correctness of many of their foodways. For example, Holle counseled that a good diet should contain enough sodium (Na^+) from cooking salt (NaCl) to balance out the potassium from other compounds, presumably because excess potassium (K^+) was harmful to the proper functioning of the heart and nerves.²⁸⁴ Rice was low in potassium and therefore did not need to be salted; but meat, grains, potatoes, and legumes were rich in potassium and therefore were salted not merely out of habit but because the body needed chemical balance between the positively charged Na^+ and K^+ ions.²⁸⁵ Scientists had shown that “good taste” was important not just for aesthetic or sensory reasons but because it enhanced digestion and signaled important, underlying nutritional relationships.²⁸⁶ A respected cookbook like Holle’s would grant a passing familiarity with the basics of nutrition and ensure that good taste did not go bad, allowing Germans to feel comfortable “following their gut” (or taste buds).

If there was not a clear dichotomy between conventional experts with their dietary knowledge and the lay public who had none, neither was there an easy distinction between orthodox medical practitioners and their heterodox competitors. To be sure, many folk healers rejected medical science and the therapies it recommended—especially in the nineteenth

instinktiv das richtige treffen.” Davidis and Holle, *Praktisches Kochbuch* (1901), 770. See also their introduction, 1.

²⁸⁴ Davidis and Holle, *Praktisches Kochbuch* (1901), 771. This reasoning also explained why salted herring paired so well with string beans or boiled potatoes and why salted meat “demanded” (*verlangt*) creamed peas.

²⁸⁵ Gustav von Bunge, “Über die Bedeutung des Kochsalzes und das Verhalten der Kalisalze im menschlichen Organismus” (Magister-Arbeit, Univ. Dorpat, 1873); *ibid.*, “Der Kali-, Natron- und Chlorgehalt der Milch, verglichen mit dem anderer Nahrungsmittel und des Gesamtorganismus der Säugetiere” (diss., Univ. Dorpat, 1874); Clive M. McCay, “Gustav B. von Bunge (1844-1920),” *Journal of Nutrition* (1953): 1-19.

²⁸⁶ See also Anna Martens, *Ernährungskuren für Kranke und solche, die gesund bleiben wollen* (Trogen, Schweiz: Hygiea-Verlag, 1923), 6-8; and “Interessante Essensgewohnheiten,” *DH* 28, no. 15 (9 Jan. 1929): VIII.

century—but over the course of the early twentieth century, alternative physicians increasingly if selectively adopted laboratory methods and results. Lahmann’s complicated relationship to academic medicine is a case in point. On the one hand, he claimed that whatever its current reputation, medicine was not a science but an art that had to be intuited because it could not be taught.²⁸⁷ He preached a gospel of hygienic common sense: “My little son, who is at present three and a half years old, knows more about practical hygiene than many a professor who has worked with the microscope or test-tube all his life and has nevertheless become gouty and diabetic,” he wrote.²⁸⁸ Besides, if current physiological and pathological chemistry did not support all of his theories, the fault lay with them for being undeveloped, since his clinical successes outweighed his inability to explain them with laboratory results. On the other hand, Lahmann’s body concept clearly owed something to chemical principles such as concentration, diffusion, and osmosis, and he was hailed as the father of scientific naturopathy after his death.²⁸⁹

Despite their obvious differences, both the allopath Otto Dornblüth and the naturopath Heinrich Lahmann rejected the authority of their readers’ bodies, because they were of the opinion that modern eating habits had degenerated so much that Europeans no longer knew what was good for them. While the former wanted to replace instinct with the authority of science, the latter wished to (re)instate natural instinct, backed by science. For instance, like many of his contemporaries Lahmann championed breast milk as the best and most wholesome food, but he doubted he could find enough lactating women with “pure” diets from which to determine

²⁸⁷ If his diagnostic acumen and bedside manner could not be taught, his therapeutic principles could be. Elisabeth Boer, *Chronik des Kurorts Weisser-Hirsch. Von den Anfängen bis zur Eingemeindung* (Dresden: Wilhelm und Bertha v. Baensch Stiftung, 1932), 60-61.

²⁸⁸ Heinrich Lahmann, *Natural Hygiene, or Healthy Blood* (Google eBook) (Swan Sonnenschein & Co, 1898), 3; orig. in *Diätetische Blutentmischung*, 12.

²⁸⁹ “Dr. Lahmann tot †,” *ApdT* 7, no. 6 (15 June 1905): 161; [Dr. Peter Ziegelroth], “Dr. Lahmann!” *ApdT* 7, no. 7 (15 July 1905): 193-198; “Die Lahmann-Gedächtnisfeier im Bürgersaale des Rathauses zu Berlin,” *ApdT* 7, no. 12 (15 Dec. 1905): 363-369; Walter Georg Esch, “Es wird Licht! Eine Bestätigung von Lahmann’s Lehre durch die medizinische Fachpresse,” in *ApdT* 8, no. 1 (15 Jan. 1906): 7-8; Alfred Störmer, “Fünfzig Jahre Dr. Lahmann’s Sanatorium ‘Weisser Hirsch,’” *Ärzteblatt für Mitteleuropa* 72 (1938): 84-85.

biological requirements for fats and minerals, so he based his pronouncements on analyses of cow's milk!²⁹⁰ Reflecting this discourse of taste degeneration, laypersons frequently described children as instinctively sensitive to the nutrition that their bodies needed: raw fruits and veggies for the nutrients and sugar as the best and most easily digestible fuel for their still-growing, always-moving bodies. One mother counseled that a child should be not be forced to eat a food that did not appeal to it—even milk or fruit—lest it cause stomach upset and vomiting.²⁹¹

Academic researchers and allopathic physicians therefore were not the sole creators, possessors, or purveyors of knowledge about the possible interactions between bodies and foods in late-nineteenth- and early twentieth-century Germany. Other individuals and groups used nutritional science to improve the health of themselves and their dependents (lay persons, folk healers), to secure social influence (naturopaths, sanatorium founders), as a business proposition (Liebig, Reformhaus), or merely as a curiosity (exhibition-goers). Precisely because definition of “science” varied and sometimes conflicted, Germans were exposed to a high volume of ideas about it.

Conclusion

Hedwig Heyl's career as an authority on nutrition was bracketed by two books on dietetics, forty years apart, each applying laboratory science and hospital medicine to domestic cookery. Through them, Heyl acted as one of many nodes at which different strands of nutritional knowledge met as they circulated among the various sites where clinical dietetics was practiced. Otto Dornblüth was another such node. In the preface to his popular volume, he credit-

²⁹⁰ Lahmann, *Diätetische Blutentmischung*, 31-36. Admirers propagated his skewed results for years afterward: e.g. Fischer-Dückelmann, *Die Frau als Hausärztin* ([1907?]), 84.

²⁹¹ “Rohes Gemüse als zeitgemäße Kost,” *DH* 14, no. 44 (23 July 1916): 1-2; “Weshalb essen Kinder gern Zucker und Süßigkeiten?” *DH* 23, no. 1 (1 Oct. 1924): III; “Meinungsaustausch. Soll man Kinder dazu zwingen, alles zu essen?” *DH* 25, no. 14 (5 Jan. 1927): X.

ed German research institutions with establishing the basis of scientific nutrition.²⁹² But in the short introduction to the recipe section of the second edition, Dornblüth mentioned that he had also borrowed from published domestic science experts, such as Heyl and Henriette Davidis, as well as from the unpublished wisdom of the matrons at his sanatoria, Lina Reuß in Stuttgart and Luise Heinzerling in Frankfurt am Main.²⁹³ In two later editions, Dornblüth acknowledged that his wife Hedwig had edited the “technical part” concerning the actual cooking.²⁹⁴ Books like Heyl’s and Dornblüth’s combined the knowledge and influence of multiple actors and exemplify the porosity of the boundaries between laboratory and kitchen, clinic and sick room.

Dietetics therefore encompassed a variety of advisers, advisees, and sick bodies. Whereas to the housewife the person was “the sick one” (*der Kranke*) who needed light but strengthening food, to the physician the patient was “the tuberculosis case” or “the nervous stomach.” The advice domestic experts like Heyl and Holle gave and received reveals an underlying, intuitive understanding of illness as muscular and digestive weakness. Housewives themselves diagnosed and treated conditions that disrupted a family member’s normal eating habits but that did not warrant either hospitalization or a doctor’s care (cough, headache, pregnancy nausea, stomach flu). Simple diagnoses warranted simple dietary prescriptions. Cookbook authors rarely differentiated among “the sick,” because both housewives and nurses were supposed to defer to a professional’s orders for serious conditions (diabetes, ulcers, underweight). According to allopaths like von Leyden and Dornblüth, these conditions did not necessarily arise from one’s eating habits, but there was almost always an appropriate diet once the patient had been diagnosed. For naturopaths like Lahmann and Möller, however, wrong diet was more often the

²⁹² Dornblüth, *Kochbuch für Kranke* (1897), vi.

²⁹³ Dornblüth, *Diätetisches Kochbuch* (1905), 144-145.

²⁹⁴ Dornblüth and Dornblüth, *Diätetisches Kochbuch* (1913), [III]; Dornblüth, Dornblüth, and Noorden, *Diätetisches Kochbuch* (1927), [III].

source of pathology, and so a correct one was inevitably part of the treatment or even cure.

Close attention to the details of all these dietetic paradigms demonstrates that the criteria Germans used to choose what foods and drinks to serve to sick family members or patients combined common knowledge, convenience, finances, and the developing nutritional science of the nineteenth and early twentieth centuries. In an era when all parties had sometimes tenuous claims to scientific truth, Justus von Liebig's endorsement of the nutritive properties of meat merely reinforced the popularity of meat broth, which had been a sick food since at least the late eighteenth century. Opinions about the (in)digestibility of certain foods frequently corresponded with experiments on the nervous and hormonal stimuli involved in the digestive process, and observations by microscope and calorimetric experiments on bodily wastes showed that human bodies cannot in fact utilize certain food components (gristle, cellulose, bran).²⁹⁵ Acidemia (low blood pH) is actually deadly in conditions such as diabetes mellitus, and today we know that for some persons, the uric acid produced in the breakdown of purine-rich foodstuffs (namely red meat) does literally precipitate gouty attacks. Sometimes one generation's scientific truth was the next generation's common sense, whether or not the leading experts still considered it scientific.

Although orthodox physicians like optometrist and German Hygiene Museum co-founder Otto Neustätter (1870-1943) were then leading a campaign against official and public acceptance of homeopaths, hydropaths, herbalists, and other “quacks,”²⁹⁶ lay Germans seem to have cared less about professional or even ideological differences than many practitioners of any camp did. Lahmann characterized the average patient's medical philosophy this way: “Choose the best of everything: in blending the two opposites think you have chosen the most correct [parts of

²⁹⁵ Schilling, *Die Verdaulichkeit der Nahrungs- und Genußmittel*.

²⁹⁶ Hau, “The Humane Expert,” 109. Neustätter had a change of heart after World War I, deciding during the Weimar Republic that integrating folk medicine into mainstream medical institutions could decrease the influence of the former and increase the legitimacy of the latter among the general public.

each].”²⁹⁷ (This sounds a lot like Dornblüth’s methodology; Heyl did it too in her second book on dietetics.²⁹⁸) Unsurprisingly, Germans sought relief for health ills wherever they could find it. For our purposes it is crucial to note that while they were consuming health care services and products wherever they could find them, they were also absorbing a variety of paradigms: calorie theory, contagionism, anthroposophy, cellular pathology, dysaemia, constitutionalism.²⁹⁹

This porosity of boundaries created a continuum of scientific knowledge and enabled the development and propagation of a telescopic perspective. For example, in 1927 the authors of an educational-promotional pamphlet for the Leipzig-based life-reform product manufacturer

Thalysia explained the kidneys’ import in telescopic language:

And when all organs have been considered we see their harmonious cooperation, their interdependence, their step-wise intervention in the course of life. They are so close together, these various activities and functions of the institutions that each individual has to rely on everyone else, and all on one. We understand that a disturbance at one point disturbs everything and nothing is normal again until that problem is resolved. Disturbances can occur anywhere. As in the best-oiled machine, so also in the delicate, microscopic structures of the human body! And so also in the finest chemical reactions on which life is based!³⁰⁰

All the parts of the body interconnected, so an insult to one was an insult to all, and it was impossible to treat illness in one organ without affecting all the others. By extension, the health of one individual affected the health of all of them. Over the course of the 1920s and 1930s, a

²⁹⁷ “Von Allem das beste zu wählen: in der Verquickung beider Gegensätze das Richtige erwählt zu haben glauben.” Lahmann, *Die wichtigsten Kapitel*, 1.

²⁹⁸ Heyl, *Diätküche*, 9-10. She cites both mainstream and alternative authors, including Karl von Noorden and Emil Abderhalden on the one side and Ragnar Berg, Mikkel Hindhede, and Siegfried Möller on the other.

²⁹⁹ Carsten Timmermann, “Constitutional Medicine, Neuromanticism and the Politics of Antimechanism in Interwar Germany,” *Bulletin of the History of Medicine* 75, no. 4 (2001): 717-740; Hau, “The Humane Expert.”

³⁰⁰ “Und—wenn alle Organe durchgeprüft sind—sehen wir ihr harmonisches Zusammenwirken, ihre gegenseitige Abhängigkeit, ihr etappenweises Eingreifen in den Verlauf des Lebensprozesses. Sie hängen so eng zusammen, diese einzelnen Tätigkeiten und Aufgaben der Organe, daß jedes einzelne auf alle anderen angewiesen ist, und alle auf ein einzelnes. Wir verstehen, daß eine Störung an einer Stelle alles stört und alles erst wieder normal wird, wenn jene Störung behoben ist. Störungen können überall eintreten. Auch in der bestgeölten Maschine; wie erst in den zarten, mikroskopischen Gebilden des menschlichen Organismus! Und wie erst in den feinsten chemischen Reaktionen, auf denen das Leben—als natürlicher Vorgang betrachtet—beruht!” Hans Garms and Max Reach, *Wasserstauung und Zuckerüberschwemmung im Menschen. Gemeinverständlicher Ratgeber für Nieren-, Blasen- und Zuckerkrankte*, Thalysia-Ratgeber Nr. 12 (Leipzig: Thalysia Paul Garms, [1929?]), 3-4.

version of the telescopic body extending from micronutrients to a particular collective endpoint, the *Volkskörper*, gained increasing influence in the German national imagination. This “people’s body” metaphor of social and political belonging was not merely organic but also biological. The people “grew” out of their soil and were connected with one another, like cells in one body.³⁰¹ A telescopic bond among the cells, tissues, and organs of the “social body” enabled Germans to imagine themselves as an entity that ate, reproduced, and was susceptible to cancer or infection. What was healthy for the one to eat was healthy for the whole during the Weimar period; and when the National Socialists come to power, what they perceived as necessary for the survival of the state was made good for the one. That included what Germans served on their dinner tables. The turning point that summed their disparate bodies into one nation, one body was their collective experience of World War I, the subject of Part Two. Before then we must discuss more closely the telescopic perspective (Chapter 2) and the ability of this metaphor to synthesize scientific knowledge from the lowest to the highest levels of magnification (Chapter 3).

³⁰¹ Especially on the literalization of blood and soil metaphors, Uli Linke, “Between Blood and Soil: Body Politics in Nazi Germany,” in *Blood and Nation: The European Aesthetics of Race* (Philadelphia: University of Pennsylvania Press, 1999), 197-211.

Chapter 2: Under the Hygiene Eye: Nutrition at the German Hygiene Museum

Brussels Sprouts with Curry Rice and Tomato Sauce

4 persons.

Ingredients: 2 lb Brussels sprouts, 1 lb tomatoes, 1 lb brown rice, 3 onions, oil, curry, Bisalz, caraway powder, Frugola.

Clean and wash the Brussels sprouts. Sweat 1 onion in plenty of oil until translucent, [then] sauté the Brussels sprouts in the pan. Just before they are done, flavor with celery salt and caraway powder.³⁰²

The rice is soaked in salt water, drained, rinsed with clear cold water, and drained well. Now one cooks finely chopped onion in oil, adds a generous amount of curry and some salt, and stirs in the rice.

This should remain granular.³⁰³

The tomatoes are washed, cut into slices, and sautéed until soft in oil heated with a [chopped] onion. Then press them through a sieve and flavor with salt and some Frugola. One could also make the sauce creamy with a little dextrinated flour.³⁰⁴

³⁰² “Rosenkohl mit Curryreis und Tomatentunke. 4 Personen. Zutaten: 2 Pfd. Rosenkohl, 1 Pfd. Tomaten, 1 Pfd. Vollreis, 3 Zwiebeln, Öl, Curry, Bisalz, Kümmelpulver, Frugola. Den Rosenkohl gut verlesen, waschen. In einem Topf 1 Zwiebel in reichlich Öl glasig schwitzen, den Rosenkohl darin weichdünsten. Kurz ehe er gar ist, mit Selleriesalz und Kümmelpulver würzen. Der Reis ist wie Seite 18 beschrieben, zuzubereiten. Die Tomatentunke wie Seite 21.” Alfred Richter and Helene Richter, *Fleischlose Kost. Praktische Winke*, 5. Aufl. (Dresden: Naturheilinstitut Alfred Richter, [after 1933]), 35. Bisalz is a Natura-brand salt mixture high in both sodium and potassium. Frugola is Natura-brand vegetable stock made without animal meat or fat and sold in Reformhäuser since 1909.

³⁰³ “Der Reis wird in Salzwasser ausgequollen, abgeschüttet, mit klarem, kaltem Wasser ab gespült, get ab[ge]tropfen lassen. Nun dünstet man eine feingeschnittene Zwiebel in Öl glasig, gibt reichlich Curry und etwas Salz hinzu und schwenke darin den Reis. Dieser muß körnig bleiben.” “Curryreis und gefülltes Weißkraut (Krautwickel),” Richter and Richter, *Fleischlose Kost*, 18.

³⁰⁴ “Die Tomaten werden gewaschen, in Scheiben geschnitten, in das mit einer Zwiebel zuvor heißgestellte Öl gegeben und weichgedünstet. Dann schlage man dieselben durch ein Sieb und schmecke die Tunke mit Salz und etwas Frugola ab. Evtl. kann man die Tunke noch mit etwas dextriniertem Mehl sämig machen.” “Kartoffelmus mit Tomatentunke,” Richter and Richter, *Fleischlose Kost*, 21. Dextrinated flour has been lightly browned over dry heat to start the breakdown of complex, long-chain starches into smaller and more easily digestible carbohydrates.

[Nutrition] deserves this preferential position, because it is arguably the most important issue of personal and public hygiene, which has decisively determined the fate of peoples from pre-historic times to the present.³⁰⁵

In late-nineteenth and early twentieth-century Germany, copious amounts of (mis)information about the effects of food on bodies circulated in the public sphere. Having surveyed the knowledge about nutrition shared among laboratory scientists, domestic scientists and housewives, and regular and irregular medical practitioners in the previous chapters, now we can ask, why was nutrition so important to “the fate of peoples”? It may seem obvious to us now that diet contributes to individual well-being, but how could it affect collective health? Over the course of the early twentieth century, German hygienists connected the biochemistry of macromolecules to normal individual physiology, “good” table practices to healthy families, and strong family units to a robust nation, *Volk*, and/or race. This is what I call the “telescopic perspective.” As a mentality that spread from conservative nationalists in the 1900s to government functionaries during World War I and finally to reformists across the political spectrum in the interwar period, it describes the rhetoric of biopower that increasingly surrounded public discussions of nutrition, if not actual practices.

The telescopic perspective was a way of thinking that expanded upon the individual-collective duality by recognizing more than two levels of magnification. “The” individual could be divided into numerous organ systems and those systems into their organs or tissues. One could focus on ever smaller component parts, down to cells and molecules like vitamins, carbohydrates, and water. The more biochemists learned about these minute levels of food

³⁰⁵ “Sie verdient diese Vorzugsstellung, denn sie ist wohl die wichtigste Frage der persönlichen und der öffentlichen Gesundheitspflege, die seit Urzeiten bis heute das Schicksal der Völker entscheidend bestimmt hat.” Deutsches Hygiene-Museum Dresden, *Führer durch das Deutsche Hygiene-Museum Dresden, mit einem Vorwort über die Internationale Hygiene-Ausstellung* (Dresden: Scholz & Co., 1930), 28 [hereafter *Museums-Führer*]. Max Rubner made a similar statement almost two decades earlier: “The question of the people’s nutrition is doubtless of the greatest importance for the qualities of a nation.” *Wandlungen in der Volksernährung* (Leipzig: Akademische Verlagsgesellschaft, 1913), 3.

chemistry, the more reductive the science of nutrition became.³⁰⁶ On the social end of the telescope, the ultimate collective could be either the German nation or race (*Volk*, *Volkskörper*, or *Rasse* depending on one's politics), and there were many smaller collectives. Some overlapped, such as families or professions, while others were hierarchical, rather like the levels of government: city, region, state. Well into the twentieth century, Germans identified at least as strongly with sub-national communities (namely their states: Saxony, Bavaria, Mecklenburg) as they did with the German Empire (*Kaiserreich*, *Deutsches Reich*, *Drittes Reich*).

Altogether, these intermediate levels filled out the body that telescoped beyond the individual: molecules, cells, tissues, organs, systems, body, family, town, state, country, people or race, world. From World War I into the 1940s, one increasingly common way of naming the larger social body to which Germans belonged was the metaphor of the *Volkskörper* ("body of the people").³⁰⁷ This was variously equivalent to the political unit of the country ("the German Empire"), the cultural unit of the nation ("Germany"), or the biological unit of the race ("Germans" or "Aryans"). As a hybrid bio-cultural unit, *das Volk* (the people) sometimes crossed political boundaries as "the German ethnic group" (*Volksgemeinschaft*), while in compound words it could mean "the population" (*Volkswirtschaft*, national economy) or "the community" (*Volksschule*, community school).³⁰⁸

Health was a commutative property of the telescopic body. With each level of magnification connected to the ones above and below it, whatever facts had been discovered about one

³⁰⁶ E.g. Dr. E. Rothlin, "Die physiologischen Grundlagen des Ernährungsproblems," *Naturwissenschaftliche Umschau der Chemiker-Zeitung* 10, no. 9 (Sept. 1921): 129-135.

³⁰⁷ Thorsten Halling, Julia Schafer, and Jörg Vögele, "Volk, Volkskörper, Volkswirtschaft—Bevölkerungsfragen in Forschung und Lehre von Nationalökonomie und Medizin," in *Das Konstrukt "Bevölkerung" vor, im und nach dem "Dritten Reich"*, ed. Rainer Mackensen and Jürgen Reulecke, 388-428 (Wiesbaden: Verlag für Sozialwissenschaften, 2005).

³⁰⁸ Peter Walkenhorst, *Nation-Volk-Rasse: Radikaler Nationalismus im Deutschen Kaiserreich 1890-1914* (Göttingen: Vandenhoeck & Ruprecht, 2007), esp. 80-165; see also Wolfgang König, *Volkswagen, Volksempfänger, Volksgemeinschaft: "Volksprodukte" im Dritten Reich, vom Scheitern einer national-sozialistischen Konsumgesellschaft* (Paderborn: Schöningh Verlag, 2004).

could be scaled up or down to fit the others. Moreover, disease or injury in one part of the telescopic body affected all parts. So, cells' requirement for protein as their physical substrate translated into a dietary need for meat, while the degeneracy of the Aryan race could be traced to characteristics an individual inherited from his or her parents. The “scale jumping” the telescopic body enabled thus made the basic sciences relevant to both personal hygiene and public health, from the responsible citizen to the metaphorical social body.³⁰⁹ However, the point of entry for interventions was almost always the eating, drinking, working, reproducing individual. In this chapter we will examine the telescopic body in relation to nutrition. As experts increasingly recommended consuming not just food but nutrients, the health of the collective composed of all those eating and digesting individuals came to depend on microscopic molecules and chemical qualities.

The German Hygiene Museum in Dresden (Deutsches Hygiene-Museum Dresden, DHMD³¹⁰) and its antecedents exemplify telescopic thinking. Well before the opening of its permanent home in 1930, the museum was a leader in both hygiene education and the corporatist language of the *Volkskörper*. With its iconic “hygiene eye” logo,³¹¹ the museum has long been associated with ocularcentric methods of medical popularization.³¹² Both the hygiene eye and a particularly strong drive to look beyond individuals to national health originated with the industrialist and philanthropist Karl August Lingner. We will examine his thoughts about the

³⁰⁹ On “jumping scales,” Neil Smith, “Contours of a Spatialized Politics: Homeless Vehicles and the Production of Geographical Scale,” *Social Text* no. 33 (1992): 54-81, esp. 60, 66, and 77.

³¹⁰ I will refer to the museum in Dresden with the acronym DHMD (as in the URL dhmd.de), even though for the first 8 decades of its existence, it used the acronym DHM, which now stands for the Deutsches Historisches Museum in Berlin (est. 1987).

³¹¹ According to legend, un-inspired by any of the submissions for the design contest held for a poster advertising the International Hygiene Exhibition in 1911, Lingner dreamed up a single eye hovering against a starry night sky and bypassed the jury to give the contract to Munich Secession artist Franz von Stuck (1863-1928). Klaus Vogel, *Das Deutsche Hygiene-Museum Dresden 1911-1990* (Dresden: Stiftung Deutsches Hygiene-Museum, 2003), 42.

³¹² Christine Brecht, “Schauplätze der Volksgesundheit: Hygieneausstellungen in Kaiserreich und Weimarer Republik” (diss., Univ. Bielefeld, in progress); Rosmarie Beier and Martin Roth, eds., *Der Gläserne Mensch—Eine Sensation* (Stuttgart: Verlag Gerd Hatje, 1990).

relationship between individual citizens and the state and about the best way to practice hygiene—namely, by disseminating this information to the public at large. It was as much an expression of Lingner’s collectivist mentality and social hygiene principles as it was sound business practice to make otherwise mundane or specialized knowledge socially and politically relevant and therefore deserving of public and private funding and attention.

One interpretive difficulty of working with DHMD sources is that it is convenient to speak of “the museum” as a cohesive decision-making entity. The individuals behind that institutional identity cultivated a unified public front, but they often disagreed on the museum’s mission and how to pursue it. We will meet Georg Seiring, Lingner’s long-time secretary who succeeded him as the head of the museum, and Drs. Martin Vogel and Bruno Gebhard, two of the medical experts who shaped the institution’s messages and their presentation. The spokespersons at the DHMD touted it as a pioneer in self-education, and critics often remarked on the spectacular visuality of its displays and teaching materials. However, there was internal and external debate about the relative efficacy of visual versus aural methods of learning. When hygiene educators experimented with two- and three-dimensional displays, film, radio, lectures, and in-person tours, they were trying to find a balance between entertaining the public and educating them.

Another difficulty of relying on DHMD sources is that the museum’s staff were very good at promoting the museum as *the* institution at the center of German public health education. It is true that until the National Socialists nationalized it, German public health consisted of an ad hoc combination of public and private institutions, with states granted the autonomy to make decisions about many aspects of public health.³¹³ In fact, an organization established after World

³¹³ An exception was smallpox vaccination, which had been mandated at the national level in 1874. Axel C. Hüntelmann, *Hygiene im Namen des Staates: Das Reichsgesundheitsamt 1876-1933* (Göttingen: Wallstein Verlag, 2008);

War I in order to encourage more coordination between the states, the Imperial Committee for Popular Hygiene Education (*Reichsausschuss für hygienische Volksbelehrung*), was first headquartered in Dresden (1921-1925) in order to work with the Lingner Foundation; it later moved to the national capital. It is also true that the German Hygiene Museum was one of the largest and most successful such institutions concerned with health and hygiene. But I do not want to overstate the reach of the museum's influence, as much of the history that has been written about it relies heavily on the DHMD's own, laudatory publicity about itself.³¹⁴ Therefore, because this chapter uses sources that demonstrate the message much more reliably than they do its reception, I close with a discussion of some contemporary critiques of the museum and its exhibitions from the point of view of visitors.

Finally, the self-help movement's insistence that the public consisted of rational individuals capable of critical thinking contrasted with the commonplace argument that the museum was necessary due to the widespread ignorance of proper hygiene and diet among the general population. Should the general public be trusted to draw the appropriate conclusions from already carefully designed displays? Could they be taught to think telescopically? Would they see the connections that had been drawn between nutritional science and the national economy, between their intestines and the social body? Over the course of a generation, from the earliest incarnation in 1903 of what eventually became the DHMD to the National Socialist takeover in 1935, the museum's teaching materials expected the average individual to take ever more responsibility for his own health, the health of her family, and the strength of the nation. At

Axel C. Hüntelmann, Johannes Vossen, and Herwig Czech, eds., *Gesundheit und Staat: Studien zur Geschichte der Gesundheitsämter in Deutschland, 1870-1950* (Husum: Matthiesen, 2006); Johannes Vossen, *Gesundheitsämter im Nationalsozialismus: Rassenhygiene und offene Gesundheitsfürsorge in Westfalen 1900-1950* (Essen: Klartext, 2001).

³¹⁴ E.g. Heinrich Zerkaulen, ed., *Das Deutsche Hygiene-Museum: Festschrift zur Eröffnung des Museums und der Internationalen Hygiene-Ausstellung Dresden* (Dresden: Wolfgang Jess, 1930); Heinrich Zerkaulen, *Das Deutsche Hygiene-Museum, Dresden, und seine kulturelle Bedeutung im In- und Ausland* (Dresden: DHMD, 1935); Deutsches Hygiene-Museum Dresden, *50 Jahre Deutsches Hygiene Museum Dresden* (Dresden: Landesdruckerei, 1962).

its best, the DHMD provided the knowledge visitors needed and wanted to make informed decisions for their individual and collective health; at its worst, the museum practiced “enlightenment” from above.

“Man as a model of organization”

What became the German Hygiene Museum began with a group of philanthropists, physicians, and politicians in Saxony. Among them was Karl August Lingner (1861-1916), a Dresden-based industrialist and crusader for personal health and social hygiene.³¹⁵ After bacteriological discoveries had been widely publicized in the 1880s,³¹⁶ Lingner began manufacturing personal hygiene gadgets such as bathtub back scrubbers and soap pumps. But he really made his fortune selling Odol mouthwash, which he aggressively and creatively advertised with simple yet effective ad campaigns, such as “No kisses without Odol.”³¹⁷ A portmanteau of the Greek word for “tooth” and the Latin word for “oil,” Odol was supposedly the “absolute best mouthwash in the world.” That was easy to claim, as it was one of few on the market in the 1890s, and with its white, curved-neck bottle, it has remained the most visually distinctive ones.

Lingner soon turned his money and attentions to ameliorating public health problems such as infant mortality and infectious diseases together with the likes of pediatrician Dr. Arthur

³¹⁵ Dr. Karl Greimer, “Lingner Sozial Hygiene,” *Hygiene* 22, no. 6A (June 1930): 437-444; *Zum Gedächtnis von Karl August Lingner: Gest. am 5. Juni, 1916* (Dresden: Lingner-Werke, 1926); Julius Ferdinand Wolff, *Lingner und sein Vermächtnis* (Hellerau: Hegner, 1930); Hanns-Georg Neubert, “Karl August Lingner: 1861-1916: ein Wegbereiter hygienischer Volksaufklärung” (diss., Univ. Cologne, 1971); Ulf-Norbert Funke, *Karl August Lingner: Leben und Werk eines gemeinnützigen Großindustriellen* (Dresden: B-Edition Dresden, 1996; repr. Munich: GRIN-Verlag, 2007); Helmut Obst, *Karl August Lingner. Ein Volkswohltäter?: kulturhistorische Studie anhand der Lingner-Bombastus-Prozesse 1906-1911* (Göttingen: V & R Unipress, 2005). Less reliable because more hagiographic is Walter A. Büchi, *Karl August Lingner: das grosse Leben des Odolkönigs (1861-1916). Eine Rekonstruktion* (Dresden: Edition Sächsische Zeitung, 2006).

³¹⁶ Specifically in Germany, William Coleman, “Koch’s Comman Bacillus: The First Year,” *Bulletin of the History of Medicine* 61 (Fall 1987): 315-342; Christoph Gradmann, “Robert Koch and the Pressures of Scientific Research: Tuberculosis and Tuberculin,” *Medical History* 45 (2001): 1-32; and Philipp Sarasin, Silvia Berger, Marianne Hänsler, and Myriam Spörri, eds., *Bakteriologie und Moderne: Studien zur Biopolitik des Unsichtbaren, 1870-1920* (Frankfurt am Main: Suhrkamp Verlag, 2007). In the US context, Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge: Harvard University Press, 1998).

³¹⁷ “Keine Küsse ohne Odol.” See also Manfred Scheske, Martin Roth, and Hans-Christian Täubrich, eds., *In aller Munde. Einhundert Jahre Odol* (Ostfildern-Ruit: Hatje Cantz, 1993).

Schloßmann (1867-1932), hygiene professor Dr. Friedrich Renk (1850-1928), and Dresden mayor Gustav Otto Beutler (1853-1926). They wanted to give back to their fellow Dresdeners by teaching them how to acquire and maintain health in the fast and dirty race that was modern life. And Lingner didn't mind making money in the process; this could be reinvested in other endeavors, like the National Hygiene Museum in Dresden—incorporated in 1912 and re-named in 1920. Lingner's model for this, his most long-lived institution, was Oskar Miller's technology wonder-show, the Deutsches Museum in Munich (est. 1903).³¹⁸

As he explained in his honorary doctorate acceptance speech at the University of Bern in 1912, "Man as a Model of Organization," Lingner looked to the living human body to solve many pressing social and technological problems. He stated, "It is not claiming too much when I say that every rational institution coming out of the organizing efforts of humankind is at least suggested in the masterpiece of nature, the human body. The more familiar we become with it, the clearer that will prove itself to be."³¹⁹ This sentiment recalls the ancient concept of the microcosm-macrocosm in natural philosophy. With Lingner this binary became a telescoping body of many layers, and he had conservative, nationalistic ambitions in mind for the museum that would display it.

Although he had little formal education, Lingner had studied the art of social organizing and institution building for twenty years as a businessman, and he had come to the conclusion that one must understand the individual in order to understand the group. More specifically,

³¹⁸ Karl August Lingner, *Denkschrift zur Errichtung eines National-Hygiene-Museums in Dresden* (Dresden: n.p., March 1912), DHMD Bibliothek Hyg. A III D 4765. For similar developments in the popularization of science for consumption in Britain, see Aileen Fyfe and Bernard V. Lightman, eds., *Science in the Marketplace: Nineteenth-Century Sites and Experiences* (Chicago: University of Chicago Press, 2007.)

³¹⁹ "Es ist wohl nicht zuviel behauptet, wenn ich sage, daß sicherlich alle aus der organisatorischen Betätigung des Menschen hervorgegangenen zweckmäßigen Einrichtungen in dem Meisterwerk der Natur, dem Menschenleib, zum mindesten angedeutet sind. Je mehr wir ihn kennen lernen, um so klarer wird sich das erwiesen." Karl August Lingner, *Der Mensch als Organisations-Vorbild; Gastvortrag gehalten am 14. Dezember 1912 vor dem Professorenkollegium der Universität Bern* (Bern: M. Drechsel, 1914); qtns from Karl August Lingner, "Der Mensch als Organisationsvorbild," *Annalen der Natur- und Kulturphilosophie* 13, no. 1 (1917): 15-37, here 21.

anatomy and physiology demonstrated the first of two organizational principles: the division of labor that characterized successful social institutions. Every body part had a structure that leaned itself to a specific function within the whole, such that the heart was best at pumping blood and the lungs at exchanging gases, for example. Forcing one to do the work of the other would be inefficient to say the least and deleterious to the organism at the worst. Similarly, individual persons were best suited by their physical and mental capabilities for certain jobs.³²⁰ A firm ran the best (most efficiently and profitably) if employees had appropriate assignments; a healthy society likewise required citizens to do their parts to contribute toward the common good. The goal was not just a harmonious but an economically productive whole.

The second organizational principle Lingner learned from studying the human body was the delegation of responsibility. Holding itself above the minute physiological details of the five senses and biochemical metabolism was the brain, which did not have the resources to micromanage the tasks of all the body's parts but rather delegated lower functions to them. Meanwhile, it made important decisions that affected the whole body and only needed "reports" from the body's parts when something went wrong: "Only the most important events or significant disruptions in the social body reach the attention of upper management, who then arranges appropriate measures."³²¹ This was clearly the way Lingner imagined himself in relation to the various for-profit ventures and non-profit organizations he headed.³²² Although

³²⁰ After World War I, this idea would be "imported" from the United States under the guise of "Taylorism." Franz Dienemann, *Die gesundheitlichen Grundlagen für gewerbliche Arbeit und Taylorsystem* (Dresden: Heinrich, 1920).

³²¹ "Nur die wichtigsten Vorgänge, erhebliche Störungen im Volkskörper, gelangen zur Kenntnis der Oberleitung, die nun entsprechende Maßnahmen anordnet." Lingner, "Der Mensch als Organisationsvorbild," 24.

³²² These included the Lingner & Kraft Company (1888)/Lingner Company (1892), the Dresden Chemical Laboratory Lingner (1892)/Lingner Works (1897), the Central Disinfection Office (1905), a publishing house (*Deutschen Verlag für Volkswohlfahrt*, 1905), a soap factory (*Kavon-Werke*, 1905), and the Saxon Serum Works (1911). Lingner also founded a Center for Dental Hygiene (1900-1909), a Disinfection Facility (1901-1965), a reading hall (1902), a Statistics Bureau (1904), and the Political Science Archive in Berlin (1915). Lingner was a founding member of the Berlin-based Deutscher Verein für Volkshygiene (1899), and from 1897 until his death he was involved with the Child Clinic and Infant Home in the Johannstadt neighborhood of Dresden. The Zentralstelle

the leftist pathological anatomist Rudolf Virchow most famously had written of the cell-state analogy as a defense of participatory democracy, Lingner stated explicitly that his version of the cell-state resembled enlightened absolutism, or possibly a constitutional monarchy—here using political referents to describe an anatomical metaphor for a society! In his conservative mindset, because mismanagement rebounded to damage the leader most of all, a hierarchical system in which the many (organs, employees, citizens) supported the one (brain, boss, monarch) prevented the emergence of autocratic rulers and the execution of decisions that would prove suicidal to the organism, whether biological, social, or political.

“A staunch pragmatist” who was unperturbed that the hope of fame and riches sometimes lured academics out of their ivory towers and into the marketplace, where they transformed their theories into practice, Lingner applied his business sense and marketing acumen to the public health and hygiene exhibitions he designed. In 1903 he contributed the funds for a pavilion covering “Epidemic Diseases and their Control” (*Volkskrankheiten und ihre Bekämpfung*) at the first German Cities Expo, held in Dresden. Dr. Ludwig Lange, an employee at the Lingner Works, led the group that curated the displays the industrialist had acquired from around Germany and from the Pasteur Institute in Paris.³²³ So pleased was Lingner with the exhibition’s success that he instigated the 1911 International Hygiene Exhibition in Dresden, a World’s Fair of bacteriology, clothing and architectural hygiene, anatomy and physiology, and nutritional science set amid entertainment options such as a cinema, a dance hall, a wave pool, and two

für Hygiene served as a transition organization between the 1. IHA and the National Hygiene Museum. Ulf-Norbert Funke, *Karl August Lingner: Leben und Werk eines gemeinnützigen Großindustriellen* (Munich: GRIN-Verlag, 2007); *ibid.*, *Lingner-Archiv*, accessed 25 Oct. 2012, <http://lingner-archiv.jimdo.com/>; and on the Statistics Bureau Sybilla Nikolow, “Der statistische Blick auf Krankheit und Gesundheit: ‘Kurvenlandschaften’ in Gesundheitsausstellungen am Beginn des 20. Jahrhunderts in Deutschland,” in *Infographiken, Medien, Normalisierung. Zur Kartografie politisch-sozialer Landschaften*, ed. Ute Gerhardt, Jürgen Link, and Ernst Schulte-Holtey, vol. 1: Grundlagen des Normalismus, 223-241 (Heidelberg: Synchron, 2001), 227-229.

³²³ Karl August Linger, “Einige Leitgedanken zu der Sonderausstellung. Volkskrankheiten und ihre Bekämpfung,” in *Die deutschen Städte. Geschildert nach den Ergebnissen der ersten deutschen Städteausstellung zu Dresden 1903*, ed. Robert Wuttke, vol. 1, 531-547 (Leipzig: Friedrich Brandstetter, 1904).

carousels. Unlike “dull” trade exhibitions geared toward industry insiders, this expo was intended to entice laypeople to learn about the wonder that was the human body and what they needed to do (or buy) to protect, maintain, or enhance it. Lingner would sell the public both scientific ideas about health and personal hygiene products designed to meet those needs.

The telescopic body: the 1900s and 1910s

From the beginning, the proto-Hygiene Museum exhibitions were designed to showcase for experts the latest in science and engineering, and for the public a message of personal responsibility for both individual and collective health. After visiting the 1903 “Epidemic Diseases and their Control” exhibition, a physician writing in a Dresden newspaper about advances in epidemiology and bacteriology argued that “the feeling of individual responsibility to the community must also be awakened and strengthened at the sight, for instance, of the table that graphically displays the influence of vaccination in Germany since 1874 compared to the prevalence of smallpox in our neighbor Austria.”³²⁴ Another writer reported how “an official physician described in a lecture the destruction that tuberculosis causes in the organs of the individual patient and the social body (*den sozialen Körper*).”³²⁵ One group of individuals made up the German *Volkskörper* and another group the Austrian one. What happened to the many (vaccination for smallpox, infection with tuberculosis) affected the one, and statistics allowed for comparisons on the population level of one social body to another. Because these things mattered on the national level, individual Germans (and Austrians) should therefore allow themselves to be vaccinated and avoid contracting or spreading “the white plague.”

³²⁴ Dr. M. Cohn: “es muß aber auch das Gefühl der Verantwortlichkeit des Einzelnen gegenüber der Allgemeinheit geweckt und gestärkt werden beim Anblick z. B. der Tabelle, welche graphisch den Einfluß der Impfung in Deutschland seit 1874 gegenüber der Häufigkeit der Pocken in unserem Nachbarland Österreich darstellt.” “Epidemiology und Bakteriologie,” *Dresdner Anzeiger: Außerordentliche Beilage für die Deutsche Städteausstellung* [173], no. 12 (27 Aug. 1903): 46.

³²⁵ “Ein berufender Arzt schildert in einem Vortrage die Zerstörung, die von der Tuberkulose in den Organen des einzelnen Kranken und im sozialen Körper angerichtet werden.” Johannes Corvey, “Die Erziehung zur Hygiene,” *DA: Außerordentliche Beilage für die Deutsche Städteausstellung* [173], no. 12 (27 Aug. 1903): 45-46.

In addition to repeatedly connecting individual, physical bodies to the metaphorical social body, the exhibits also extended down to sub-individual levels, simultaneously reducing diseases that were epidemic on the population level to microorganisms that could be controlled in a laboratory and also enlarging them to objects that could be displayed in an exhibition. The most spectacular feature of the “Epidemic Diseases and their Control” pavilion was the central hall dedicated to bacteriology. At the entry, large wax models of bacteria greeted visitors with a macro-scale view of the contents of the culture bottles on loan from the Pasteur Institute. On the other end of the room, a three-meter-tall statue of Hercules wrestling with a Hydra presided over two long rows of microscopes under glass cases. Lingner had designed this display to remove the complicated laboratory work usually required to use a microscope, such that visitors could merely observe bacteria on slides that had been prepared beforehand. The microscopes were reputedly as popular as the simple, color-coded charts of statistics displayed among the anatomical preparations and tools of hygiene in the niches off both sides of the central room devoted to various infectious diseases. Over the course of four months almost a quarter-million curious onlookers streamed through the pavilion. “This success shows how fervent the interest of the population for hygiene instruction is,” wrote Lingner afterward, “and what fertile soil is available to the social hygienists.”³²⁶

Whether any of the laypersons understood what they saw through the oculars was less important to him than the rhetorical promise of the models and microscopes themselves, which stood as proof that bacteriologists could make the causes of disease visible and therefore combatable.³²⁷ Lingner explained, “It sufficed completely for present purposes if, after

³²⁶ “Dieser Erfolg zeigt, wie brennend das Interesse der Bevölkerung für hygienische Belehrung ist, und welch fruchtbarer Boden dem Sozialhygieniker zur Verfügung steht.” Linger, “Einige Leitgedanken zu der Sonderausstellung,” 547.

³²⁷ Christine Brecht and Sybilla Nikolow, “Displaying the Invisible: *Volkskrankheiten* on Exhibition in Imperial

contemplation of all the microscopes, the visitor took away nothing more than the belief in the fact that there are bacteria.”³²⁸ In other words, if seeing was believing—and if belief had any impact on behavior—then Lingner hoped the exhibition would stimulate someone with symptoms of tuberculosis to go to a scientifically trained doctor who could diagnose diseases caused by bacteria rather than to a “quack” who did not believe in germ theory. Further, this person should trust the public health authorities who sought municipal funds to clean the water supply, implemented quarantines, and ordered disinfections. In fact, city residents could participate in the combat by bringing bedding and other items to Lingner’s Disinfection Facility (est. July 1901). This was just one intermediate step that telescoped between seeing the tiny culprits with the aid of a microscope and population-level epidemiology. It suited their place on the continuum of bacteriological expertise.

The first International Hygiene Exhibition (1. IHA) strengthened the connections between laboratory science, individual disease, and collective health. Open from 6 May to 31 October 1911, the expo attracted an astonishing 5.5 million visitors to Dresden.³²⁹ Thirty countries were represented on its Avenue of Nations, including Japan, Brazil, Russia, and France—which was participating in a major German exhibition for the first time since the Franco-Prussian War forty years earlier—but none could out do host city Dresden. Most of the two dozen pavilions contained displays aimed at other specialists, but under Lingner’s

Germany,” *Stud. Hist. Phil. Biol. & Biomed. Sci.* 31, no. 4 (2000): 511-530. On the social and political ramifications of the ability to visualize see several chapters in Philipp Sarasin, Silvia Berger, Marianne Hänsler, and Myriam Spörri, eds. *Bakteriologie und Moderne: Studien zur Biopolitik des Unsichtbaren, 1870-1920* (Frankfurt am Main: Suhrkamp Verlag, 2007).

³²⁸ “Es genügte für den vorliegenden Zweck vollkommen, wenn der Besucher nach Beschauen aller Mikroskope nichts weiter profitierte als den Glauben an die Tatsache, daß es Bakterien gibt.” Lingner, “Einige Leitgedanken zu der Sonderausstellung,” 545.

³²⁹ This was an impressive turnout considering the IHA was not sanctioned by the Bureau of International Expositions. Six BIE World’s Fairs held about the same time averaged 9 million visitors over 4.5- to 7-month-long expos: Liege 1905, Milan 1906, Seattle 1909, Brussels 1910, Turin 1911, and Ghent 1913. Johanna Schrön, “Ein ‘grosses, lebendiges Lehrbuch der Hygiene’—Die Internationale Hygiene-Ausstellung in Dresden 1911,” in *Wissenspopularisierung: Konzepte der Wissensverbreitung im Wandel*, ed. Carsten Kretschmann, 309-322 (Berlin: Akademie, 2003), 309.

leadership, Dresden's planning committee had put together a two-part exhibit for the general public that was more accessible than the 1903 pavilion and therefore more popular. One part looked back at the history of hygiene, from the intuitive hygienic principles of valorized ancient cultures through the comparatively unhygienic medieval period to the re-awakening of hygiene in the nineteenth century; an ethnographic section completed the scholarly arc.³³⁰ The other part presented Lingner's *magnum opus*, the extremely popular installation "Man" (*Der Mensch*), which was simultaneously a natural wonder and a triumph of modern science. Both halves of Dresden's popular exhibition were intended to demonstrate that laypeople could access and enact the same celebrated advancements in hygiene that nourished (Western) culture and civilization.

The popular section in 1911 both literally and figuratively enlarged and expanded upon the display and themes of the 1903 exhibition. The rows of microscopes made another appearance, as did Hercules—this time as a sun-worshipper,³³¹ standing erect with his arms and face lifted upward "rejoicingly toward the sun, the Mother of All." Retired senior military physician Dr. Georg Ernst Schill (*1852) described the ten-meter-tall bronze statue that commanded the entrance to the building this way: "The otherwise completely empty hall produces the effect of a classical temple erected to the honor of Nature and her noblest product: man (*der Mensch*)."³³² The inscription on Hercules' pedestal read "No riches/ compare with you/ O Health."³³³ Far from a rejection of civilization, or an appeal for a return to nature, this "temple" succeeded in Schill's opinion because of the simplicity of the modern science it contained.

³³⁰ Claudia Stein, "Geschichte ausstellen: Die historische Abteilung und ethnologische Unterabteilung der Internationalen Hygiene Ausstellung in Dresden 1911?" (paper presented at Univ. Bielefeld, 15 Jan. 2013).

³³¹ R. B., "Lichtgebet" and "Gläserner Mann," in *Bilder und Zeugnisse der deutschen Geschichte: aus den Sammlungen des Deutschen Historischen Museums*, ed. Heidemarie Anderlik and Leonore Koschnick (Berlin: Deutsches Historisches Museum, 1997), 341, 402.

³³² Generalarzt a. D. Dr. Schill: "aufjauchzend zur Allmutter Sonne" and "Der im übrigen völlig leere Saal wirkt wie ein antiker Tempelraum, errichtet zu Ehren der Natur und ihres edelsten Produktes: des Menschen." "Die populäre Abteilung der Internationalen Hygiene-Ausstellung in Dresden," *DmW* 37:2, no. 33 (17 Aug. 1911): 1526.

³³³ Abb. 18, "Kolossal-Statue des Herakles im Pavillon 'Der Mensch' mit Sockelschrift: 'Kein Reichtum gleicht Dir O Gesundheit.'" In Klaus Vogel, *Das Deutsche Hygiene-Museum Dresden 1911-1990*, 28.

Der Mensch expanded upon the trend of making the body both visually and conceptually transparent that had begun with the 1903 infectious disease exhibition. To the microscopic pathogens, the unvaccinated individuals, and the social body displayed in 1903 were added many more vertical and horizontal layers of the telescopic body. Particularly innovative was the array of “Spalteholz preparations,” tissue specimens or whole organs preserved in such a way as to allow light to pass through them. Around 1906 Leipzig anatomist Werner Spalteholz (1861-1940) had perfected a complicated method of dehydration and plasticization to produce striking objects encased in glass, and now he was exhibiting his work to the general public for the first time.³³⁴ Of all the “wonderfully beautiful preparations” on display, Dr. Schill thought these deserved special mention.³³⁵ Current DHMD director Klaus Vogel explains,

These novel processes and models offered the layperson a means of understanding the interior of the human body. They were the antithesis of the anatomy room, which had a tendency to affect the senses more than the intellect. Free of bodily, sensual and transient emotions, these carefully designed models bore witness to a faith in the possibility of attaining a state of health and well-being.³³⁶

Just as Lingner had obviated the need for technical skills in using a microscope to visualize bacteria in that first pavilion, so Spalteholz’s preparations removed anatomy from the offensive space of the dissection laboratory to the sanitized and aestheticized space of the exhibit. This see-through man” (*durchsichtige Mensch*) display was supposed to make the science more aesthetically palatable and therefore accessible. Not all visitors left with impressions as lofty as Schill’s, as we will see.

Spalteholz’s translucent specimens were only the most spectacular of the skeletons, wax

³³⁴ Werner Spalteholz, “Ueber das Durchsichtigmachen von Praeparaten,” *BIAMM* No. 5 (1 June 1915): 41-44. His first medical audiences were at conferences in Wiesbaden and Würzburg in 1907. *Ibid.*, *Über das Durchsichtigmachen von Praeparaten*, 2. Aufl. (Leipzig: S. Hirzel, 1914), 7.

³³⁵ Schill, “Die populäre Abteilung,” 1527.

³³⁶ Klaus Vogel, “The Transparent Man—Some Comments on the History of a Symbol,” in *Manifesting Medicine: Bodies and Machines*, ed. Robert Bud, Bernard Finn, and Helmuth Trischler, 31-62 (Amsterdam: Harwood Academic, 1999), 38.

models, and other preparations that turned the body inside out in 1911. These objects and a variety of photographs and drawings peeled back the covering of the skin and made muscles, bones, nerves, and blood vessels available to the public. The curators wanted to make the strange familiar in order to ensure visitors absorbed the message that they, too, could master their bodies, just as medical science had. The exhibition's two-step goal was for viewers to grasp the wonder of the human body through its anatomy, physiology, and pathology; then they would adopt the prescribed actions, such as identifying adulterated foodstuffs, guarding against dust inhalation at work, and practicing regular oral hygiene for the good of their individual bodies.³³⁷

Dr. Schill, who had visited *Der Mensch* more than a dozen times, thought the organizers had done an excellent job with the presentation. "What should be emphasized and particularly commended are the clear descriptions of the objects on display that are understandable to every lay person, the various apparatuses on which concepts may be tried, and the effects derived from them," he wrote in an influential clinical journal.³³⁸ He had perceived that the creators of the exhibit emphatically wanted to make the impressive knowledge of the health sciences accessible to ordinary Germans, to render it comprehensible, and to replace spectators' unsophisticated notions about their bodies with a thoroughly modern belief in individual responsibility for health. In this way, the proto-German Hygiene Museum functioned as a three-dimensional textbook of hygiene, fascinating and instructing physicians and the general population alike.³³⁹

³³⁷ This was very like the popularizing goals of alternative medical practitioners since the 1880s, and although the 1. IHA taught visitors about sun, air, and water, too, Lingner made sure naturopathy was not mentioned. Cornelia Regin, "Zwischen Angriff und Abwehr: Die Naturheilmovement als medizinkritische Öffentlichkeit im Deutschen Kaiserreich," in *Medizinkritische Bewegungen im Deutschen Reich (c. 1870-c. 1933)*, ed. Martin Dinges, 39-58 (Stuttgart: Franz Steiner Verlag, 1996), 55-56.

³³⁸ "Was besonders lobend hervorzuheben ist, ist die klare, jedem Laien verständliche Bezeichnung der dargestellten Gegenstände, der bei den einzelnen Apparaten anzuwendenden Handgriffe und des durch sie hervorzuruffenden Effektes." Schill, "Die populäre Abteilung," 1527.

³³⁹ *Offizieller Katalog der Internationalen Hygiene Ausstellung Dresden Mai bis Oktober 1911*, neu verb. Aufl. (Berlin: Rudolf Mosse, 1911), 16; *Offizieller Führer durch die Internationale Hygiene-Ausstellung Dresden 1911 und durch Dresden und Umgebung* (Berlin: Rudolf Mosse, [1911]), 42-43; Schrön, "Ein 'grosses, lebendiges

Indeed, both the popular and scientific sections covered much of the same ground with respect to nutrition: nutrients and food safety. The guidebook assured readers that this large room in the hall for *Der Mensch* “will probably find the particular attention of every visitor. ... Everything that a man needs to know about his daily food is shown here in the most thorough manner.”³⁴⁰ Even though housewives knew a great deal from their daily practice, continued the guidebook, even they might learn something new in the part on cooking and canning. Meanwhile, numerous luminaries had donated to the scientific and industrial exhibits in Building 56. Biochemist Emil Abderhalden’s (1877-1950) horseshoe-shaped setup supposedly demonstrated the whole of plant and animal physiological chemistry.³⁴¹ Food chemist Joseph König (1843-1930) had sent displays on calories, metabolism, and respiration from the Agricultural Experiment Station in Münster. And from Braunschweig, food and drug chemist Heinrich August Beckurts (1855-1929) had donated canned vegetables prepared between 1891 and 1902 that were still edible!³⁴² There was also a full-service food chemistry laboratory and another from the Imperial Health Office for testing the purity and cleanliness of milk. All the space devoted to these displays suggests that nutrients and especially chemical or pathological contaminants were important not just for individual health but also for the national economy and well-being.

Just as the 1903 exhibition had traveled after the German Cities Expo closed in Dresden,

Lehrbuch der Hygiene.” Lingner first used the metaphor of a textbook in the 1903 exhibition: “Einige Leitgedanken zu der Sonderausstellung,” 540-541.

³⁴⁰ Die Gruppe Ernährung, “die wohl die besondere Beachtung jedes Besuchers finden wird. ... In der gründlichsten Weise ist hier alles gezeigt, was der Mensch über seine tägliche Nahrung wissen muss.” *Offizieller Führer*, 44. The catalog for the 1912 Darmstadt exhibition of parts of the popular section put it this way: “Of particular importance in the whole section on nutrition is that not just foods are being shown here but also their composition, so that their nutritional value is demonstrated in great detail.” *Ausstellung “Der Mensch.” Ausgewählte Gruppen aus der Internationalen Hygiene-Ausstellung Dresden 1911. Darmstadt im Grossherzoglichen Residenzschloss* (Dresden: Deutsches Hygiene-Museum Dresden Bücherei, 1912), 48.

³⁴¹ *Offizieller Katalog*, 285.

³⁴² Joseph König, Adolf Schmidt, and Emil Abderhalden, *Sonder-Kataloge der Gruppe Ernährungslehre der Internationalen Hygiene-Ausstellung Dresden 1911* (Dresden: Verlag der IHA, 1911), 42.

so too did the 1911 exhibits.³⁴³ This time Großherzog Ernst Ludwig von Hessen brought a selection of them to the industrial Rhineland city of Darmstadt in 1912 for a crowd of 230,000 visitors in five months. In preparation, the guidebook was edited to make the telescopic message even clearer, and it is worth quoting at length. This new paragraph was added at the beginning of the pamphlet:

Health is the greatest good. It constitutes the broadest basis of happiness not only for the individual but also for the whole family—yes, it even determines the economic prosperity of an entire nation. Tremendous amounts of strength and incalculable capital lie dormant in every great *Volkskörper*. To harness them and to make them usable for the public good is the highest moral duty of every citizen. Even though he may otherwise avoid any political activity, the individual can contribute his share to the prosperity of his own *Volk* by bestowing upon his body the attention and treatment that will enable it to achieve its full strength and potential; for the increase in strength of each individual naturally if indirectly benefits the entire nation.³⁴⁴

By 1912 already, personal hygiene for the good of the *Volkskörper* could be described as an explicitly political action. The imperial capital of Berlin may have been the seat of national politics, but in a federated nation-state like the German Empire, individuals had many outlets for political expression and participation, especially in local or state affairs.³⁴⁵ A telescopic perspective multiplied the number of political acts from voting, speechifying, and publishing to

³⁴³ Georg Seiring, “Lingner und sein Werk ‘Das Deutsche Hygiene-Museum,’” *Hygiene* 22, no. 5A (May 1930): 267-278, here 269. It went to Frankfurt am Main (1904), Munich (1905), and Kiel (1906).

³⁴⁴ I have taken the liberty of normalizing punctuation and capitalization to make grammatical statements out the three run-on sentences in the original: “Gesundheit ist das höchste Gut. Sie bildet nicht nur die breiteste Grundlage des Glücks des einzelnen Menschen, sondern auch der ganzen Familie, ja, sie bedingt den wirtschaftlichen Wohlstand einer gesamten Nation. Ungeheuer Werte an Kraft und unermeßlichem Kapital schlummern in jedem großen Volkskörper, sie zu bergen und dem Wohle der Allgemeinheit nutzbar zu machen, ist höchste sittliche Pflicht jedes Staatsbürgers. Der einzelne kann selbst, mag er sich auch sonst noch so sehr von einer politischen Betätigung fernhalten, das Seinige zum Gedeihen des eigenen Volkes beitragen, wenn er seinem Körper die Aufmerksamkeit und die Behandlung zuteil werden läßt, die ihn zur höchsten Leistungsfähigkeit und Ausnutzung der Kräfte befähigt; denn die Erhöhung des Kraftbestandes des einzelnen Individuums kommt naturgemäß mittelbar der ganzen Nation zugute.” *Ausstellung “Der Mensch” ... Darmstadt*, 19.

³⁴⁵ Robin Judd, *Contested Rituals: Circumcision, Kosher Butchering, and Jewish Political Life in Germany, 1843-1933* (Ithaca: Cornell University Press, 2007); Laura Wildenthal, *German Women for Empire, 1844-1945* (Durham: Duke University Press, 2001); Margaret Lavinia Anderson, *Practicing Democracy: Elections and Political Culture in Imperial Germany* (Princeton, NJ: Princeton University Press, 2000); Larry Jones and James N. Retallack, eds. *Elections, Mass Politics, and Social Change in Modern Germany* (Washington, DC: German Historical Institute, 1992); Stanley Suval, *Electoral Politics in Wilhelmine Germany* (Chapel Hill: University of North Carolina Press, 1985); David Blackbourn and Geoff Eley, *The Peculiarities of German History: Bourgeois Society and Politics in Nineteenth-Century Germany* (New York: Oxford University Press, 1984).

include physical exercise and eating habits. The influence of these actions then diffused throughout the population. Even if “he” joined no party, social group, or professional organization, a German could contribute to the strength of the entire nation by cultivating his body. It was not enough to believe in bacteria or vitamins; one had to perform certain actions and not perform others in order to avoid sickness and improve health, not just for oneself but for one’s Volk. The increase in individual strength that “naturally if indirectly benefits the entire nation” is another example of the telescopic body’s commutative property of health.

Thus by the time Lingner and colleagues incorporated the National Hygiene Museum in 1912, they had set a precedent of connecting basic science to individual health and national strength and success. This pattern continued during and after the war with temporary and traveling exhibitions about care of the wounded or crippled, infant health, and venereal disease.³⁴⁶ Even Lingner’s untimely death in 1916 from complications after surgery for tongue cancer could not stop them but rather provided a rallying cry for Lingner’s many co-workers, such as medical historian Dr. Karl Sudhoff (1853-1938), bacteriologist Dr. Friedrich Woithe (1878-1923), and ophthalmologist and anti-quackery crusader Dr. Otto Neustätter (1870-1941).³⁴⁷ While the war had slowed their progress toward constructing and outfitting a permanent museum building, the hyperinflation changed their focus somewhat: selling duplicates of objects in their collection would raise funds from outside Germany while raising the profile of the beleaguered country.³⁴⁸

Nutrition under the hygiene eye: the 1920s and 1930s

³⁴⁶ E.g. “Die Ausstellung der Deutschen Gesellschaft zur Bekämpfung der Geschlechtskrankheiten,” *Dresdner Hausfrau* 15, no. 10 (16 Dec. 1916): 15-16.

³⁴⁷ Deutsches Hygiene-Museum Dresden, *Das National-Hygiene-Museum in Dresden in den Jahren 1912-1918* (Dresden: C.C. Minhold & Söhne, 1919), esp. 5-8.

³⁴⁸ DHMD, *Das National-Hygiene-Museum*; Nr. 54 “Das Deutsche Hygiene-Museum und seine Bedeutung für die Volksgesundheit” (1920), 11.3.13686 Deutsches Hygienemuseum e.V. (1908-1946), SHAD.

As in the clinic, so in the exhibition: patients and visitors were cast as ignorant recipients of nutritional knowledge who, once properly enlightened about what and how to eat, should go and do likewise. Over the 1910s and 1920s, the museum had acquired a collection of workshops to turn out plaster and wax models of brain development, posters depicting behaviors that transmitted tuberculosis, and lectures about pregnancy and childbirth accompanied by glass lantern slides.³⁴⁹ In the postwar period, a number of these collections dealt with the all-important topic of nutrition and digestion.³⁵⁰ For instance, the promotional material for the teaching collection on nutrition claimed that such education was necessary for community schools, girls' and housekeeping schools, and high schools because modernization and urbanization had removed Germans from the land. Not only did they no longer eat a simple, wholesome diet based on "instinct," but information about nutritional physiology was not widespread enough for them to rationally and healthfully shop and cook in their new, urban environment.³⁵¹

In other words, Martin Vogel (1887-1947) and the other designers imagined their audience as doubly ignorant about how they should feed themselves and their families: they possessed neither internal (instinctual) nor external (scientific) knowledge. Thus, one lecture concluded with a homey drawing by the famous Romantic painter and Saxon native son Ludwig Richter (1803-1884) and the warning that "Just as individual nutrition is at the center of personal

³⁴⁹ Dr. Egon Erich Albrecht, *Das Deutsche Hygiene-Museum und sein Internationaler Gesundheitsdienst. Eine Denkschrift* (Dresden: [DHMD], 1931), 20, 48, 60. A shorter history of the museum is Georg Seiring, "Das Deutsche Hygiene-Museum," in *Internationale Hygiene-Ausstellung Dresden. Amtlicher Führer* (Dresden: Verlag der Internationalen Hygiene-Ausstellung, 1930), 24-31 [hereafter *Amtlicher Führer*]. For specific examples see "Gehirnentwicklung" (1920s-1930s), DHMD 1922/87.1-14; "Wie die Tuberkulose übertragen wird," Tafel 2, Unterrichtssammlung über Tuberkulose (1920s), DHMD 1995/37; Vortrag 21 "Schwangerschaft, Geburt und Wochenbett" (c. 1923), DHMD 2002/161 or 2002/205. Items designated DHMD Year/# can almost always be found in the Online Objekten-Datenbank: <http://www.dhmd.de/emuseum/eMuseumPlus>.

³⁵⁰ Lichtbildreihe 6 "Verdauungsorgane" (c. 1923), Lichtbildreihe 35 "Die Ernährung des Menschen" (c. 1924), a teaching collection on nutrition (1920s), Lichtbildreihe 106 "Verdauungsorgane" (c. 1933), and the DHMD's contributions to the IHA 1911, GeSoLei (Düsseldorf, 1926), the large "Ernährung" exhibition (Berlin, 1928) and the related traveling exhibition "Richtige Ernährung" (1928-1929), the IHA 1930/1931, and of course the museum's permanent display collection. DHMD Museum und Archiv, Dresden.

³⁵¹ P. 2 of *Kurze Erläuterungen zur Unterrichtssammlung über Ernährung* (Dresden: Aktiengesellschaft für hygienische Lehrbedarf, [1920s]), DHMD 2002/808, DHMD Archiv, Dresden.

health care, so feeding the nation (*Volksernährung*) also assumes a highly important position in the life of the whole people.”³⁵² These materials were directed not only to schoolchildren but to adults, too. Choirs, sports teams, and social or charitable organizations could rent a projector, lantern slides, and lecture outline for an evening discussion. No one was unconnected to the food question, so until they could go to the museum in a permanent building, it would come to them.

The scientific knowledge the museum offered them was telescopic. Learners confronted this thinking, for instance, in the images about nutrition and digestion. In Lecture 35 on “Human Nutrition,” slide 16 juxtaposes three magnifications of the wall of the stomach, encouraging associations between higher and lower levels (see page 134).³⁵³ Slide 33 of Lecture 6 on “The Digestive Organs” also uses a rectangle to frame an area of small intestine on the left half of the slide that is magnified on the right half and indicated by an arrow.³⁵⁴ These anatomical and histological details complicated the assumption that once food was eaten, it was inside the body and therefore part of it. Rather than a simple inside/outside binary organized around the border of the skin and lips, the telescopic body with its many layers had multiple insides: the gastrointestinal tract, the blood stream, the organs, and their cells.

The telescopic body had multiple “outsides,” too, from the family, to the community, to the nation. Other lessons made connections between the health of individuals and of these groups. One chided that eating too much strained not only an individual’s anatomical and

³⁵² “So wie die Ernährung des Einzelnen im Mittelpunkt der persönlichen Gesundheitspflege steht, so nimmt auch die Volksernährung eine höchst wichtige Stellung im ganzen Volksleben ein.” DHMD, *Vortrag 35: Die Ernährung des Menschen* (Dresden: Aktientgesellschaft für hygienischen Lehrbedarf, [c. 1924]), DHMD 2002/744, 25; this references Bild 65 “Zum Essen, zum Essen!,” Lichtbildreihe 35 “Die Ernährung des Menschen,” DHMD 2002/1252.

³⁵³ Bild 16 “Der Bau der Magenschleimhaut,” Lichtbildreihe 35, “Die Ernährung des Menschen,” DHMD 2002/1203; same as Bild 26 in Lichtbildreihe 6 “Verdauungsorgane,” DHMD 1999/818.

³⁵⁴ Bild 33 “Ausschnitt aus der Wand des Dünndarms mit ihren Lymphgefäßen bei stärkster Vergrößerung,” Lichtbildreihe 6 “Verdauungsorgane,” DHMD 1999/825.

digestive capabilities but also the nation's scarce food resources.³⁵⁵ The notion that the stomach and intestines needed periods of rest from their involuntary movements just like skeletal muscles did from their voluntary movements can be traced back to nineteenth-century medical books,³⁵⁶ but the idea that an overeating individual literally took food from the mouth of another German was a holdover from the rationing of the recent war.³⁵⁷ Not only overeaters but also those who chose less healthy foods or prepared healthy foods improperly were held responsible for Germans' collective health: "A diet that exclusively or almost exclusively consists of white wheat bread, meat, fish, and boiled vegetables—as one encounters especially in restaurants, however unfortunately also more and more in the homes of many social classes, not least factory workers in large cities—revenge itself on human health."³⁵⁸ This was the modern, urban diet that worried nutrition reformers like Vogel, whose ideas about how to fix it included meals like that at the start of the chapter, with whole grains, less meat, raw fruit, and steamed vegetables.³⁵⁹

To increase the publicity around the opening of a new and permanent building almost two decades after the successful 1911 exhibition that had launched the German Hygiene Museum, Museum Director Georg Seiring (1883-1972) proposed that the museum work with the Annual Show of German Work (*Jahresschau Deutscher Arbeit*) to stage a second International Hygiene

³⁵⁵ From the introduction to DHMD, *Vortrag 35*, 3. This point was illustrated in the lectures by a slide graphing the meager general population wartime rations (in calories/day) in Frankfurt am Main and another slide juxtaposing the mortality rate at the Landesanstalt Colditz in Saxony with (male) inmates' body weight. Bild 7 "Kalorienwerte der vom Städt. Lebensmittelamt Frankfurt a.M. verausgabten Nahrungsmittel (Tagesportionen 1915/1919)," Lichtbildreihe 35 "Die Ernährung des Menschen," DHM 2002/1194; and Bild 8 "Gang des Körpergewichts und Sterblichkeit der männlichen Anstaltsinsassen in der Landesanstalt Colditz 1915/1923 (Nach Dehio)," Lichtbildreihe 35 "Die Ernährung des Menschen," DHMD 2002/1195.

³⁵⁶ E.g. Otto Dornblüth, *Diätetisches Kochbuch*, 2. Aufl. (Würzburg: A. Stubers & Curt Kabitzsch, 1905), 139.

³⁵⁷ Soon enough overeating would be decoupled from the national economy in the growing trend toward dieting: Sabine Merta, *Wege und Irrwege zum modernen Schlankheitskult. Diätkost und Körperkultur als Suche nach neuen Lebensstilsformen 1880-1930* (Stuttgart: Franz Steiner Verlag, 2003).

³⁵⁸ "Eine Ernährung, die ausschließlich oder vorwiegend aus weißem Weizenbrot, Fleisch, Fisch und abgebrühtem Gemüse besteht, wie man besonders bei der Gasthauskost, leider aber auch mehr und mehr bei der häuslichen Kost weiter Volksschichten, nicht zuletzt der großstädtischen Industriearbeiterschaft antrifft, rächt ich ganz sicher an der Gesundheit der Menschen." DHMD, *Vortrag 35*, 23. This was in reference to Bild 59 "Der Verlust an Nährstoffen beim Mahlen des Getreides: 2. Weizen," Lichtbildreihe 35 "Die Ernährung des Menschen," DHMD 2002/1246.

³⁵⁹ Martin Vogel, *Ernährungsführer* (Dresden: Deutscher Verlag für Volkswohlfahrt, 1928). See also Chapter 3.

Exhibition (2. IHA) in 1930.³⁶⁰ The Jahresschau had been hosting expos in Dresden since 1922, so despite the economic depression, the IHA could be nearly self-financed, with a combined 790,000 RM coming from the city, state, and national governments.³⁶¹ To differentiate it from the much-publicized GeSoLei exhibition in Düsseldorf in 1926, which had showcased health (*Gesundheit*), social welfare (*soziale Fürsorge*), and physical fitness (*Leibesübungen*), the 2. IHA was originally planned to focus narrowly on personal hygiene and exercise.³⁶² However, the scope of the event eventually grew to include all facets of individual and collective health, including nutrition.

More than in 1911, the various authorities involved with the 2. IHA promoted it with the language of the health of the people (*Volksgesundheit*), the national economy (*Volkswirtschaft*), and the social body (*Volkskörper*). Even before the National Socialist take-over in 1933, the late Weimar Period was marked by organicist collectivism. Thus, the 2. IHA's mottos were "Health is the highest possession of man and the greatest good of the peoples (*Völker*)" and "Health means life-long happiness for the individual, strength and power for the people (*Volk*)!"³⁶³ Dr. Wäder at the Saxon State Health Office in Dresden explained in a hygiene journal that the need

³⁶⁰ For the exhibition's papers see Nr. 592 & 593 Internationale Hygiene-Ausstellung Dresden 1930 Bd. 1 & 2 (1930), 11168 MfW, SHAD; Nr. 595 Internationale Hygiene-Ausstellung 1931 im Rahmen der Jahresschau Deutscher Arbeit (1930-1931), 11168 MfW, SHAD; and Nr. 105 Jahresschau Deutscher Arbeit 1922-1928, Bestand 17.2.1 Drucksammlung Gruppe A, Stadtarchiv Dresden. For details about the Saxon state displays, see Nr. 594 Ausstellungen des Sächsischen Staates auf den Internationalen Hygiene-Ausstellung Dresden 1930 (1929-1931), 11168 MfW, SHAD; and Nr. 115 Musterhof Tagebuch, 13686 Deutsches Hygiene-Museum e.V., SHAD.

³⁶¹ Georg Seiring and Marta Fraenkel, eds., *10 Jahre Dresdner Ausstellungsarbeit: Jahresschauen deutscher Arbeit 1922-1929 und Internationale Hygiene-Ausstellung 1930/31* (Dresden: Verlag der IHA 1930/31, 1931); and the *Amtlicher Führer*, 8 vols. (Dresden: Verlag der Jahresschau Deutscher Arbeit, 1922-1929). Each year's exhibition had a different theme: German Earthen Materials: Porcelain, Ceramic, Glass (1922), Play and Sport (1923), Travel and Fashion (1924), Housing and Settlement (1925), Gardening (1926), Paper (1927), The Technical City (1928), Traveling and Hiking (1929), International Hygiene Exhibition (1930, 1931).

³⁶² Deutsches Hygiene-Museum Dresden and Jahresschau deutscher Arbeit, *Hygiene Ausstellung Dresden 1930* (Dresden: Verlag der IHA 1930, [1929]), 9 [hereafter *Prospekt*]. The DHMD sent Martin Vogel and some displays to GeSoLei but was not involved in planning that event.

³⁶³ "Gesundheit ist der höchste Besitz des Menschen und das größte Gut der Völker" and "Gesundheit bedeutet Lebensglück für den Einzelnen, Kraft und Macht für das Volk!" As quoted in Dr. Wilhelm Külz, "Der Menschheitsgedanke der Internationalen Hygiene-Ausstellung," in *Amtlicher Führer*, 9.

for such an exhibition was self-evident and that “effective protection is only possible when one openly demonstrates the dangers to the social body (*Volkskörper*) and informs about the means to combat them.”³⁶⁴ And Karl Süpfle (1880-1942), a scientific advisor on the planning committee, wrote of the close relationship between health and the economy: “Without the economy, health is impossible and vice versa, without health no economy. Apart from its severe immediate importance for individual, family and nation (*Volk*), each disease has the indirect effect of serious economic consequences.”³⁶⁵ He feared that if the birthrate remained as low as it was, the German Volk had already taken the first step toward becoming a dying people. So the nation was a body that could be strengthened, could become sick, and could die.

There was an understanding that health worked the same way in other nations, too. Wrote Erich Klien (1881-1940), the Minister of Economics for Saxony and State Commissioner of the 2. IHA, “Hygiene is service to the people. Without hygiene, no culture, no healthy state. Hygiene lengthens life, makes it more comfortable, [and] increases the number of people.... May rich blessings flow from [the IHA] to all levels of the German people and for all of humanity.”³⁶⁶ Not just Germany but all civilized peoples needed to follow the laws of hygiene to survive and thrive. With the exhibitions and museum, Germany in general and Dresden in particular were held up as pioneers in the science of hygiene and models for its popularization for other countries.³⁶⁷ Reich

³⁶⁴ “Ein wirksamer Schutz ist aber nur möglich, wenn man die Gefahren, die dem Volkskörper drohen, offen zeigt und über die Mittel zu ihrer Bekämpfung aufklärt.” Dr. med. Wäder, “Ergebnisse. 35. Internationale Hygiene-Ausstellung Dresden 1930,” *Zentrallblatt für die gesamte Hygiene mit Einschluß der Bakteriologie und Immunitätslehre* 22, no. 13 (1930): 793-801.

³⁶⁵ “Ohne Wirtschaft ist keine Gesundheit möglich und umgekehrt ohne Gesundheit keine Wirtschaft. Jede Erkrankung hat, abgesehen von ihrer schwerwiegenden unmittelbaren Bedeutung für Individuum, Familie und Volk, mittelbar die Wirkung erheblicher wirtschaftlicher Folgen.” Prof. Dr. Karl Süpfle, “Wesen und Ziel der Internationalen Hygiene-Ausstellung,” in *Amtlicher Führer*, 35.

³⁶⁶ “Hygiene ist Dienst am Volke. Ohne Hygiene keine Kultur, kein gesunder Staat. Hygiene verlängert das Leben, macht es angenehmer, erhöht die Zahl der Menschen.... Möchte reicher Segen von ihr ausgehen für alle Schichten des deutschen Volkes und für die ganze Menschheit.” “Dienst am Volke,” in *Amtlicher Führer*, 12.

³⁶⁷ E.g. Martin Vogel, “Aus der Wissenschaftlichen Werkstatt des Deutschen Hygiene-Museums,” in *Amtlicher Führer*, 94-99; p. 20 in the brochure *Internationale Hygiene Ausstellung Dresden Mai-Oktober 1930*, doc. 100, Nr. 594 Ausstellungen des Sächsischen Staates auf den IHA 1930, 11168 MfW, SHAD.

Minister of the Interior and Commissioner for the 2. IHA Wilhelm Külz (1875-1948) borrowed a phrase from Lingner to describe the event: “With the International Health Exhibition, a large textbook of popularized public health lies open before the entire world.”³⁶⁸

After the new democracy was handed a disgraceful treaty at Versailles, Germans of all political stripes sought to restore their dignity and the country’s reputation as a player on the world stage. There were practical considerations as well: while governmental and private museum members gave less money and the hyperinflation made staging traveling exhibitions unwieldy, foreign contracts for reproductions brought in steady income.³⁶⁹ For all these reasons, Georg Seiring wanted to develop the DHMD as a center not just of German but of international hygiene education and consultation. Of the Teaching Materials Department (*Lehrmittel-Abteilung*) he wrote, with no apparent irony, “In addition to orders from the domestic market there finally came some from abroad, and today we can say that the teaching resources of the German Hygiene Museum have already conquered the world.”³⁷⁰ “A sample from the triumphal march of the museum’s [traveling exhibitions]” included cities from Amsterdam to Budapest and from Rome to Riga. The Teaching Materials Department had sold posters and models to many

³⁶⁸ “Vor der ganzen Welt liegt mit der Internationalen Hygiene-Ausstellung ein großes, volkstümliches Lehrbuch der Volksgesundheitspflege aufgeschlagen da.” “Der Menschheitsgedanke der Internationalen Hygiene-Ausstellung,” in *Amtlicher Führer*, 11. Prof. Dr. M. Taute, Ministerialrat im Reichsministerium des Innern used similar language to describe the mixed state and national exhibit “The Development of German Public Health” as “a social hygiene textbook written upon the walls” of the exhibition halls. From “Die Beteiligung der Reichsregierung an der Internationalen Hygiene-Ausstellung Dresden 1930,” in *Amtlicher Führer*, 40-41. Interestingly, the head of that exhibit rejected the textbook concept, having chosen a unified, linear chronology in a timeline rather than a spatial organization by subject. Prof. Dr. Rott, “Ausstellung der Reichsregierung. Die Entwicklung des Deutschen Gesundheitswesens. Kulturhistorische Schau über hundert Jahre,” in *Amtlicher Führer*, 326-329.

³⁶⁹ Nr. 4 “Die Tätigkeit des Deutschen Hygiene-Museums 1918-1925,” 11.3.13686 Deutsches Hygienemuseum e.V. (1908-1946), SHAD; pp. 36-37 in *Das Deutsche Hygiene-Museum im Jahre 1933*, DHMD Bibliothek Hyg. A III 13/490, 33; Thomas Steller, “The Public Body: Collections and Exhibitions of the German Hygiene Museum in Europe in the 1920s” (paper presented at the Public Hygiene in Central and Eastern Europe, 1800-1940 conference at Univ. Gießen, 13-14 Jan. 2012).

³⁷⁰ “Zu den Aufträgen aus dem Inland kamen schließlich auch solche vom Ausland und heute, kann man sagen, haben sich die Lehrmittel des Deutschen Hygiene-Museums bereits die ganze Welt erobert.” Seiring, “Lingner und sein Werk,” 270.

more places even farther afield: Egypt, Cuba, Australia, and Japan.³⁷¹ Finally, in 1930 Seiring created an International Health Service (*Internationaler Gesundheitsdienst*) to coordinate these efforts.³⁷² The business director was also fond of repeating what Deutsches Museum founder Oskar Miller had said at the cornerstone laying for the DHMD building: “For the health [or salvation] of the city, the country, the world!”³⁷³

Visitors to the 2. International Hygiene Exhibition and the German Hygiene Museum in Dresden could find nutrition presented in both. Four of the museum’s twenty-one exhibit rooms contained the popular exhibition on nutrition, which borrowed heavily from what Vogel had developed for the “Nutrition” (*Die Ernährung*) expo in Berlin in 1928.³⁷⁴ The Imperial Health Office put together the scientific exhibition for doctors, hygienists, and teachers on what a healthy (*vollwertig*) diet was and how to prepare it.³⁷⁵ From published documents and what photographic records remain of the museum’s showrooms, we find that the messages the museum and the scientific section of the 2. IHA presented were largely but not completely compatible. Both analyzed common foodstuffs in terms of their nutrients and encouraged Germans to eat a balanced diet containing both plant and animal products, in order to consume

³⁷¹ The quotation about “eine Ausschnitt aus dem Siegeszug der Museumstätigkeit” comes from Albrecht, *Das Deutsche Hygiene-Museum* (1931), 57, but it is embedded in a list with much the same text that Seiring used in 1930 in “Lingner und sein Werk,” 271-272. Some purchasers were starting new museums, but many were already members of the International Association of Medical Museums. See *BIAMM* no. 1 (15 May 1907).

³⁷² Georg Seiring, *The Central Institution for Public Hygiene* (Dresden: Deutsches Hygiene-Museum, 1928); *ibid.*, *Das Zentralinstitut für Volksgesundheitspflege* (Dresden: Deutsches Hygiene-Museum, 1927). After leading the scientific section of the IHA, Dr. med. Marta Fraenkel (1896-1976) headed the Internationale Gesundheitsdienst until she was deprived of her post in 1933 on account of her Jewish background. She immigrated to Brussels in 1935 and then to New York in 1938.

³⁷³ “Der Stadt, dem Lande, der Welt zum Heil!” As quoted at the end of Seiring, “Lingner und sein Werk,” 274. Such internationalism was common among scientific and medical educators: “The sanitary housekeeping of any one nation concerns the sanitary housekeeping of the whole world, and the questions of public health and the education of laymen to an intelligent comprehension of such constitute an international problem,” declared Dr. Aldred Scott Warthin, “The Ideals and Functions of the International Association of Medical Museums. President’s Address. XVII International Congress of Medicine, London, August 1913,” *BIAMM* No. 5 (1 June 1915): 18-24, here 24.

³⁷⁴ Room 6: Principles of Nutrition, Room 7: Digestion and Elimination, Room 8: Nutrients and Food, Room 9: Vitamin and Nutritional Hygiene. *Museums-Führer*, 27-29; on the interior setup, Sabine Schulte, “Das Deutsche Hygiene-Museum in Dresden von Wilhelm Kreis: Biographie eines Museums der Weimarer Republik” (diss., Rheinischen Friedrich-Wilhelms-Univ. Bonn, 2001).

³⁷⁵ Dr. B. Pfyl, “Lebensmittel,” in *Amtlicher Führer*, 273-274.

enough protein and vitamins but not too many calories. Whereas the popular section also covered the anatomy and physiology of digestion, the scientific section included a discussion of foods that were “forbidden” because they had spoiled, were adulterated, or had been misleadingly labeled.³⁷⁶ The book of tips for the public that the Imperial Health Office published in conjunction with the exhibition doubted that vegetarian or raw-food diets were either economically or physically healthy for the nation. And the museum revealed the influence of Vogel’s nutrition reform principles, notably in the display promoting benefits from minerals in steamed rather than boiled vegetables (see Chapter 3).³⁷⁷

Exhibits as spaces of hygiene popularization

Vogel and the Museum sought to be on the cutting edge not just of scientific knowledge but of public hygiene education, for which they found themselves particularly qualified. “One has used and tested a variety of methods: the spoken word, the written word, visual, three-dimensional representations, performances on stage, offerings in the cinema, etc.,” wrote Süpfle upon the opening of the 2. IHA, but “the most impressive and most sustainable media remain museums and exhibitions.”³⁷⁸ Like their contemporaries at other institutions, the organizers connected with the German Hygiene Museum put a premium on visual education, primarily through two- and three-dimensional displays. Although the DHMD also employed spoken words (in lectures, guided tours, classes, and on the radio) and written words (in books, journals, and pamphlets), its staff maintained that “the image, or put another way, visual perception, is the

³⁷⁶ Jutta Grüne, *Anfänge staatlicher Lebensmittelüberwachung in Deutschland: der “Vater der Lebensmittelchemie” Joseph König (1843-1930)* (Stuttgart: Franz Steiner, 1994); Vera Hierholzer, *Nahrung nach Norm: Regulierung von Nahrungsmittelqualität in der Industrialisierung 1871-1914* (Göttingen: Vandenhoeck & Ruprecht, 2010).

³⁷⁷ Martin Vogel, “Gegenwartsfragen der Volksernährung,” *Hygiene* 22, no. 5A (May 1930): 301-304.

³⁷⁸ “Man hat die verschiedensten Mittel herangezogen und erprobt: das gesprochene, das geschriebene Wort, bildliche, plastische Darstellungen, Aufführungen auf der Bühne, Darbietungen im Kino usw. Wohl die eindrucksvollsten und nachhaltigsten Mittel sind und bleiben aber Museen und Ausstellungen.” Süpfle, “Wesen und Ziel der Internationalen Hygiene-Ausstellung,” in *Amtlicher Führer*, 34.

most important aid in the fight for better health.”³⁷⁹ Pictures and objects would make deeper and longer-lasting impressions than text. Explained Lingner in 1904, “Anyone who teaches knows that it is difficult and cumbersome for a simple brain to accommodate the written or spoken word without concomitant support from an illustration of some kind.”³⁸⁰ Assistant Science Director Dr. Bruno Gebhard (1899-1985) later agreed, “I am convinced that with laymen especially, seeing has a more lasting impact than listening or reading”—even though reading is a visual activity just as much as looking at images or objects.³⁸¹ He applied this principle to exhibitions he designed in Dresden, Berlin, and—after his emigration in 1937—Cleveland, Ohio.³⁸²

Hygiene educators did not consider all visuals equally effective, however. Photographs were striking but limited by their individuality and concreteness; in their stead, drawn or painted illustrations could teach universals or abstract ideas.³⁸³ There was also the matter of conveying color. Although the average person might perceive graphs as “dry” because he or she had not learned how to read them in school, some relationships could be better depicted in graphs than in text. “It is quite possible through curves, arrows and simple columns to represent temporal processes in space in a way that will be commonly understood,” affirmed artist Ernst Krantz (1889-1954), who worked with the scientific section.³⁸⁴ Three-dimensional objects provided

³⁷⁹ “Hier sind sie zunächst einmal auf das Bild verwiesen, denn das Bild im weitesten Sinne, oder anders gesprochen, die Anschauung, ist die wichtigste Hilfe im Kampf um einen bessere Gesundheit.” Albrecht, *Sein Internationaler Gesundheitsdienst*, 76.

³⁸⁰ “Wer lehrt, weiß, daß es für ein einfaches Gehirn schon an und für sich schwierig und mühsam ist, das geschriebene oder gesprochene Wort ohne gleichzeitige Unterstützung durch Veranschaulichung irgend welcher Art in sich aufzunehmen.” Lingner, “Einige Leitgedanken zu der Sonderausstellung [1903],” 535. See also J. Corvey, “Die Erziehung zur Hygiene.”

³⁸¹ W. J. T. Mitchell, *Picture Theory: Essays on Verbal and Visual Representation* (Chicago: University of Chicago Press, 1994); Paul Jay, “Picture This: Literary Theory and the Study of Visual Culture” (address delivered at La Sapienza, Rome, Italy, March 2000), accessed 20 March 2007, <http://home.comcast.net/~jay.paul/jay.htm>.

³⁸² “Ich bin davon überzeugt, daß gerade beim Laien das Sehen nachhaltiger wirkt als das Hören oder Lesen.” Bruno Gebhard, *Im Strom und Gegenstrom, 1919-1937* (Wiesbaden: Franz Steiner, 1976), 96.

³⁸³ Ernst Krantz, “Ausstellungskunst,” in *Amtlicher Führer*, 100-103.

³⁸⁴ “Selbst schwer vorstellbare Zusammenhänge lassen sich durch graphische Mittel leicht faßbar machen, und hierauf beruht zu einem erheblichen Teil der pädagogische Mehrwert der modernen Ausstellung gegenüber dem gedruckten Wort überhaupt.” Krantz, “Ausstellungskunst,” 102; see also Vogel, “Wie veranstaltet man hygienische

depth perception and visual interest in a room, while mechanical apparatuses offered dynamic displays or an interactive experience.³⁸⁵

And then there were films. As a series of still images, a film captured life-like forms and movements, if at first neither color nor sound. A statistical bureau had been set up to advise exhibitors for the IHA 1911 about both their booths and the production of short films, and in the aftermath of World War I, the National Hygiene Museum produced a number of educational shorts directed toward disabled veterans and their care-givers.³⁸⁶ Into the 1920s speakers employed both lantern slides and hygiene films (silent until at least 1929) as illustrations for live lectures.³⁸⁷ Unfortunately, films' early novelty wore off, and producers labored to find a middle ground between jargon-ridden educational recordings, tawdry popular flicks that used "medicine" as an excuse to depict taboo topics like drug-use and sex, and anatomical images that were too gross or frightening to be educational. Government censorship banned the most sensationalist productions after 1920,³⁸⁸ while institutional and market pressures encouraged hygiene filmmakers to adopt humor, pathos, narrative arcs, and cartoon technology in an effort to make their offerings simultaneously more interesting and more effective. Nevertheless, scholar

Ausstellungen?," *Hyg. Weg.* 1, no. 1 (1926): 10-12; and p. 6 of *Kurze Erläuterungen zur Unterrichtssammlung über Ernährung* (Dresden: Aktiengesellschaft für hygienischen Lehrbedarf, um 1925), DHMD 2002/808.

³⁸⁵ Krantz singles out the Deutsche Museum in Munich and the Düsseldorfer Reichsmuseum für Gesellschafts- und Wirtschaftskunde for having made displays of abstract concepts with electric buttons, levers, and cranks. "Ausstellungskunst," 103.

³⁸⁶ Ulf Schmidt, "Sozialhygienische Filme & Propaganda in der Weimarer Republik," in *Gesundheitskommunikation*, ed. Dietmar Jazbinsek, 53-81 (Wiesbaden: Westdeutscher Verlag, 2000), see 61n13 for a list. Philipp Osten analyzes an unrelated film called *Krüppelnot und Krüppelhilfe* in "Emotion, Medizin und Volksbelehrung: die Entstehung des 'deutschen Kulturfilms,'" *Gesnerus* 66, no. 1 (2009): 67-102. Perhaps the most famous of the films the DHMD produced, because a partial copy is extant, is *Krebs* (1930). A tribute to Lingner, the film encourages viewers to seek medical assistance early. Schmidt, "Sozialhygienische Filme," 56-58.

³⁸⁷ Despite the hype around films, sometimes lantern slides were preferable: not only was the equipment was often more transportable, but because the images did not move, the lecturer had plenty of time to explain all the relevant details. Dr. Werner Fischer-Defoy, "Der Film im Dienste der hygienischen Aufklärung," *Öffentliche Gesundheitspflege* Heft 5 (1919): 145-152. "As a visual aid for popular education (*Volksbildung*), lantern slides are still superior to films," page I/27, "8. Das Lichtbild in der hygienischen Volksbildung," *Der hygienische Lehrbedarf* (1926), DHMD 2003/190.

³⁸⁸ "Lichtspielgesetz. Vom 12. Mai 1920," *RGBI* Nr. 107 (1920): 953-958.

Ulf Schmidt suggests that critics and censors attributed to hygiene films greater effectiveness than other contemporary sources on reception did.³⁸⁹ For his part, by 1926 Martin Vogel had accumulated an annotated list of 340 German or Austrian films on biology and hygiene from more than fifty producers.³⁹⁰ Although the DHMD made no films on nutrition in this period, others produced food advertisements, comedic shorts on the importance of dairy products, and even documentaries about the urban food supply chain.³⁹¹ A film on the basics of nutrition was screened to praise at the 1928 “Nutrition” exhibition in Berlin, and free screenings of films made by the food industry accompanied the “Proper Nutrition” traveling exhibition in 1928-1929.³⁹²

The most visually arresting object in the new museum building, no taller than an average man, was the literal and figurative heart of the German Hygiene Museum, the Transparent Man (*der gläserne Mensch*). In the middle of the building, a gothic arch and a semi-circular recess housed a captivating figure composed of a metal skeleton, wax organs, and a clear plastic Cellon “skin.” An interactive marvel of biology and technology, its organs lit up at the touch of a button while a recorded female voice recited facts about the part in question.³⁹³ His arms and face lifted in a sun-worshiper pose, he appealed to a higher order than that of the mortals clustered around his dais.³⁹⁴ This was the human body on display as science *cum* art as never before. A museum prospectus described it as “a representation . . . that finally realizes Lingner’s old idea of demonstrating in a distinctive way man as a technical and artistic masterpiece.”³⁹⁵

³⁸⁹ Schmidt, “Sozialhygienische Filme,” 67, 71.

³⁹⁰ Martin Vogel, “Hygienische Filme,” *Hyg. Weg.* 1, no. 4 (Oct. 2916): 1-101.

³⁹¹ *Schlaraffenland* (1927), Sig. 20151; *Seff auf dem Wege zu Kraft und Schönheit* (1926), Sig. 15517; *Milch gibt Kraft und Gesundheit* (1920), Sig. 20370 ; *Der Bauch von Berlin* (1922), Bundesfilmarchiv, Berlin-Wilmersdorf.

³⁹² “Die Ernährung. Die Ausstellung der Stadt Berlin und des Deutschen Hygienemuseums,” *DA* 198, no. 187 (21 April 1928): 4; docs 1-8, Ausstellung “Richtige Ernährung,” D IV 4696 b, Stadtarchiv Braunschweig.

³⁹³ For details, see Eben J. Carey, “The Transparent Man,” in *Medical Science Exhibits: A Century of Progress. Chicago World’s Fair 1933 and 1934* ([Chicago]: [n.p.], 1936), 40-41.

³⁹⁴ Gebhard, *Im Strom und Gegenstrom*, 97-98; Rosmarie Beier and Martin Roth, eds., *Der Gläserne Mensch—Eine Sensation* (Stuttgart: Verlag Gerd Hatje, 1990); Vogel, “The Transparent Man.”

³⁹⁵ *Prospekt*, 12.

The Transparent Man (and the Woman completed later) enabled something more powerful than any preceding anatomical model: a display of the interior of the body in harmony with its exterior, of the parts with the whole, and—by extension—of the citizen and the state. The alcove that jutted into the central garden was not just a shrine to *an* individual—it was a temple to *the* individual and to the state of human perfectibility anybody could attain if he or she only tried hard enough.³⁹⁶ Moreover, this was a status every citizen should—must—strive to attain, for the good of the social body, by 1930 already represented by the German state.

The German Hygiene Museum's goal was to impress upon its patrons that their bodies, too, were intimately knowable, and that they could live hygienically through such everyday actions as sanitary food preparation, responsible reproduction, and the prevention of infection. As the museum guidebook put it, "In himself man finds the greatest wonder of the world, when he considers the museum's figurehead [and] looks around and in himself with an interested eye, and out of this will grow regard for his body and a deep feeling of responsibility for the highest good he has to protect, his health."³⁹⁷ This was a very intimate and yet extremely empowering message: the laity needed science to discover the body's secrets and the museum to explain it to them, and then it was up to each man, woman, and child to realize the paradigm embodied in the Transparent Man.

This visuality never existed in a corporeal vacuum, as if visitors' seeing eyes were somehow unconnected to other parts of their bodies. Rather, a great deal of attention was paid not just to visitors' psychology but also to their physiology. Most commonly, DHMD exhibit

³⁹⁶ Museum publicity materials in the 1930s did refer to the exhibit as "the temple of the Transparent Man." E.g. *Das Deutsche Hygiene-Museum Dresden im Jahre 1936*, 8, and *Das Deutsche Hygiene-Museum Dresden im Jahre 1937*, 13, DHMD Bibliothek, Hyg. A III 13/490, 36 and 37.

³⁹⁷ "In sich findet der Mensch die größten Wunder der Welt, wenn er, worauf das Wahrzeichen des Museums hinweist, mit wachem Auge um sich und in sich blickt, und daraus wird ihm Achtung vor seinem Körper erwachsen und ein tiefes Verantwortlichkeitsgefühl für das höchste Gut, das er zu bewahren hat, die Gesundheit." *Museums-Führer*, 19.

designers worried that their audiences' nervous systems—already strained by urban life and exhausted by a full day's work—would be further taxed by the amount of information on display. As spectacular as they appeared, DHMD events were not the only visual stimuli competing for Germans' attention. In 1930 Ernst Krantz wrote sympathetically of the pictographic barrage that confronted a big-city dweller, “who learns how to close himself off as with a shell against intrusive external impressions.”³⁹⁸ The best way to prevent “looking fatigue” (*Schaumüdigkeit*) among exhibit-goers was to provide clear explanations, avoid extraneous details, and include variety.³⁹⁹

In addition to visitors' tired brains, exhibit designers took into account their sensitive stomachs. Lingner had considered this in 1903 and designed the epidemics pavilion such that visitors had to re-enter the spacious central hall before proceeding to the next booth and the next infectious disease. Surrounded by soothing colors and potted plants, “here one could settle on low armchairs and divans, recover from what had been seen and gather new strength and desire to contemplate the next disease depiction.”⁴⁰⁰ Mind and body recovered, s/he could continue with the looking experience, which might produce a variety of emotions and reactions, from curiosity to revulsion. For example, the black-and-white photography of that time being of limited value in depicting skin conditions, wax moulages stood out with both three dimensionality and life-like color.⁴⁰¹ Although a mold of a patient's genitals ravaged by syphilis

³⁹⁸ “Die Zauberkünste der Reklame geben auch den Erfolg, daß der Mensch, zumal der Großstädter sich gegen zudringliche Eindrücke von außen wie mit einem Panzer abzuschließen lernt.” Krantz, “Ausstellungskunst,” 100.

³⁹⁹ Krantz, “Ausstellungskunst,” 100. See also Karl Süpfle: “the exhibition will be interesting, rich in variety in the overall impression and in the optical forms of expression, on the one hand in order to awaken interest and joy at learning in visitors, and on the other hand to hold off the risk of apathy and fatigue.” *Amtlicher Führer*, 37.

⁴⁰⁰ “Hier konnte man sich auf schwelenden Fauteuils und Diwans niederlassen, sich von dem Gesehenen erholen und zur Beschauung der weiteren Krankheitsbilder wieder neues Vermögen und neue Lust sammeln.” Lingner, “Einige Leitgedanken zu der Sonderausstellung,” 541.

⁴⁰¹ Krantz, “Ausstellungskunst”; Thomas Schnalke, “In the Service of Public Health Education: Moulages in Dresden,” *Diseases in Wax: The History of the Medical Moulage*, trans. Kathy Spatschek (Carol Stream, IL: Quintessence Pub. Co, 1995), 121-143.

might attract viewers due to the risqué subject matter, Vogel worried that the fear (or titillation) it engendered would not be very useful in teaching appropriate sexual behavior.⁴⁰² The curtain and warning sign that separated vulnerable viewers (namely children, but also women) from displays related to sex and reproduction could attract as much as repel.

Acknowledging the fact that—even without the strong smells of an anatomy lab—the preparations of normal anatomy and physiology could sometimes make visitors queasy also acted as a critique of the popularizing mission of the museum. In a cartoon published during the 1925 Hygiene Exhibition in Vienna and reprinted the next year in the hygiene education trade journal *Hygienischer Wegweiser*, artist Ladislaus Tuszynski (1876-1943) questioned the assumption that the exhibits were appropriate and effective as “an academy for everyone.”⁴⁰³ The caricature on page 140 suggests that there was nothing enlightening about seeing what intact skin decorously hid from view. Neither was the “delicate sex” the only one that could be affected. Some sights could or should not be seen because the mind or the stomach could not handle them. These fictional visitors had certainly not learned that their bodies were “the greatest wonders of the world.” Here is one (hypothetical) example of the limits of anatomical spectacles: they could be psychologically or physiologically overwhelming to viewers.

And in fact, despite all the care put into designing an exhibition to be clear, thorough, and aesthetically pleasing, Vogel did not trust the viewing public to absorb the appropriate messages. Although the museum existed for educational purposes, it relied at least a little bit on sensationalism to get people in the door. Vogel admitted that the general public preferred entertainment. With hundreds of thousands “storming” the 1918 traveling show on venereal disease that the

⁴⁰² Vogel, “Wie veranstaltet man hygienische Ausstellungen?,” 12.

⁴⁰³ In Vogel “Wie veranstaltet man hygienische Ausstellungen?,” 12; orig. pub. as “Hygienisches—Allzuhygienisches,” *Der Götz von Beleidungen* Nr. 18 [1925]: 8, doc. 15; later in *Der Abend* (16 May 1925), doc. 16, Bd. 2 Hygiene-Ausstellung Wien 1925, Nr. Z Zeitungsausschnittsammlung, 13658 Deutsches Hygiene-Museum Dresden (DHMD), SHAD.

German Hygiene Museum and the German Society for the Combating of Sexual Diseases (*Deutsche Gesellschaft zur Bekämpfung der Geschlechtskrankheiten*) had created, morbid curiosity and titillation could not be excluded from the motivations for attendance at exhibitions or films.⁴⁰⁴ For this reason the work of designing and running an exhibition did not end when the opening ceremony started. Rather, the staff had to be constantly available to shape the public's reception. After the speeches at an opening, a guide should walk the invited luminaries through the displays, and exhibition staff or local physicians should always be available to help visitors learn the material, answer questions, and give tours to school or community groups. Indeed, a reviewer of a traveling exhibition in Braunschweig credited ancillaries to the displays such as tours by local physicians, lectures, and films for facilitating exhibition visitors' learning.⁴⁰⁵

By 1930, the exhibitions' dual goals of inculcating best practices for individual and collective hygiene had tipped decisively toward insisting on the protection of the social body. Furthermore, the coercion latent in museum materials had become decidedly gendered. Although the leaders of the DHMD cast their educational materials as suitable for "everyone," they confronted the reality that women in the roles of wives and mothers (whether or not they also worked outside the home) had more influence over their households' consumption habits than men did: they held the purse strings and tied the apron strings. These fears and responsibilities were crystallized in the "Healthy Woman—Healthy Volk" traveling exhibition designed in the winter of 1931/32. Publicity materials for it described the typical woman as "the source of strength for the family and protector of health" and "the trustee of a large part of the nation's

⁴⁰⁴ Vogel, "Wie veranstaltet man hygienische Ausstellungen?," 10.

⁴⁰⁵ "Ausstellung 'Richtige Ernährung'," *Allgemeinen Anzeiger* (24 June 1929), doc. 114, Ausstellung "Richtige Ernährung," D IV 4696 b, Stadtarchiv Braunschweig. For American counterparts, Carey, *Medical Science Exhibits*, 31; Leslie Reagan, "Projecting Breast Cancer: Self-Examination Films and the Making of a New Cultural Practice," in *Medicine's Moving Pictures: Medicine, Health and Bodies in American Film and Television*, ed. Leslie Reagan, Nancy Tomes, and Paula Treichler, 163-195 (Rochester: University of Rochester Press, 2007).

store of health.”⁴⁰⁶ “In addition [to protecting her own health],” explained Seiring, “the German housewife today carries the difficult and responsibility-laden commitment to care for the health and well-being of her family, especially through proper, sensible diet.”⁴⁰⁷ What neither the Kaiser nor the “Food Czar” at the head of the War Food Office (*Kriegsernährungsamt*, KEA) in Berlin could do during World War I, German women must do for themselves: ensure the health and well-being of their families and their nation by purchasing German-grown products, preparing them properly, and eating them together.

As consumers of hygiene knowledge and of market goods, women attracted special scrutiny. Vogel mentioned careful monitoring of public reception was particularly important for displays on the care of infants, implying that women’s misinterpretations were both more common and more detrimental than men’s misunderstandings. A journalist in Braunschweig agreed: “the image alone does not suffice. One must add the spoken word to that, one must speak plainly and address oneself to the housewife who does not have time to [re]create the scientific foundations of nutrition in the kitchen.”⁴⁰⁸ Ironically, women were apparently too busy applying hygienic principles to spend voluminous amounts of time getting a thorough education in them. Because women’s social roles as wives and mothers made them responsible for the health and well-being of their families through breastfeeding, clothing, cooking, cleaning, and nursing the

⁴⁰⁶ From the anonymous author of *Gesunde Frau—Gesundes Volk*, Sonderbeilage für Breslauer Neuester Nachrichten (4 Sept. 1932): 1: “die Kraftquelle der Familie und Hüterin der Gesundheit”; and from the head of the Reichsausschuss für hygienische Volksbelehrung, Dr. Curt Adam: “die Treuhänderin eines großen Teils des gesundheitlichen Volksvermögens.” Doc. 79a, Bd. 2 Der Krebs und seine Bekämpfung, 1929-1930, Nr. Z, 13658 DHMD, SHAD. This exhibition was revised in 1933 to reflect NS racial ideology: see “Gesunde Frau—Gesundes Volk” (1934), DHMD 2006/476.1-25.

⁴⁰⁷ “Darüber hinaus liegt aber der deutschen Hausfrau heute die schwierige und verantwortungsschwere Verpflichtung auf, für das gesundheitliche Wohlergehen ihrer Familie zu sorgen, vor allem durch richtige, zweckmäßige Ernährung.” Georg Seiring, “Die Aufgaben der Ausstellung,” in *Gesunde Frau—Gesundes Volk*, Sonderbeilage der Breslauer Neuester Nachrichten (4 Sept. 1932): 1, doc. 79a, Bd. 2 Der Krebs und seine Bekämpfung, 1929-1930, Nr. Z, 13658 DHMD, SHAD.

⁴⁰⁸ “Aber das Bild allein tut es nicht. Man muß das gesprochene Wort dazusetzen, man muß volkstümlich reden und sich an die Hausfrau wenden, die keine Zeit hat, in der Küche wissenschaftliche Grundlagen der Ernährung zu erschöpfen.” “Die richtige Ernährung. Die Ausstellung in Braunschweig wurde heute eröffnet,” *Braunschweigischer Neueste Nachrichten* (13 June 1929), doc. 99, D IV 4696 b, Stadtarchiv Braunschweig.

sick, the effects of their actions multiplied, rippling up and down the levels of the telescopic body. Thus, their visits to hygiene exhibitions and courses were more fraught than men's, with the potential for both greater good and greater ill in the national body.

Conclusion

German Hygiene Museum staff actively sought to anticipate and shape audience responses to exhibitions. As Scientific Director of the museum, Martin Vogel especially positioned himself and the DHMD as experts not only in hygiene but also in hygiene education.⁴⁰⁹ According to the narrative often told by and about the DHMD, before Lingner supposedly there was no visual hygiene education, or it was well meaning but poorly constructed.⁴¹⁰ But “good intentions alone do not suffice” for putting on successful shows (anymore), claimed Vogel in 1926: expertise was necessary not just in the subject area but also in exhibition technology and psychology.⁴¹¹ The Hygiene Museum was a leader in this field, and for the benefit of the new class of hygiene educators, Vogel sought to educate them through the Reichsausschuss für Volksbelehrung and the *Hygienischer Wegweiser*. In the journal's inaugural essay, he proffered advice on everything from choosing the subject of an exhibition to the best temporal and spatial characteristics for eliciting the desired response from the visiting public.⁴¹² His suggestion to organize exhibits from simple to complex in order to enable their

⁴⁰⁹ E.g. Martin Vogel, “Probleme der Darstellungstechnik,” *Hyg. Weg.* 4, no. 3 (March 1929): 60-75; Marta Fraenkel, “Wie muß eine Ausstellung beschaffen sein, um belehrend zu wirken?” *Hyg. Weg.* 4, no. 3 (March 1929): 75-79.

⁴¹⁰ “Before the museum work began, there were not only in Germany but all over the world almost no useful visual aids for hygiene education.” Albrecht, *Sein Intl Gesundheitsdienst* (1931), 65; Gebhard, *Im Strom und Gegenstrom* (1976) 35-36. Scholars have refuted this conceit: Günter Heidel, “Die I. Internationale Hygiene-Ausstellung in Dresden und die Gründung des Deutschen Hygiene-Museums,” *Zeitschrift für die gesamte Hygiene und ihre Grenzgebiete* 33, no. 8 (1987): 411-415; Eike Reichardt, *Health, Race and Empire: Popular-Scientific Spectacles and National Identity in Imperial Germany, 1871-1914* (Lexington, KY: Lulu.com, 2008).

⁴¹¹ “Der gute Wille allein genügt nicht, dafür sind die Fachleute an zentrale Stelle da.” Vogel, “Wie veranstaltet man hygienische Ausstellungen?,” 5-6. For similar professionalization in medical museums, see Sidney Herbert Daukes, *The Medical Museum: Modern Developments, Organisation and Technical Methods, Based on a New System of Visual Teaching* (London: Wellcome Foundation, 1929).

⁴¹² Vogel, “Wie veranstaltet man hygienische Ausstellungen?,” 5-32.

comprehension by weary workers who came in after a long day also facilitated the narrative progression of telescopic thinking from lowest to highest levels of magnification. In Vogel's beloved field of nutrition, this meant progressing from elements through macromolecules to whole foods that made up a meal, the family's weekly menu, the average diet of the population, and the nutritional and economic practices of the German nation.⁴¹³

The German Hygiene Museum enjoyed a positive reputation in and beyond Dresden, but as I have suggested, it had its share of critics. Besides Tuszynski's humorous cartoons, proletarian journalists protested that the exhibitions catered to the middle classes and ignored the difficulties the working classes had feeding their families on meager wages. Some observers complained that in those economically difficult times, governments should not be spending public dollars on yet another exhibition to the material gain of a private institution.⁴¹⁴ Others criticized an institution dedicated to hygiene for serving alcohol and allowing brewers to display.⁴¹⁵ Behind the façade of the DHMD, sometimes the museum staff disagreed amongst themselves. For instance, Assistant Science Director Bruno Gebhard wrote in his autobiography,

The section on nutrition that Vogel created covered a comparatively large amount of material among the museum collections, but it contained too many numbers and particulars. Vogel had committed the cardinal sin of a health educator: he wanted to show everything that he knew about the food problem.⁴¹⁶

Gebhard also preferred working on the traveling exhibitions rather than on the museum displays,

⁴¹³ For more see Ragnar Berg and Martin Vogel, *Die Grundlagen einer richtigen Ernährung*, 1-7. Aufl. (Dresden: Deutscher Verlag für Volkswohlfahrt, 1925-1930). Thirty thousand copies were printed.

⁴¹⁴ E.g. Württembergisches Staatsministerium, to International Hygiene Ausstellung Dresden 1930, 23 Aug. 1929, doc. 105-106, Nr. 592 IHA 1930 Bd. 1 (1930), 11168 MfW, SHAD; "Eine städtische Garantie gegenüber der Internationalen Hygiene-Ausstellung 1930," *DA* 200, no. 100 (28 Feb. 1930), doc. 164, Nr. 593 IHA 1930 Bd. 2 (1930), 11168 MfW, SHAD. Opponents of the plan support the 1930 show with municipal funds included city council representatives from the Communist, Deutsche National, and National Socialist Parties.

⁴¹⁵ Dr. Doris Hartwig-Bünger and the Stadtbund der Dresdner Frauenverein, 13 Nov. 1929, to IHA 1930, doc. 150-151, Nr. 592 IHA 1930 Bd. 1 (1930), 11168 MfW, SHAD.

⁴¹⁶ "Die von ihm bearbeitete Abteilung 'Ernährung' war innerhalb der Museums-Sammlungen verhältnismäßig ausführlich behandelt, aber sie bestand aus zu vielen Zahlen und Einzelheiten. Vogel hatte die Kardinalsünde eines Gesundheitserziehers begangen: Er wollte zeigen, was er alles über die Ernährungsfrage wußte." Gebhard, *Im Strom und Gegenstrom*, 47-49, qtn on 45.

because the designers had been instructed to present only the barest facts in the politically “neutral” halls of the museum, whereas in exhibitions they could engage the public with social questions like “every child his own bed” (to prevent tuberculosis transmission). Vogel agreed in his own way: he felt that the museum board of directors was too conservative in its guidelines and that he should have been allowed to present “the facts” about newer research on nutrition so visitors could decide for themselves whether they wanted to adhere to a conventional diet or adopt alternative principles like vegetarianism.⁴¹⁷ Naturally he believed his views were the best for both individual health and national welfare.

In fact, the German Hygiene Museum performed a delicate balancing act between justifying its existence because of the ignorance of the public and appealing to the same public as capable of self-education. Its leaders hyped citizens’ participation in public health as a new development, even as they harnessed existing popular enthusiasm for hygiene. In 1903 Lingner defended “his” special exhibition on infectious diseases at the German Cities Expo by asserting that “the loftiest state regulations fail if they are set against the ignorance of the population.”⁴¹⁸ A decade later, he wrote in the 1912 *Denkschrift* that founded the museum: “The modern person wants to know and then do.”⁴¹⁹ In contrast to large, state-run public health projects in the nineteenth century like canalization and the quarantine of contaminated ships and infected persons, public health was increasingly focused on what individuals could do (or eat) in their own daily lives.⁴²⁰ This made (personal) hygiene different from other sciences like bacteriology, biochemistry, or balneology, which conventional experts practiced at a remove from the public

⁴¹⁷ Martin Vogel, *Denkschrift, dem Vorstand des Deutschen Hygiene-Museums...vorgelegt am 29.6.1932*, pp. 34-43 in Nr. 69.4, 11.3.13686 Deutsches Hygiene-Museum e.V. (1908-1946), SHAD.

⁴¹⁸ Lingner, “Einige Leitgedanken zu der Sonderausstellung,” 533.

⁴¹⁹ “Der modern Mensch will wissen und dann handeln.” Lingner, *Denkschrift*, 11.

⁴²⁰ Paul Weindling, “Public Health in Germany,” in *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times*, ed. Dorothy Porter, 119-131 (London: Routledge, 1999).

eye. Knowledge was power, and the appropriate agents of the power of hygiene were ordinary citizens working in concert with the government.

Thus it was crucial that the population have access to good information. Vogel justified the extensive treatment of nutrition in the museum because “in hardly any field of public health as in nutrition are there so many traditional prejudices and misunderstood buzz words, so many superficial observations and erroneous deductions, as well as so many irrelevant and extraneous details that confuse the picture.”⁴²¹ Rather than produce new scientific knowledge, the museum workers consolidated and translated the existing mass of information into easily digestible chunks.⁴²² When it came to nutrition, this mission was immediately complicated by Vogel’s presence and influence, since he had a different opinion about what was prejudicial and erroneous than many mainstream experts: in addition to advocating vegetarianism, he was also a teetotaler and promulgated Ragnar Berg’s theory of acid-base balance (see Chapter 3).

It seems that because Germans had the responsibility to educate themselves, public health reformers had to believe they had the ability to comprehend the lessons and to implement them. The DHMD would be their partner in this. It was hardly the first or only organization offering to educate housewives, physicians, schoolteachers, factory workers, children, and others in health and hygiene, but it operated on a grand scale and was one of the best known. Seiring quoted Lingner’s *Denkschrift* in the guidebook when the new building opened in 1930:

A museum in the present meaning of the word is not what will be established here in Dresden. The planned institute will develop more as a kind of academy, in which anyone through observation [or contemplation] and individual self-teaching can acquire knowledge about hygiene, but also one in which any expert, through systematic courses, will be offered the possibility to broaden his knowledge in the most diverse areas of

⁴²¹ “Kaum auf irgend einem Gebiet der Gesundheitspflege gibt es wie in der Ernährung so viele überlieferte Vorurteile und unverstandene Schlagworte, so viele oberflächliche Beobachtungen und Fehlschlüsse, auch so viele unsachliche und außerwesentliche Gesichtspunkte, die das Bild verwirren.” *Museums-Führer*, 27.

⁴²² Vogel, “Aus der Wissenschaftlichen Werkstatt,” in *Amtlicher Führer*, 94-99, esp. 98.

hygiene.⁴²³

Under the mantra of self-help (*Selbsthilfe*),⁴²⁴ exhibition and museum visitors were expected to be active participants in their learning. However, visitors were not supposed to leave an exhibition with the same breadth and depth of knowledge as an expert in tuberculosis control or vitamin research. As Walter Benjamin wrote of an exhibition in Berlin, “The visitors ... should remain laymen. They should leave the exhibition no more learned but more savvy. The task of real, effective presentation is just this: to liberate knowledge from the bounds of the compartmentalized discipline and make it practical.”⁴²⁵ In other words, each needed to know what was appropriate for his or her place on the knowledge continuum, and the German Hygiene Museum would provide them spectacular exhibits in the service of the project of national health (*Volks-gesundheit*).

What they were supposed to learn was how intricate their bodies were and how intimately their bodies were connected to other Germans’. In 1912 Lingner had exclaimed, “Whoever understands human beings understands the world!”⁴²⁶ Over the next three decades, this microcosm-macrocosm binary was expanded to levels above and below “the individual” to include all the parts of the telescopic body: cells, organs, families, and nations. Karl Süpfle

⁴²³ “Ein Museum in des Wortes gegenwärtiger Bedeutung ist es also nicht, was hier in Dresden errichtet werden soll. Das geplante Institut wird sich mehr zu einer Art Akademie herausbilden, in der jedermann, ohne an bestimmte Zeiten und begrenzte Themata gebunden zu sein, sich durch Anschauung und eigenartigen Selbstunterricht nach freiem Belieben Kenntnisse über die Gesundheitspflege in all ihren Teilen erwerben kann, in der aber auch jedem Fachmann durch systematische Kurse die Möglichkeit geboten wird, sein Wissen auf den verschiedenartigsten Gebieten der Hygiene zu erweitern.” Lingner *Denkschrift*, 8; as quoted in Seiring, *Das Zentralinstitut für Volks-gesundheitspflege*, 3-4.

⁴²⁴ E.g. “das Volk has begun to want to help itself,” Anna Fischer-Dückelmann, *Die Frau als Hausärztin*, 2. Aufl. (Stuttgart: Süddeutsches Verlags-Institut, [1907]), VI. See also Michael Hau, *Cult of Health and Beauty in Germany: A Social History 1890-1930* (Chicago: University of Chicago Press, 2003).

⁴²⁵ Walter Benjamin, “Bekränkter Eingang: Zur Ausstellung ‘Gesunde Nerven’ im Gesundheitshaus Kreuzberg,” *Die Literarische Welt* 6, no. 2 (10 Jan. 1930); trans. as “Garlanded Entrance: On the ‘Sound Nerves’ Exhibition at the Gesundheitshaus Kreuzberg,” in *The Work of Art in the Age of its Technological Reproducibility, and Other Writings on Media*, by Walter Benjamin, Michael William Jennings, Brigid Doherty, Thomas Y. Levin, and E.F.N. Jephcott, 60-66 (Cambridge, MA: Belknap Press/Harvard University Press, 2008), 61. The DHMD had provided the materials for the “Healthy Nerves” exhibit at the Gesundheitshaus Kreuzberg.

⁴²⁶ “Wer den Menschen begreift, begreift die Welt!” Lingner, “Der Mensch als Organisations-Vorbild,” 37.

articulated this upon the opening of the 2. IHA in 1930:

May the visitors who receive insight into important practical results of all this diligent research, which is much more arduous to conduct than to learn about, gain an increased understanding of the fact that the fate [or survival] of the entire *Volk* is intimately linked with the progress of science. May this knowledge culminate in the consciousness that all classes of our *Volk* are closely interrelated and need to be in mutual understanding and aid, in communal feeling, thinking, and working!⁴²⁷

Connected psychologically and biologically, Germans had a responsibility not just for their own health but for that of the nation. And due to the commutative property of health in the telescopic body, even things as small as vitamins and minerals were important to that fate. The next chapter follows the development and dissemination of naturopathic Swedish chemist Ragnar Berg's theory about minerals and acid-base balance from his laboratory in Loschwitz outside Dresden in the 1900s through his professional connections to scientists, physicians, the canning industry, and the German public in the 1920s and 1930s. Like Lingner and his some-time co-author Vogel, Berg felt an evangelical need to share his scientific knowledge with the country's industrial and domestic cooks as middle-men and –women in the telescopic body.

⁴²⁷ “Mögen die Besucher, die in der Ausstellung mühelos Einblick in praktisch wichtige Ergebnisse emsiger und vielseitiger mühsamer Forschungsarbeit erhalten, ein erhöhtes Verständnis dafür gewinnen, daß das Lebensschicksal des ganzen Volkes mit den Fortschritten der Wissenschaft aufs innigste verknüpft ist. Möge diese Erkenntnis in dem Bewußtsein gipfeln, daß alle Schichten unseres Volkes aufs engste miteinander verbunden sind und sein müssen im gegenseitigen Verstehen und Helfen, im gemeinsamen Fühlen, Denken und Arbeiten!” “Wesen und Ziel der Internationalen Hygiene-Ausstellung,” in *Amtlicher Führer*, 38.

Chapter 2 – Illustrations

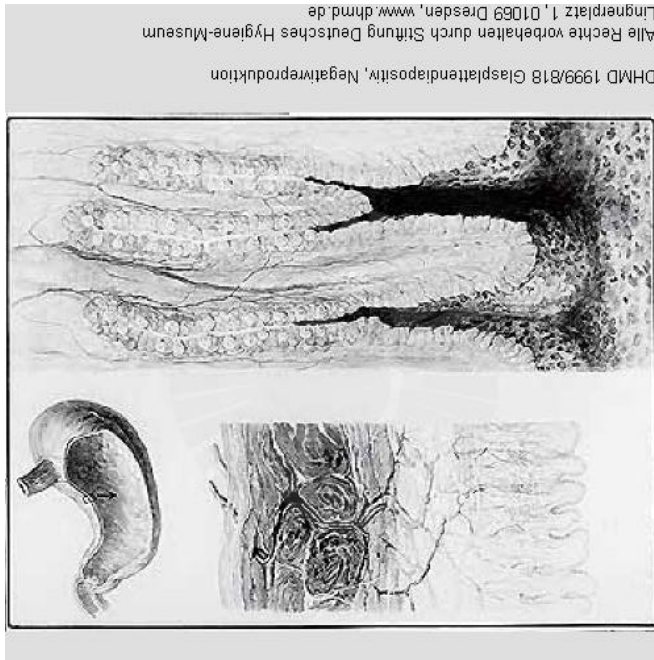


Illustration 2.1. This glass lantern slide depicts the stomach (with a large window cut into it). The box and arrow refer to the enlargement of the gastric wall below. The largest section of the image shows the folds of the inner lining of the stomach, called rugae.⁴²⁸

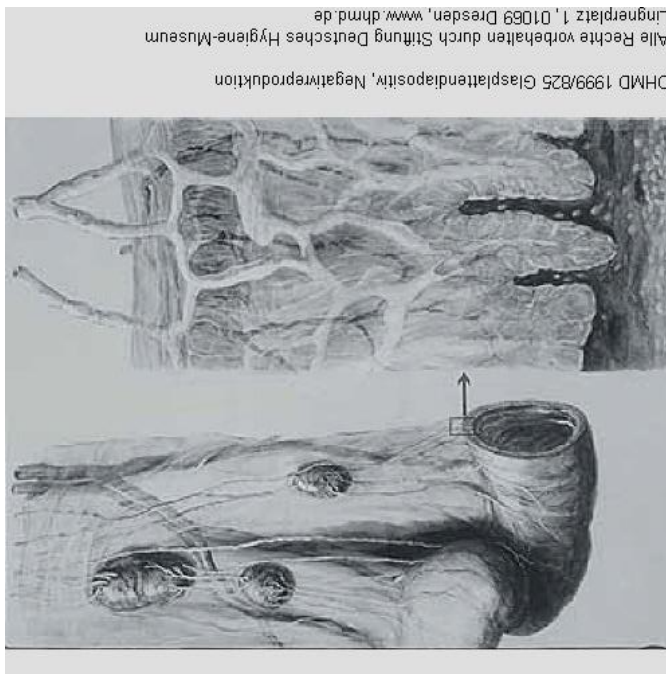


Illustration 2.2. This glass lantern slide shows a segment of small intestine hanging in the mesentery that holds the blood vessels and lymph nodes. The box and arrow point to an enlargement of the intestinal wall, with villi and blood supply.⁴²⁹

⁴²⁸ Slide 26 “Der Bau der Magenschleimhaut (stark vergrößert),” Lecture 6 “Verdauungsorgane” (um 1923), DHMD 1999/818; and Slide 16 “Der Bau der Magenschleimhaut,” Lecture 35 “Die Ernährung des Menschen” (um 1924), DHMD 2002/1203, DHMD Archiv, Dresden.

⁴²⁹ Slide 33 “Ausschnitt aus der Wand des Dünndarms mit ihren Lymphgefäßen bei stärkster Vergrößerung,” Lecture 6 “Verdauungsorgane” (um 1923), DHMD 1999/825; and Slide 20 “Ausschnitt aus der Wand des Dünndarms mit ihren Lymphgefäßen bei stärkster Vergrößerung,” Lecture 35 “Die Ernährung des Menschen” (um 1924), DHMD 2002/1207, DHMD Archiv, Dresden.

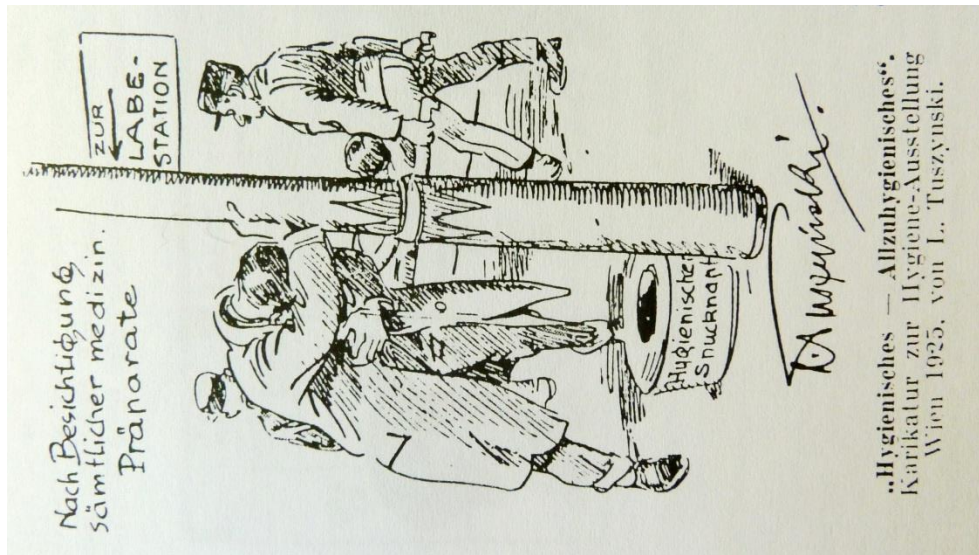


Illustration 2.3. “Hygienic—All Too Hygienic.” Under the heading, “After the viewing of all the medical preparations,” two orderlies carry away a supine figure on a stretcher, while in the foreground a man leans against a pole and vomits into a container labeled “hygienic spittoon.”⁴³⁰

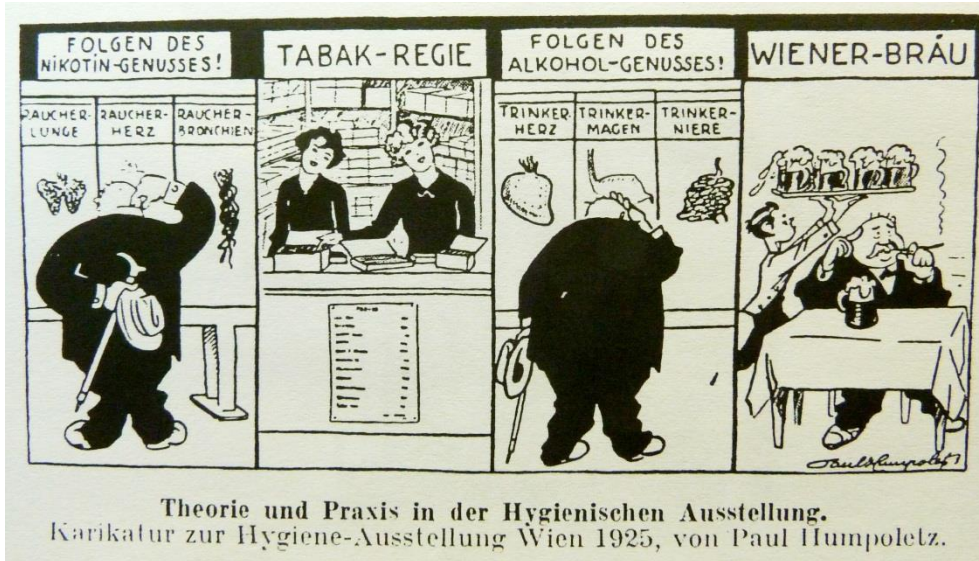


Illustration 2.4. “Theory and Praxis in the Hygiene Exhibition.” Paul Humpoletz (1889-1972) lampoons the exhibitions for juxtaposing warnings against smoking and drinking alcohol with tobacco sellers and brewers (i.e. doc. 16a). These industries were included under the rubric of “food and luxury goods” (*Lebens- und Genußmittel*).⁴³¹

⁴³⁰ Martin Vogel “Wie veranstaltet man hygienische Ausstellungen?,” *Hyg. Weg.* 1, no. 1 (1926): 12; doc. 15, Bd. 2 Hygiene-Ausstellung Wien 1925, Nr. Z Zeitungsausschnittsammlung, 13658 Deutsches Hygiene-Museum Dresden (DHMD), SHAD.

⁴³¹ Vogel “Wie veranstaltet man hygienische Ausstellungen?,” *Hyg. Weg.* 1, no. 1 (1926): 14; doc. 16a, Bd. 2 Hygiene-Ausstellung Wien 1925, Nr. Z, 13658 DHMD, SHAD.

Chapter 3: How to Cook Your Vegetables, or Ragnar Berg's Controversy with the Canning Industry

Processing peas: For canning only freshly picked, tender raw material should be used. If these are still unripe when they arrive, it is best to let them sit for a day. The peas are first shelled with a machine. ... After the shelling the kernels come to the sorting machine, whose work is regulated by automatic distributor so that it never jams. Sorting happens according to the 6 agreed-upon designations of quality: [from youngest/smallest to oldest/largest.] ... After sorting, the peas are blanched and then filled into cans when dry. One generally adds 1 kg of salt and 1 ½ kg of sugar to every 100 L of filling water. If the peas will be greened, estimate 20-25 g of copper sulfate for every hundredweight [50 kg] of kernels; they should be blanched in the copper solution at least 5 minutes and then rinsed three times. A number of factories use only clear water without any additives for filling, while others fill up [the cans] with the blanching water. For sterilization 115° [Celsius] should not be exceeded. 20 minutes suffice as the correct cooking time for 1/1 cans [800 ml]. Anticipate 10 minutes for the rise and the fall of the temperature. It is advisable to cool the cans after successful sterilization.⁴³²

~From the leading industry journal (1914)

Recipe Nr. 1429 Peas in Jars

The picked peas are spread out on the floor of the cellar and left to cool overnight. (Not to be left piled in the basket.) If handled when warm from the sun they will not keep [and is] the reason for the frequent lack of success with canned peas. They are filled into the jars raw, with 1 level tsp. salt for each 1-liter jar and enough cold water that the peas are evenly covered. Sterilization time: 1 ½ hours [in a water bath at 98° C] on the first day. Keep cold until second cooking. Check whether all jars are sealed and within three days [perform] a second cooking time of 1 hour. Or: the parboiled peas are filled into the jars with the cooking water and after cooling sterilized 1 hour. A second sterilization is not necessary.⁴³³ ~From the leading household cookbook (1935)

⁴³² "Verarbeitung von Erbsen. Für die Konservierung soll nur frisch gepflückte zarte Rohware verwendet werden. Aus Praxis und Wissenschaft. Ist diese bei der Anlieferung noch zu zart, so läßt man sie zweckmäßig erst einen Tag lagern. Die Ware wird zunächst auf maschinellm Weg gelöchtet. ... Nach dem Auslöchten kommt das Korn in die Sortiermaschine, deren Arbeit mittels automatischer Verteiler so geregelt wird, daß sich die Maschine nicht verstopft. Die Sortierung erfolgt nach den vereinbarten Qualitätsbezeichnungen in 6 Sorten: ... Nach dem Sortieren werden die Erbsen blanchiert und danach trocken in Dosen gefüllt. Dem Auffüllwasser setzt man gewöhnlich auf 100 l 1 kg Salz und 1 ½ kg Zucker zu. Sollen die Erbsen gegrünt werden, so rechnet man auf 1 Ztr. Korn 20-25 g Kupfersulfat; solche Ware ist in der Kupferlösung mindestens 5 Minuten lang zu blanchieren und danach noch dreimal auszuwässern. Eine Anzahl Fabriken verwenden zum Auffüllen nur klares Wasser ohne jeden Zusatz, wieder andere füllen mit dem Blanchierwasser auf. Beim Sterilisieren sollte nicht über 115° hinausgegangen werden. Für 1/1 Dosen gelten 20 Minuten als die richtige Kochzeit. Auf Steigen und Fallen der Temperatur sind je 10 Minuten zu rechnen. Nach erfolgter Sterilisation ist ein Abkühlen der Dosen zweckmäßig." C., "Aus Praxis und Wissenschaft: Verarbeitung von Erbsen," *Konserven-Ztg.* 15, no. 6 (6 Feb. 1914): 43. A "1/1 can" holds about 800 ml and weighs and about 1 kilogram.

⁴³³ "Nr. 1429 Erbsen in Gläsern. Die gepflückten Erbsen werden 1 Nacht zum Auskühlen auf dem Boden des Kellers ausgebreitet. (Nicht im Korb geschichtet zu lassen.) Sonnenwarm verarbeitet halten sie sich nicht. Der Grund des häufigen Mißerfolges mit eingemachten Erbsen. Sie werden roh in die Gläser gefüllt, auf je 1-l-Glas 1 gestrichener Teel. Salz und kaltes Wasser, soviel, daß die Erbsen eben bedeckt sind. Sterilisationsdauer: Am ersten Tage 1 ½ Stunden. Bis zum zweiten Kochen kaltzustellen. Zu untersuchen, ob alle Gläser schließen und innerhalb 3 Tagen zweite Kochdauer von 1 Stunden. Oder: die gargekochten Erbsen werden mit dem Kochwasser in die Gläser gefüllt und nach dem Erkalten 1 Stunde sterilisiert. Nachsterilisation nicht erforderlich." Henriette Davidis and Ida Schulze, *Das neue Kochbuch für die deutsche Küche*, 3. Aufl. (Bielefeld & Leipzig: Velhagen & Klasing, 1935), 331-332.

On June 1, 1929, less than two weeks before the German Hygiene-Museums' traveling exhibition "Proper Nutrition" (*Richtige Ernährung*) was scheduled to open in the Municipal Concert Hall in Braunschweig, an article in the *Braunschweigische Landeszeitung* carried the subtitle "The canning industry's protest against one-sided presentation."⁴³⁴ The previous evening, the City Medical Officer Dr. Sauer had met with other local leaders to discuss details for the event. Professor Dr. Hugo Kanter (1871-1938), business executive of the Union of German Canning Manufacturers (*Verein deutscher Konservenfabrikanten*), sharply protested the exhibit's characterization of Ragnar Berg as a scientific expert and its reliance on his "personal theories," which called into question the nutritional value of canned goods. Dr. Sauer agreed to halt the distribution of the accompanying guidebook and to contact the designers in Dresden about removing the offending references. When Kanter then declared that the canning industry's own special exhibit "would be based on science," unlike said guidebook, Herr Jung, the DHMD employee in charge of the traveling exhibition, countered that the exhibition had garnered only praise in the other cities it had visited, implying that Kanter's financial incentives biased his interpretation of the facts about food manufacture. It was the opening salvo of the latest battle waged between nutritional chemist Ragnar Berg, based in Loschwitz just outside Dresden, and the German canning industry concentrated around Braunschweig's famous asparagus fields.

For twenty years, Berg had been campaigning against the common practice in domestic and industrial kitchens of pouring off the water used to (par)boil fruits and vegetables. Blanching (*Abbrühen*) cleaned, sterilized, and softened fresh produce, either to be served immediately on the family table or to be packed into tin cans or glass jars for storage or sale. Housewives and canned-food manufacturers also "brewed" vegetables like onions and cabbage to remove

⁴³⁴ "Ernährungs-Ausstellung in Braunschweig. Ein Protest der Konserven-Industrie gegen einseitige Darstellung," *Braunschweigische Landeszeitung* (1 [Mai] 1929), doc. 68a, Bd. 2 Ausstellungen 1903-1932, Nr. Z Zeitungs-ausschnittsammlung, 13658 Deutsches Hygiene-Museum Dresden (DHMD), SHAD.

particularly strong smells and tastes and mushrooms to remove toxins, in which cases the blanching water was considered waste. But even the vegetable stock (*Brühe-* or *Gemüsewasser*) from more benign vegetables was rarely recycled into soups or sauces, unlike more flavorful meat stocks. For this reason, Berg called blanching “one of the greatest sins against the Holy Ghost of Hygiene, which is never forgiven and will be visited on the next generation.”⁴³⁵ In 1921 he even declared, “The boiling of vegetables like the blanching of canned vegetables damages the national health (*Volksgesundheit*) as well as the national economy (*Volksökonomie*) and must therefore be forbidden by law.”⁴³⁶

Well before the scientific discovery of vitamins in the 1910s and their acceptance in the 1920s, scientists and housewives alike knew that boiling foodstuffs left water-soluble compounds in the water. This was, after all, the fact exploited for the preparation of meat extracts like Liebig’s or vegetable broths like Lahmann’s. What scientists like Berg and business interests like Kanter could not agree on was whether blanching fruits and vegetables left behind more than dirt, germs, color, taste, and smell—and if it did, whether or not the result had the nutritional value of straw. Berg was among the most vocal reformers who suggested Germans should consume fresh produce raw, or if it needed to be cooked or sterilized, to steam it instead. He had mixed success. In popularizations of nutrition, his theories about minerals, acids, and bases were easily and quickly assimilated with older ideas about “nutrient salts” (*Nährsalze*) and newer ones about vitamins. Canners, backed by both industrial and university laboratory scientists, eventually settled for parboiling and sterilization times that were no longer than necessary to soften

⁴³⁵ “Denn das ist eine der schwersten Sünden wider den heiligen Geist der Hygiene, die nie vergehen, wohl aber sogar auf die Nachkommenschaft heimgemacht werden wird!” Berg to Dr. [Josef] Stimpfl, 10 May 1914, doc. 140-141 in Kopie-Buch Nr. 4, 12650 Personennachlass Ragnar Berg, SHAD. Repeated in Berg, *Alltägliche Wunder*, 2. Aufl. (Dresden: Emil Pahl, 1924), 36.

⁴³⁶ “Das Abbrühen der Gemüse wie das Blanchieren der Gemüsekonserven schädigt also gleichermaßen Volks- gesundheit und Volksökonomie und muß deshalb gesetzlich verboten werden.” Berg, “Das Abbrühen von Nahrungsmitteln,” *Chemiker-Zeitung* 45, no. 106 (3 Sept. 1921): 849-850, here 850.

vegetables and to kill bacteria and spores. But the manufacturers could not afford to admit that their products conformed to the letter of the “newer knowledge of nutrition,” if not to its spirit.⁴³⁷

Ragnar Berg’s controversy with the canning industry and its allied scientists over how to cook vegetables was not a merely academic dispute over boiling times and temperatures but rather a fundamental disagreement over how foods act on bodies, with pH balance the greatest bone of contention. Their arguments extended beyond the laboratory (and the factory) and demonstrate a telescopic perspective in the way they connected molecules not just to individual bodily health but to business interests and to the nation’s ability to hold out in World War I. Meanwhile, domestic scientists dispensing advice to housewives had by the mid-1920s integrated both positions and advocated more fruits and vegetables, both raw when in season and canned over the winter. Lest my argument about the development of the telescopic body as an organizing cultural metaphor seem overdetermined by the success of the German Hygiene Museum, in this chapter I show that the idea of health on lower (microscopic) levels was widely accepted, even as the details remained controversial and sometimes contradictory. The differential reception of knowledge about micronutrients further demonstrates that the continuum of scientific knowledge was not a unidirectional gradient from laboratory to kitchen.

Biographical background of Ragnar Berg

Born in Göteborg, Sweden, to a well-respected family, Carl Gustav Ragnar Berg (1873-1956) grew up to become a kindly gentleman in social settings but ambitious and argumentative in scientific matters.⁴³⁸ Despite his early interest in the study of nature, Berg was a poor student, avoided university, and trained as a chemical engineer. To advance his lofty career goals, he took

⁴³⁷ Elmer Verner McCollum, *The Newer Knowledge of Nutrition: The Use of Food for the Preservation of Vitality and Health* (New York: Macmillan, 1918), 137.

⁴³⁸ Most of the biographical details in this section come from Christian Rummel, *Ragnar Berg: Leben und Werk des schwedischen Ernährungsforschers und Begründers der basischen Kost* (Frankfurt am Main: Peter Lang, 2003).

a series of industrial positions in western Germany between 1896 and 1902. He admired the German Empire for its long history of cultural supremacy, the ideals of “God and Fatherland,” and its mythic relationship to his native Nordic country. With the financial security of a job offer from Karl August Lingner, in 1902 he married Ella Buscher (1876-1954) and had two sons with her. Like many native Germans, he got caught up in the glorious excitement of the early weeks of World War I, and like many, he was devastated to lose his best friend in the trenches.

Berg’s first decade in Dresden determined his professional and research agendas for the rest of his life. In late 1902, he began performing analyses for Lingner’s Central Department of Dental Hygiene (*Zentralstelle für Zahnhygiene*), then under the leadership of the dentist Carl Röse. Although Berg was promoted to Lingner’s factory laboratory in early 1903, and Röse took a job in Erfurt after Lingner closed the dental center in 1908, the two men continued to collaborate on the health effects of dietary acid and mineral content by monitoring their physiological functions on a variety of diets. Röse recommended Berg for his next and longest position, as head of the physiology laboratory at Lahmann’s Sanatorium at Weißer Hirsch outside Dresden (1909-1921). They had begun publishing their results in 1908, and by the time Berg’s work was displayed at the International Hygiene Exhibition in Dresden in 1911, he was convinced that acid-base balance was the key to human health and nutrition.⁴³⁹

Because of their respective educational backgrounds, Berg had the upper hand in their working relationship: “I am the chemist,” he wrote to a friend in 1902.⁴⁴⁰ Röse had many ideas, but Berg was the one responsible for conducting all the calculations and laboratory work on their food and bodily wastes. What is more, Berg seems to have believed his formal chemistry education and informal physiology self-education out-weighed his opponents’ formal physiology

⁴³⁹ Rummel, *Ragnar Berg*, 21.

⁴⁴⁰ “Ich bin der Chemiker.” Berg to Fr. Elschen [Elsa Richter], [1902], doc. 524 in Kopie-Buch Nr. 2, 12650 Berg, SHAD.

training and “deficient” understanding of chemistry. For instance, in a 1916 letter of complaint to the editorial board of the popular science periodical *Kosmos* about recent articles on national nutrition, Berg ended by quoting chemist Emil Fischer (1852-1919): “The public believes that every physician is a biologist. And yet one very rarely finds biological understanding among doctors; yes, one can confidently say that when a medical man starts to do chemical or physiological work, the result is always nonsense.”⁴⁴¹ Berg’s critics had the same opinion of the “science” that naturopathy sympathizers such as he and Röse conducted.

Despite their extensive research, the dissenting duo was not able to convince the mainstream medical or scientific communities that individual and collective health depended precariously on the consumption of less meat and bread and of more vegetables and potatoes. First, their qualifications were suspect: Röse was a dentist and Berg was a chemist without a Ph.D. who had made his name studying waxes, not food. Second, their institutional locations marked them as outsiders: Röse had left Dresden for private practice when Lingner closed the Central Department of Dental Hygiene in 1908 (due in part to disagreements over the dietary experiments), and Berg was employed at a naturopathic sanatorium, not a university, a government institute, or even a private chemistry laboratory. Third, the audience was unreceptive. The quantitative nutrition of Justus von Liebig, Carl von Voit, and Max Rubner dominated Germany’s main-stream nutritional community. Even during World War I, when Berg was promising a way for Germans to eat healthfully while consuming less of scarce animal products like meat and butter, influential personalities such as Rubner, Max Winckel, and W. H.

⁴⁴¹ “Das Publikum glaubt, dass jeder Arzt Biologe sein muss. Und doch findet man biologisches Verständnis sehr selten bei den Ärzten, ja, man kann getrost sagen, dass wenn ein Mediziner anfängt chemisch oder physiologisch zu arbeiten, das Resultat allemal Unsinn wird.” As quoted in Berg’s letter to the editors of *Kosmos*, 1 June 1916, doc. 25 in Kopie-Buch Nr. 5, 12650 Berg, SHAD. See also Berg’s letter to the Julius Springer publishing house, 3 Jan. 1913, doc. 900-901 in Kopie-Buch Nr. 3; and Berg to Herr Dr. Cornelius, 14 Nov. 1913, doc. 50-52 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

Jansen found faults in Röse and Berg's self-experimentation methods, doubted the generalizability of the results from so few subjects (n=1-3), and especially after the war—when Germany was campaigning for an end to the Allied blockade—proved unwilling to acknowledge lower meat or protein requirements.

Professional setbacks at the end of the war made it seem that Berg had no future in the medical and scientific community, so he decided to focus his efforts on publicizing his work directly to the lay public.⁴⁴² Through lectures, magazine articles, and popular books, Berg's reputation grew. In 1925, the alkaline food supplement he invented went on the market as Basica®.⁴⁴³ He was able to secure a hospital laboratory at the Dresden-Friedrichstädter Hospital for a few years (1927-1932) to do research involving food and urine analyses, and in 1930, New York Columbia Medical College granted him an honorary science doctorate. Berg accepted it as proof of the worth of his theories but regretted it had not come from a German institution.

The last quarter century of his life, Berg enjoyed great popularity among the life reform communities in Germany and Sweden. He had bemoaned bureaucratic incompetence during the Great War and mourned the loss of the Empire after the revolution in November 1918, and he ardently supported the rise of the National Socialists in the early 1930s. As a favor, he was allotted a small laboratory at the newly renamed Rudolf Hess Hospital in 1934 and later received significant federal funding for his "strategic" (*kriegswichtige*) experiments.⁴⁴⁴ In actuality, as the early support in the Third Reich for alternative medicine waned, so did his opportunities for

⁴⁴² Rummel, *Ragnar Berg*, 24, 163-190.

⁴⁴³ Rummel, *Ragnar Berg*, 142-146.

⁴⁴⁴ In 1935 and 1936, the Deutsche Forschungsgemeinschaft (DFG) granted him 61,000 RM. Rummel, *Ragnar Berg*, 30; Alexander Neumann, "Nutritional Physiology in the 'Third Reich' 1933-1945," in *Man, Medicine, and the State: The Human Body as an Object of Government Sponsored Medical Research in the 20th Century*, ed. Wolfgang U. Eckart, 49-60 (Stuttgart: Steiner, 2006), 54; Robert Proctor, *The Nazi War on Cancer* (Princeton: Princeton University Press, 1999), 54-57; Marina Lienert, "Das Rudolf-Heß-Krankenhaus in Dresden-Johannstadt—Zentrum der Neuen Deutschen Heilkunde im Dritten Reich," in *Erfahrung der Moderne*, ed. Michael Pammer, Herta Neiß, and Michael John, 209-226 (Stuttgart: Franz Steiner, 2007).

advancement. After the Allied bombing of Dresden in February 1945, Ragnar and Ella fled to Berlin and then to Stockholm, where he re-established himself among Are Waerland's (1876-1955) circle of vegetarians and those interested in prolonging the human life span. Ella died there almost ten years later of a heart attack; lonely and almost deaf, Berg eventually moved in with their older son's family north of Hamburg and finally succumbed to prostate cancer.

Scientific background: food, minerals, and physiology

From an extensive search of existing scientific literature in the 1900s, Ragnar Berg identified the following research problem: how much daily intake of minerals like iron and iodine was necessary? Some (unnamed) American surveys had calculated actual average mineral intake without considering whether this was physiologically sufficient. Further, although existing tables of food values usually included the non-combustible mineral content (*die Aschen*), few included individual minerals or noted how these changed with cooking. According to Berg, scientists knew almost nothing about mineral metabolism or how much humans needed for life and health.⁴⁴⁵ In fact,

The only thing we know for sure is that a general lack of minerals can lead to life-threatening diseases, and that deficiency of individual components is a cause of serious illness. All the more surprising is a claim ... that our mixed diet always contains more than enough nutrients; it is an assertion about which we cannot say whether it is false or true.⁴⁴⁶

Therefore, Berg conducted food analyses and created voluminous tables to address the question of mineral content in raw and cooked foods. The feeding experiments he did with Carl Röse and

⁴⁴⁵ Berg, "Über Mineralstoffwechsel," *Chem.-Ztg.* 37, no. 121 (9 Oct. 1913): 1245-1247; Berg, *Die Nahrungs- und Genußmittel, ihre Zusammensetzung und ihr Einfluß auf die Gesundheit, mit besonderer Berücksichtigung der Aschenbestandteile*, 1. Aufl. (Dresden: Holze & Pahl, 1913), 4. He frequently made this point in letters; e.g. Berg to R. Brühl, 22 Jan. 1918, doc. 167 in Kopie-Buch Nr. 5, 12650 Berg, SHAD.

⁴⁴⁶ "Das einzige, was wir mit Sicherheit wissen, ist, daß ein Mangel an Mineral-stoffen überhaupt zu lebensbedrohlichen Krankheiten führen kann, und daß Mangel an einzelnen Bestandteilen Ursachen zu schweren Erkrankungen bildet. Um so erstaunlicher ist eine Behauptung, ... daß unsere gemischte Nahrung stets mehr als genug Nährsalze enthält; dies ist eine Behauptung, von der wir nicht sagen können, ob sie falsch sei oder recht habe." Berg, "Über Mineralstoffwechsel," 1246.

Röse's son Walter (*1894), complete with daily urine and feces collection and journaling of subjective symptoms, were meant to determine physiological minima and maxima. To answer these questions, they combined physiology, food chemistry, and (alternative) clinical medicine.

Berg relied on the work of a handful of nineteenth-century scientists as much for their results as for the legitimacy their university-sponsored research lent his own theories. One of these scientists was Justus von Liebig, whose discovery in the 1840s of the physiological principle of nitrogen balance had revolutionized experimental food science by providing an internal baseline for each test subject. A dog (or human) put on a uniform diet would eventually excrete as much nitrogen as it ingested; it was then in a state of nitrogen balance. Berg extended this principle to minerals. He and Röse believed their bodies needed to be in both nitrogen and mineral balance before any dietary variables could be introduced, so they began each experimental cycle with a period of cleansing and stabilization. Both the necessity and definition of mineral balance became points of contention with mainstream nutritional physiologists like Wilhelm Hermann Jansen (1886-1959).⁴⁴⁷

Another of Berg's influences was Ernst Leopold Salkowski (1844-1923), a German biochemist at the Charité Hospital in Berlin who while working as a laboratory assistant at the University of Königsberg clinic in 1871 had carried out an investigation on the potassium and sodium content of bodily fluids from healthy and sick persons with and without fevers.⁴⁴⁸ Salkowski noted that other researchers had shown that animal bodies did not store salts like potassium and sodium: even if none were ingested with food, some would be excreted in the urine. He concluded that this loss of K^+ and Na^+ ions disturbed the animal's inorganic

⁴⁴⁷ P. Martini, "Lebensbild: Professor W. H. Jansen zum 70. Geburtstag," *MmW* 98, no. 45 (9 Nov. 1956): 1545-1546.

⁴⁴⁸ Ernst Salkowski, "Untersuchungen über die Ausscheidung der Alkalisalze," *Virchows Archiv für pathologische Anatomie* 53, no. 2/3 (1871): 209-234; "Ernst Salkowski, 1844-1923," *JAMA* 81, no. 21 (24 Nov. 1923): 1792-1792.

metabolism and negatively affected its health. Almost as an aside, Salkowski mused that perhaps it was necessary for animal bodies to be awash in mineral salts in order to maintain the osmotic pressure of bodily fluids and to neutralize the sulfur-containing acids produced by protein breakdown so these could be excreted. Berg seized upon the (incorrect) assumption that acids and bases must be balanced by each other in order to be excreted into the urine and out of the body and frequently opened his arguments for a base-rich diet with this assertion. Reaching beyond the unexplained and somewhat tenuous correlation Salkowski had made between fever states and increased potassium in patients' urine, Berg read into this one speculative article on clinical urology a far-reaching relationship between diet, mineral metabolism, and health.

Berg also frequently cited a trio of papers the US Department of Agriculture Office of Experiment Stations had published as a bulletin in 1897. Researchers at the University of Minnesota and at Wesleyan University (Conn.) had found that the surface area of peeled and cut vegetables corresponded to the leeching of nutrients during cooking.⁴⁴⁹ Operating under the pre-vitamin paradigm that valued calories and protein, they emphasized the loss of “albuminoids” and struggled to assign an importance to the ash content (minerals) of food. One article made the unsubstantiated claim that “mineral salts ... while not nutrients in the sense in which this term is frequently used, are nevertheless important in nutrition. They are of especial value, because of the potassium compounds which they contain, and are apparently necessary for health.”⁴⁵⁰ Berg often described his studies alone and with Röse as more thorough than these three but surprisingly less well-known. He also advocated boiling potatoes with their skins on, and he was much more explicit about the “nutritive value” of minerals like potash (potassium compounds).

⁴⁴⁹ Harry Snyder, “Loss of Nutrients in Boiling Potatoes, Carrots, and Cabbage”; Harry Snyder, “The Digestibility of Potatoes and Eggs”; and Almah J. Frisby and A. P. Bryant, “The Composition of Different Parts of the Potato and the Loss of Nutrients During the Process of Boiling,” in US Department of Agriculture Office of Experiment Stations *Bulletin No. 43* (Washington, DC: Government Printing Office, 1897).

⁴⁵⁰ Frisby and Bryant, “The Composition of Different Parts of the Potato,” 31.

Berg had been primed to see mineral intake as critical for health from his earliest collaborative work with Carl Röse and was further encouraged to stress acid-base balance through his affiliation with Lahmann's Sanatorium. Heinrich Lahmann had created a theory of health and sickness based on the balance of water and nutrient salts in diet. Too much water diluted bodily fluids; too much cooking salt (NaCl) concentrated them; and widespread deficient consumption of nutrient salts and bases (*Alkalien*) condemned this generation to obesity, anemia, rheumatism, and especially gout, the prototypical disease for both Lahmann and Berg.⁴⁵¹ Only a "kitchen reform" involving more fruits and vegetables properly prepared could prevent individual and collective tragedy.⁴⁵² Lahmann recommended steaming vegetables in just a little water, braising them in fat, or else using a steam pressure cooker. This would maintain their natural taste and make the addition of thirst-inducing spices and table salt unnecessary. Alternatively, those individuals who depended upon "obtuse [female] cooks who recoil from all kinds of innovation, or else on restaurant food," could balance their diets with his commercial Plant Nutrient Extract (*Pflanzen-Nährsalz-Extrakt*).⁴⁵³ Lahmann hypothesized that the reason boiled vegetables sometimes caused flatulence and other digestive difficulties was that pouring off the blanching water robbed these foods of their basic minerals, which otherwise would have bound the acids that caused fermentation and gas-production in the intestines.⁴⁵⁴

While Lahmann's body concept was rooted in bodily fluids, especially blood, the renal system was more important to Berg. He might have adopted this emphasis on the kidneys from

⁴⁵¹ On dysaemia being the root of metabolic diseases, Heinrich Lahmann, *Die diätetische Blutentmischung (Dysämie) als Grundursache aller Krankheiten*, 9. Aufl. (Leipzig: Otto Spamer, 1899), 70.

⁴⁵² "Diet reform—or more accurately kitchen reform in the practical sense—means more than prevention and cure of obesity and anemia, namely raising the constitutional vigor of the Volk." Heinrich Lahmann, *Die wichtigsten Kapitel der natürlichen (physikalisch-diätetischen) Heilweise*, 2. Aufl. der Physiatischen Blätter" (Stuttgart: A. Zimmer's Verlag [Ernst Mohrmann], 1894), 14.

⁴⁵³ "Wer von stumpfsinnigen, jeder Neuerung abholden Köchinnen abhängig, oder auf Restaurationskost angewiesen ist, kann den von uns für solche Zwecke empfohlenen Pflanzen-Nährsalz-Extrakt benützen." Lahmann, *Die wichtigsten Kapitel*, 10.

⁴⁵⁴ Lahmann, *Die diätetische Blutentmischung*, 186.

biochemist Gustav von Bunge (1844-1920), who as early as the 1870s was investigating the differences between meat- and plant-based diets and their relative concentrations of elements like potassium, sodium, and iron. These are commonly found in basic compounds (i.e. those with a high pH in solution), and by 1900 von Bunge was interested in dietary acid-base balance.⁴⁵⁵ Rather than treating food as a delivery mechanism for so many units of caloric energy, alternative researchers like von Bunge complicated the idea of “food” and its effects on the bodies that consumed it. Heinrich Lahmann and other heterodox medical practitioners quickly picked up on their laboratory results and applied them in the clinic for the prevention and treatment of illnesses such as diabetes mellitus (its acidotic coma was fatal), gout, and rheumatism (both attributed to excess uric acid). They confronted a body defined by its chemical characteristics like osmolarity and acidity and diagnosed their patients with too much acid in their bodies due to too much meat and bread in their diets. In his 1899 book for laypeople, Lahmann quoted von Bunge on the relative impact of poor nutrition on the stomach and on the kidneys:

There is no organ in the body which is treated so pitilessly as the kidneys. The stomach reacts against overcharging [with nausea and vomiting]; the kidneys must patiently suffer anything. Their diseased condition is only observed when it is too late to remedy the evil effects produced.⁴⁵⁶

In other words, the kidneys had no defense mechanism against bad health practices like eating too much meat or drinking too much alcohol. They could do no more than filter blood into urine. This necessary function had to be protected from harm, because while urinalysis was a good indicator of the interior state of the body, it was a poor indicator of the functioning of the kidneys themselves. A body concept based around the renal system’s ability to regulate levels of certain substances leant itself to a chemical understanding of the body like Berg’s that revolved around

⁴⁵⁵ Clive M. McCay, “Gustav B. von Bunge (1844-1920),” *J. Nutrition* 49, no. 1 (1 Jan. 1953): 1-19.

⁴⁵⁶ Heinrich Lahmann, *Natural Hygiene, or Healthy Blood* (Google eBook) (Swan Sonnenschein & Co, 1898), 61; orig. in Lahmann, *Die diätetische Blutentmischung*, 51.

minerals, ions, and acid-base balance.

This body had a straight-forward physiological mandate: what went in had to come out, and the kidneys were the gates between inside and outside. Berg thought that the renal system could only excrete ions (charged particles) once they had been neutralized, positive ions like calcium (Ca^{+2}) with negative ions like phosphate (PO_4^{-3}). He thought the body's usual physiological processes tended to produce more acids than bases, so it was important to consume a mineral- and base-rich diet to ensure all those metabolic end products could be removed from the body. Otherwise they accumulated in the tissues as sludge (*Schlacken*) and disrupted blood flow, nutrient and gas exchange, and other vital processes. It is somewhat counterintuitive that scientists with naturopathic leanings like Röse and Berg did not believe that animal bodies were capable of regulating their pH. Instead, they steadfastly held that nature had decreed the pH at which metabolic reactions functioned best (~7.4, slightly alkaline) and that it was incumbent on the individual to eat and drink the right things to maintain this physiological prerequisite.⁴⁵⁷

| | |
|---|--|
| Acidic foods: meat, eggs, grains, bread, butter and other fats, beer, nuts, seeds | Basic foods: potatoes, most fruits, most vegetables, milk, coffee, tea, cocoa, soy |
|---|--|

Berg developed two rules of thumb for healthy eating. The first was that “A human diet healthy over the long term must contain more binding sites (*Verbindungsgewichte*) or equivalents of inorganic bases than inorganic acids.”⁴⁵⁸ This way there would always be enough bases to neutralize whatever acids the body produced. Steeped in chemistry, it was not a very intuitive rule for laypersons. When he began popularizing his theories in the 1920s, Berg translated these unknown quantities of “binding sites” into relative amounts of whole foods:

⁴⁵⁷ “Only under maintenance of a specific composition of body fluids it is possible for the body to completely burn the supplied [i.e. dietary] or metabolized protein to carbon dioxide, water, and urea . . . , while changes in the composition of these fluids makes the oxidation more difficult.” Röse and Berg, “Ueber die Abhängigkeit des Eiweissbedarfs vom Mineralstoffwechsel,” *MmW* 65, no. 37 (10 Sept. 1918): 1011-1016, here 1012.

⁴⁵⁸ “Eine dauernd gesunde menschliche Nahrung muß mehr Verbindungsgewichte (Äquivalente) anorganischer Basen als anorganischer Säuren enthalten.” Berg, *Die Nahrungs- und Genußmittel* (1913), 6.

“One should eat five to seven times as many potatoes, roots, vegetables and fruits as all other foods, consume part of the vegetables raw every day, and drink no more than more than a pint of milk a day.”⁴⁵⁹ He did not specify how to measure one’s diet according to this plan, but whether in grams or by volume it would have contained much more plant matter than the average German’s daily food intake. Berg and his family were by this time vegetarian, although he did not begrudge others some meat and bread, as long as they balanced these acidifying components with alkalinizing ones like potatoes, spinach, and carrots.

Unfortunately, Salkowski’s assumption about the loss of ions was incorrect: human bodies do in fact regulate mineral resources such potassium, sodium, and calcium within physiological limits, which are rarely as extreme as laboratory conditions can be made (i.e. diets effectively deficient in minerals).⁴⁶⁰ In addition, Berg was unaware that biochemists and chemists were at that very moment discovering the blood pH buffer.⁴⁶¹ However, nutritionists who opposed Berg did not know these things either, at least not in the 1910s. The opposition Berg received on all fronts came less from more accurate knowledge on his opponents’ part than from their ideological and institutional biases and some combination of skepticism and inertia about adjusting their paradigm to include micronutrients as well as macromolecules. Until 1915, Berg expected the (mainstream) scientific community to accept his laboratory results on their merits, as contributions to clear lacunae in the literature. And he expected housewives and

⁴⁵⁹ “Man esse fünf- bis siebenmal so viel Kartoffeln, Wurzeln, Gemüse und Früchte wie alle andern Nahrungsmittel zusammen, esse einen Teil der Vegetabilen täglich roh und verzehre nicht mehr als höchstens einen halben Liter Milch täglich.” Berg, *Die Nahrungs- und Genußmittel, ihre Zusammensetzung und ihr Einfluß auf die Gesundheit, mit besonderer Berücksichtigung der Aschenbestandteile*, 2. Aufl. (Dresden: Emil Pahl, 1923), 63; “Vitamine und Nährsalze,” *Dresdner Anzeiger* no. 167 (9 April 1927): 3; Martin Vogel, *Ernährungsführer* (Dresden: Deutscher Verlag für Volkswohlfahrt, 1928), 56.

⁴⁶⁰ Rummel, *Ragnar Berg*, 133-140, 158-162, 198-201.

⁴⁶¹ Henry N. Po and N. M. Senozan, “The Henderson-Hasselbalch Equation: Its History and Limitations,” *J. Chem. Edu.* 78, no. 11 (2001): 1499-1503; Robert de Levie, “The Henderson-Hasselbalch Equation: Its History and Limitations,” *J. Chem. Educ.* 80, no. 2 (2003): 146; de Levie, “The Henderson Approximation and the Mass Action Law of Guldberg and Waage,” *The Chemical Educator* 7, no. 3 (2002): 132-135. Carbonic acid and bicarbonate molecules circulate in the blood to “absorb” excess protons (from acids); in conjunction with the lungs and the kidneys, they balance pH in the blood at about 7.4.

canned food manufacturers to see the error of their ways and to switch from blanching vegetables to steaming them or serving them raw. With this optimism, he carried out a large research project in time for the 1911 International Hygiene Exhibition in Dresden.

Berg's theory on display

In the spring of 1911, Berg worked feverishly to complete a series of analyses he published as *The Influence of Blanching on the Nutritional Value of our Vegetables*.⁴⁶² He began with four vegetables (spinach, Brussels sprouts, kale, white cabbage) and later expanded his tables to include a variety of common and uncommon foods.⁴⁶³ For each analysis, he steamed 1 kilogram of vegetable “according to Lahmann’s directions” and boiled 1 kilogram according to “the housewife’s usual way of doing it.”⁴⁶⁴ Then he tested the vegetables and the blanching water for their content of carbohydrates, nitrogen and protein, fat, and various minerals. Berg found that boiling leached one-third to three-fourths of all minerals out of the vegetables and into the water, and that the majority of these were important bases like potassium and sodium. Thus, even alkaline foods like spinach or potatoes could be made acidic by boiling, thereby reversing their beneficial effect on dietary acid-base balance. He concluded, “The blanching of vegetables is not just a stupid, unthinking habit, its dissemination means downright robbery of the national wealth of the nations (*Völker*).”⁴⁶⁵ That Germans were paying more money for less nutritious canned or

⁴⁶² *Der Einfluß des Abbrühens auf den Nährwert unserer Gemüsekost* (Blasewitz: Elbgau-Buchdruckerei, 1911).

⁴⁶³ Berg was not the first to publish food tables, but he maintained that his were the most complete, accurate, and practical, especially with regard to absolute amounts of various minerals. The expanded version of his *Einfluß des Abbrühens* pamphlet, *Die Nahrungs- und Genußmittel* (1913), includes values for various kinds of blood, meat, fish, milks and dry products, fats, cheeses, seeds, flours, pastas, breads, potatoes and other tubers, vegetables, legumes, fruits, nuts, mushrooms, nutritional supplements, “luxury goods” (*Genußmittel*), and drinks. So extensive was his final set of tables, completed in 1917, that he was never able to find funding to publish all 1,400 of them: Berg to Geh.-Rat Prof. Dr. R[obert] Kobert, 5 June 1917, doc. 771-774 in Kopie-Buch Nr. 4; Berg to Dipl. Ing. W. Krafft, 6 Dec. 1918, doc. 273 in Kopie-Buch Nr. 5, 12650 Berg, SHAD.

⁴⁶⁴ “Es wurde so verfahren, daß vom gleichen Material ein Kilogramm zur Zubereitung fertig gestelltes Gemüse nach Lahmann’s Vorschrift gedämpft, ein zweites nach gewöhnlicher Hausfrauenart abgebrüht wurde.” Berg, *Der Einfluß des Abbrühens* (1911), 6.

⁴⁶⁵ “Das Abbrühen der Gemüse ist also nicht nur eine törichte, gedankenlose Unsitte, es bedeutet bei deren Verbreitung geradezu einen Raub am Nationalvermögen der Völker.” Berg, *Der Einfluß des Abbrühens* (1911), 7.

over-boiled food was a crime against both economic and bodily health.

Berg made this individual and collective loss visible to visitors of the 1911 International Hygiene Exhibition in three rows of glass containers: the top row contained the nutrients from steamed vegetables, the middle those from blanched vegetables, and the bottom those left in the water that had been poured off.⁴⁶⁶ If these nutrients remained in the cooking pot, then they were not entering the body, where they were needed to maintain normal physiological conditions. Berg took it as a given that nature had designed optimal conditions for metabolic reactions. If these physiological conditions were not met, then the reactions would not run, would run poorly, or would run incorrectly—and *the organism was sick*. “Any qualitative and quantitative change in this medium will lead to a change, and indeed to a pathological change in the reactions necessary for life,” he insisted.⁴⁶⁷ According to Berg, even without a specific disease entity, the absence of normality was disease, and his range of “normal” was fairly narrow. This meant that the population of (potentially) ill persons was quite large and lent itself to the sort of collective hypochondriasis that fed the urgency behind his exhortations to cook vegetables better.

Berg remarked in frustration that mainstream textbooks stated, teleologically, that if an organism did not have enough inorganic bases, then it decomposed proteins to ammonia to neutralize the excess acids. He countered first, that this decomposition was unthinking on the part of the organism and second, that “the production of ammonia is not a protection against

⁴⁶⁶ Berg to Walter [Röse], 11 May 1911, doc. 702-703 in Kopie-Buch Nr. 3, 12650 Berg, SHAD. Having found no information about Ragnar Berg’s display outside his letters, I assume it was part of the stand for Lahmann’s Sanatorium in the industrialists’ part of Hall 13, devoted to spas and baths. He is not mentioned in connection with the display of canned goods in the building for food and drink (Hall 56). *Offizieller Katalog der Internationalen Hygiene Ausstellung Dresden Mai bis Oktober 1911*, neu verb. Aufl. (Berlin: Rudolf Mosse, 1911), 131-151, 292-312, 472; “Gemüse, Früchte und Pilze; Konserven,” in Joseph König, Adolf Schmidt, and Emil Abderhalden, *Sonder-Kataloge der Gruppe Ernährungslehre der Internationalen Hygiene-Ausstellung Dresden 1911* (Dresden: Verlag der IHA, 1911), 41-46; Maximilian Pleißner, *Sonderkatalog für die Gruppe Pflanzliche Lebensmittel und Lebensmittel-Untersuchung der wissenschaftlichen Abteilung der Internationalen Hygiene-Ausstellung Dresden 1911* (Dresden: Verlag der IHA, 1911).

⁴⁶⁷ “Jede qualitative und quantitative Veränderung in diesem Medium wird zu einer Veränderung, und zwar zu einer krankhaften Veränderung der Lebensreaktionen führen.” Berg, “Über Mineralstoffwechsel,” 1246.

alkali deficiency, but one, albeit heuristic symptom and a result of already existing base deficiency.”⁴⁶⁸ Acidic bodily pH was so important to Berg because “one can say with complete justification that gout counts among the most pervasive and wide-spread diseases (*Volkskrankheiten*).”⁴⁶⁹ Physicians already knew that excess uric acid, as measured in the urine, was related to the painful night attacks and concretions (tophi) in joints associated with gout. A diet heavy in meat and alcohol acidified the urine and could bring on an attack. Berg extrapolated from these individuals to the whole population. He saw this relationship at the sanatorium and experienced something like it in his experiments with Röse. On acidic diets they excreted more uric acid than on basic diets, even as the uric-acid solubility of their urine decreased; eventually the uric acid backed up in their bodies, causing pain and discomfort that ceased as soon as they returned to a basic diet. “The relationships proceeded with automatic certainty and could be induced arbitrarily, exactly as if I had worked with test tubes instead of with human organisms,” he stated confidently.⁴⁷⁰

Because vegetables’ nutritional worth was their alkaline minerals—“and maybe also unknown substances, vitamin-like or otherwise”—Ragnar Berg entered the lists against the German canning industry.⁴⁷¹ Many different populations depended on canned vegetables for part or all of their vegetable intake, particularly in winter and early spring: city dwellers, sailors, those in residential institutions, militaries, and scientific expeditionists to inhospitable locales. Both the Bulgarian army in 1912 and the last several polar expeditions had come down with the

⁴⁶⁸ Berg: “die Ammoniakproduktion ist nicht ein Schutz gegen Alkalimangel, sondern ein, wenn auch heuristisches Krankheitssymptom und eine Folge von schon bestehendem Basenmangel.” “Über Mineralstoffwechsel,” 1246.

⁴⁶⁹ “Die Gicht kann man mit vollem Recht zu den am weitest verbreiteten Volkskrankheiten zählen.” Berg, “Beitrag zur Kenntnis der Entstehung der Arthritis,” *MmW* 61, no. 23 (9 June 1914): 1275-1278, here 1275.

⁴⁷⁰ “Die Verhältnisse gingen mit automatischer Sicherheit vor sich und konnten beliebig hervorgerufen werden, genau als ob ich im Reagenzglas statt mit menschlichen Organismen gearbeitet hätte.” Berg, “Beitrag zur Kenntnis der Entstehung der Arthritis,” 1277.

⁴⁷¹ “Die Gemüsearten, deren Nährwert ja oft sehr gering ist, sind uns besonders durch ihren Gehalt an Basen, vielleicht auch an unbekanntem, sei es vitaminähnlichen oder anderen Substanzen wertvoll.” Ragnar Berg, “Das Blanchieren der Gemüse,” *Zeitschrift für angewandte Chemie* 27, no. 20 (1914): 148-152, here 151.

dietary deficiency disease of scurvy, despite having canned vegetables on the trip. Therefore, the fault must have been in the manufacturing process that relied on blanching.⁴⁷² With the facts so clearly displayed before them, Berg expected the canning industry to subordinate business and technological concerns about steaming to the overriding good of health.

Controversy with the canning industry, 1900s-1910s

Ragnar Berg's first public scuffle with the canning industry came in 1913, but it was not the first time manufacturers had considered the impact of nutritional science on their industry. About the time Röse and Berg began publishing their experimental results in scientific venues, trade journals like *Konserven-Zeitung* were hosting pieces about how to manufacture canned goods with a minimum loss of color, taste, aroma, or nutrients.⁴⁷³ You can read a typical canning method in the first recipe at the start of the chapter; its steps include both parboiling loose peas in a large kettle and sterilizing the filled cans in a hot water bath. One debate revolved around whether to pre-cook by blanching or steaming. "When pre-cooking vegetables," wrote an interested party who signed himself W. S., "a portion of their taste and smell substances [goes] into the blanching water, and these are the most easily soluble substances, which is to say, the most digestible to the human stomach."⁴⁷⁴ Not only did steaming with his easy-to-use apparatus avoid the loss of those substances, but it was less likely to produce a mushy product. However, a (presumably) different W. S. answered a reader's question about cooking asparagus that steaming boiled the water in the plant cells, which then burst, leading to a product that was too

⁴⁷² Berg, *Alltägliche Wunder*, 22-24.

⁴⁷³ E.g. Dr. Josef Ott, "Über das Blanchieren von Gemüsen," *Konserven-Ztg.* 9, no. 3 (17 Jan. 1908): 33; "Der Einfluß der Konservierung des Spinats auf Gehalt an Nährsalzen. Arbeit aus unserer Versuchsstation," *Konserven-Zeitung* 9, no. 23 (6 June 1908): 352-353.

⁴⁷⁴ "Mit anderen Worten, es geht beim Vorkochen der Gemüse ein Teil der Geschmack- und Geruchstoffe derselben in das Blanchierwasser über, und sind dieses die leicht löslichsten Stoffe, also dem menschlichen Magen die bekömmlichsten." W. S., "Einige Momente beim Gemüsedörren," *Konserven-Ztg.* 9, no. 20 (15 May 1908): 304. Continued as "Eine einfache Vorrichtung zum Dämpfen der Gemüse," *Konserven-Ztg.* 9, no. 24 (13 June 1908): 368.

soft and overcooked (*zerkocht*).⁴⁷⁵ So there was no consensus that blanching and boiling made a higher-quality canned good than steaming did.

While the unappetizing effects of boiling on the quality of vegetables were widely known, most objections to steaming in the canning industry were financial, as a question and answer thread in September and October 1908 demonstrates. R. asked his fellow readers what they thought of blanching versus steaming; he and his partners had recently conducted some test runs and decided on steaming.⁴⁷⁶ To support his assertion that scientifically, steaming was without a doubt better, W. G. included a table showing mineral losses from boiled and steamed potatoes, peeled and unpeeled, reminiscent of Snyder, Frisby, and Bryant's. The problem was that to be competitive, steamed canned goods had to be sold at the same price as conventional canned goods, and blanching was undoubtedly cheaper. "Nowadays innovation is aimed primarily at the cheapening of manufactured goods," he grumbled, "and the quality of the product comes into consideration only secondarily."⁴⁷⁷ X. Z. countered that "at all modern canning facilities" the vegetables were blanched, not steamed. In an age when economy of time and money was so important, why would anyone go back to a procedure that the industry had left behind, since its positives did not outweigh the negatives?⁴⁷⁸ W. v. S. chimed in to recommend W. S.'s steaming apparatus, and the editors let J. in G. have the last word: "At this station we

⁴⁷⁵ J. G., "Anfragen an den Leserkreis. Frage 88. Blanchieren und Sterilisieren," *Konserven-Ztg.* 9, no. 26 (27 June 1908): 404; W. S., "Sprechsaal. Antw. a. Fr. 88. Blanchieren und Sterilisieren," *Konserven-Ztg.* 9, no. 29 (17 July 1908): 453; J., "Sprechsaal. 2. Antw. a. Fr. 88. Blanchieren und Sterilisieren," *Konserven-Ztg.* 9, no. 32 (7 Aug. 1908): 504.

⁴⁷⁶ R., "Anfragen an den Leserkreis. Frage 124. Dämpfen oder Blanchieren," *Konserven-Ztg.* 9, no. 38 (18 Sept. 1908): 607.

⁴⁷⁷ "Das Streben der Jetztzeit richtet sich in erster Linie auf Verbilligung aller Fabrikate, in zweiter Linie kommt erst die Güte des Produktes in Betracht." W. G., "Sprechsaal. Antw. a. Fr. 124. Dämpfen oder Blanchieren," *Konserven-Ztg.* 9, no. 40 (2 Oct. 1908): 640.

⁴⁷⁸ X. Z., "Sprechsaal. 2. Antw. a. Fr. 124. Dämpfen oder Blanchieren," *Konserven-Ztg.* 9, no. 41 (9 Oct. 1908): 656-657.

prefer steaming vegetables to blanching them, as this way the nutrient salts are conserved.”⁴⁷⁹

Despite any potential financial disadvantage, then, some canners chose the more expensive if more aesthetic and nutritionally responsible route of steaming rather than blanching.

One of the canners who rejected blanching was Arthur Huch of Braunschweig, who had recently patented a steam canning procedure in Germany and the United States.⁴⁸⁰ Huch’s idea was to sterilize canned vegetables by packing them with just a centimeter or two of water or flavored liquid in a double-bottomed tin can, possibly with an absorbent liner of cotton, paper, asbestos, porous clay, or sea sponge.⁴⁸¹ When the cans were heated in an autoclave or hot water bath, the liquid would turn to steam, cooking and sterilizing the contents. When the cans cooled, the liquid would condense in the bottom of the can again. In his American patent application, Huch gives seven reasons in favor of his steam-cooked canned goods, which I summarize as the following:

1. To sterilize fruits and vegetables that cannot be canned by other means.
2. To preserve taste, which otherwise degenerates as the fruit sits in the water.
3. To prevent vegetables like peas from gelling into an unappetizing sodden mass.
4. To be able to use cheaper tin cans when steaming instead of more expensive glass jars necessary to handle the higher internal pressures when boiling.
5. To save money on fuel, because only the can contents need to be brought to boiling instead of huge blanching kettles full of water.
6. To save money on transportation, since each can has less water weight.
7. Finally, he claims—vaguely—“the foods preserved in the manner above described are of a superior quality by reason of having been cooking in steam, as their valuable and tasty ingredients are not destroyed by water.”⁴⁸²

In short, Huch proposed an improved canned good for both producers and consumers, one that

⁴⁷⁹ “Wir geben an der hiesigen Station dem Dämpfen der Gemüse vor dem Blanchieren den Vorzug, da hierdurch die Nährsalze etc. mehr erhalten bleiben.” W. v. S., “Sprechsaal. 3. Antw. a. Fr. 124. Dämpfen oder Blanchieren,” *Konserven-Ztg.* 9, no. 42 (16 Oct. 1908): 674; J. in G., “Sprechsaal. 4. Antw. a. Fr. 124. Dämpfen oder Blanchieren,” *Konserven-Ztg.* 9, no. 43 (23 Oct. 1908): 691.

⁴⁸⁰ Arthur Huch, Verfahren zur Herstellung in Dampf gekochter Konserven, German Patent 200,182, filed 28 July 1906, and issued 9 July 1908.

⁴⁸¹ “Aus Praxis und Wissenschaft. Konservierungsverfahren,” *Konserven-Ztg.* 9, no. 17 (24 April 1908): 257.

⁴⁸² Arthur Huch, Process of preserving fruits or vegetables, US Patent 909,600, filed 22 July 1907, and issued 12 Jan. 1909; *Official Gazette of the United States Patent Office*, vol. 138, no. 2 (12 Jan. 1909): 418.

considered both individual health and the bottom line. (Almost a decade before World War I massively re-oriented health campaigns away from individual to national well-being, it is unsurprising he made no mention of collective health.) Laypeople engaged as taste-testers had even consistently rated his canned goods as almost as tasty as fresh vegetables. Huch blamed his difficulty in establishing his own factory on industry insiders resistant to change or competition; his critics countered that an insufficient profit margin was holding him back, not some kind of secret oligarchic agreement.⁴⁸³ The purported increase in quality did not justify the increased cost.

Living in Braunschweig, Huch missed Berg's contribution to the 1911 International Hygiene Exhibition in Dresden, but in 1913 he read about Berg's paper at the 88th Meeting of German Scientists and Physicians (21-28 Sept. 1913) in Vienna and hired Berg to analyze some of his canned goods.⁴⁸⁴ Berg compared Huch's canned peas and spinach to those of competitors, every time concluding that the steam-cooked vegetables contained more mineral salts, especially basic ones like potassium oxide (K₂O) and magnesium oxide (MgO).⁴⁸⁵ The two men exchanged few letters but supported each other in the press. About this time Berg wrote to his friend and former boss, Professor Ernst von Düring (1858-1944), about his work comparing the nutritional content of different brands of canned goods: "I will then bring these analyses in parallel with those that I have already conducted on the Huch products, and see if it is possible to bring the canning industry back to sensible ways. Up to now I can demonstrate tremendous differences

⁴⁸³ K., "Aus Praxis und Wissenschaft. Das Gelieren von Erbsen," *Konserven-Ztg.* 13, no. 52 (27 Dec. 1912): 412; A. H., "Das Gelieren von Erbsen," *Konserven-Ztg.* 14, no. 2 (10 Jan. 1913): 11-12; K., "Das Gelieren von Erbsen (Entgegnung.)," *Konserven-Ztg.* 14, no. 4 (24 Jan. 1913): 28; A. H., "Das Gelieren der Erbsen und das Huchsche Konservierungsverfahren. (Erwiderung.)," *Konserven-Ztg.* 14, no. 6 (7 Feb. 1913): 46.

⁴⁸⁴ Berg published a summary in six different publications, hoping for a broader and more positive reception than the one he faced in Vienna. Berg, "Über Mineralstoffwechsel"; Berg to August Borosini von Hohenstein, 5 Oct. 1913, doc. 23-24 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

⁴⁸⁵ Berg to Arthur Huch, 22 Oct. 1913, doc. 30-31 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

with leeching of about 81% [between steamed and blanched products]!”⁴⁸⁶

Interestingly, it was not his direct publishing activities but an unsolicited favorable review in the *Konserven-Zeitung* that brought Berg to the attention of the rest of the canning industry. In a January 1914 summary of recent literature on nutritional physiology and its importance for the food industry, W. approvingly cited Berg’s recent *Chemiker-Zeitung* article arguing for a diet richer in alkaline constituents than acidic ones.⁴⁸⁷ Berg sent in a follow-up essay, which was not published. Instead, a refutation by C. appeared.⁴⁸⁸ C. charged that Berg had merely repeated the work of Dr. Kochs and come to the same conclusions as Snyder, Frisby, and Bryant, although he admitted that Berg’s measurements on canned meat and fish were new.⁴⁸⁹ C.’s most damning criticism was that Berg already knew the conclusions he would reach, because his publications were mere propaganda for Huch’s process, which hadn’t been proven yet and would be difficult to implement. The charge that Berg was merely a hired hack and not an objective scientist stung him deeply. Huch wrote in to defend Berg for openly criticizing the canning industry and to demand his critics both give their names and explicitly state the “difficulties” in implementing a process that Huch had tested on thousands of canned goods.⁴⁹⁰

Altogether, the exchanges in the *Konserven-Zeitung* show that the canning industry was not monolithically opposed to “qualitative nutritional” ideas like Berg’s. At least some manufacturers had begun to abandon blanching before Berg started his campaign, and they were at least as

⁴⁸⁶ “Ich will dann diese Analysen mit denen in Parallele bringen, die ich schon von den Huch-schen Fabrikaten ausgeführt habe, und versuchen, ob es möglich ist, die fortgeschrittene Konservenfabrikation wieder auf vernünftige Wege zu bringen. Bis jetzt habe ich fürchtbare Unterschiede nachweisen können, Auslaugerungen von etwa 81%!” Berg to Liebster Herr Professor [Ernst v. Düring], 3 Nov. 1913, doc. 35 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

⁴⁸⁷ W., “Neuere physiologische Forschungen und ihre Bedeutung für die Nahrungsmittelindustrie,” *Konserven-Zeitung* 15, no. 2 (9 Jan. 1914): 9-10.

⁴⁸⁸ C., “Das Blanchieren von Konserven,” *Konserven-Ztg.* 15, no. 11 (13 March 1914): 28.

⁴⁸⁹ Prof. Dr. Julius Kochs (1872-1945) was head of the Kgl. Gärtnerlehranstalt (later Obst- und Gemüseverwertungstation an der Lehr- und Forschungsanstalt für Gartenbau) at Dahlem outside Berlin and sometimes published in the *Konserven-Zeitung*. He showed that blanching time and loss of minerals were directly related to one another. Kochs, “Vergleichende Untersuchungen hinsichtlich des Verlustes von Bestandteilen verschiedener Gemüsearten beim Blanchieren in Wasser oder Dämpfen,” *Konserven-Ztg.* 12, no. 25 (23 June 1911): 299-300.

⁴⁹⁰ Arthur Huch, “Das Huchsche Konservierungsverfahren,” *Konserven-Ztg.* 15, no. 13 (27 March 1914): 102-103.

likely to adopt steaming for reasons of taste, appearance, and (later) vitamins as for mineral loss or acid-base balance. Interestingly, by the 1920s Huch had changed his position. In his later German, British, and French patents, he no longer judged the quality of a canned good by its content of “nutrient salts.”⁴⁹¹ These patents give only two reasons in favor of a new sterilization procedure: using lower, pasteurization temperatures to preserve foods instead of destroying their “vitamines or albumens” through boiling; and extending the sterilization time, so the finished products would keep for months instead of 1-3 days. The patents mention neither minerals nor steaming. Even more interestingly, Huch’s co-author was Dr. Hermann Serger, by then the head of the Experiment Station that had originated the *Konserven-Zeitung*.⁴⁹² From the beginning Serger had rejected Huch’s original steaming technique as “a failure” (*Fehlschlag*) due to technical difficulties. But Berg stubbornly continued to oppose Serger in scientific and trade journals over the question of whether losses from blanching and boiling were “negligible.”⁴⁹³ He refused to acknowledge that the practice of steaming was good but his theory about acid-base balance was bad.

Canned goods and the people’s health during the war

The skepticism that had greeted his presentation at the conference in Vienna in 1913—and Max Rubner’s refusal to answer any of his letters—surprised Berg.⁴⁹⁴ He was sure that the subjective and objective evidence from his experiments with the Rösés, the tables of data from

⁴⁹¹ Arthur Huch and Hermann Serger, Verfahren zur Herstellung von Dauerkonserven, German Patent 418,416, issued 24 Aug. 1922; Arthur Huch and Hermann Serger, Procédé pour préparer les conserves, French Patent 576,243, filed 24 Jan. 1924, and issued 8 May 1924; Arthur Huch, Improvements in or relating to the Manufacture of Preserved Foods, British Patent 239,260, filed 29 Feb. 1924, and issued 31 Aug. 1925.

⁴⁹² The *Konserven-Zeitung* was published from Braunschweig (1900-1912) and Leipzig (1912-1916). Hermann Serger and Bruno Hempel published a rival publication from Braunschweig, *Konserven-Industrie* (1914-1930.)

⁴⁹³ Whether and how to boil ragoon beans (a variety of lima beans that must be blanched to remove traces of cyanide) sparked an exchange between Serger and Berg that recapitulated their contentious history: Berg, “Rangoonbohnen als menschliches Nahrungsmittel,” *Chemiker-Ztg.* 45, no. 101 (23 Aug. 1921): 809; Serger, “Rangoonbohnen als menschliches Nahrungsmittel,” 809; Berg, “Das Abbrühen von Nahrungsmitteln”; Serger, “Das Abbrühen von Nahrungsmitteln,” *Chemiker-Ztg.* 45, no. 134 (8 Nov. 1921): 1080 and Berg’s reply under the same heading.

⁴⁹⁴ Berg to Prof. Dr. [Ernst] Lassar-Cohn, 9 Nov. 1917, doc. 779-782 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

his food investigations, and his clinical experience at the sanatorium met all the requirements of “science” and that he would be accepted as a colleague among the country’s leading nutritionists, if not among its medical men. His pride and ambition hoped for (and expected) as much. World War I was therefore a mixed blessing for Berg. The conflict drove away the sanatorium’s international clientele, hurting it financially and drastically reducing Berg’s budget for assistants and supplies. A fire in the laboratory in at the end of December 1914 caused another setback.⁴⁹⁵ Yet the armed conflict provided a context and a national audience for Berg’s theories: massive casualties and an artificial famine threatened the Volk, but if they would eat what and how he suggested, they could hold out to win the war.

Via correspondence, presentations, and personal visits, Berg attempted to influence food policy on local and national levels. He wrote to the German Agricultural Council (*Deutscher Landwirtschaftsrat*) in Berlin; to Lieutenant General Wilhelm Gröner (1867-1939), then in Berlin at the War Food Office (*Kriegsernährungsamt*, KEA); to a confidante of General Paul von Hindenburg; and after the war to Georg Gradenauer (1866-1946), a Saxon newspaper editor and politician.⁴⁹⁶ Had they heard of his research? Here were some off-prints. Would they like more details? He would be happy to schedule an in-person meeting. In an eight-page letter to Paul Eltzbacher (1868-1928) in January 1915, Berg laid out his acid-base theory with laboratory results and anecdotes and summed up his relationship to the canning industry as one of science versus empiricism, progress versus inertia:

⁴⁹⁵ During an overnight analysis of Volkmar Klopfer’s whole grain bread, a container of ether had broken, caused an electrical explosion of the warming plate, and set off a chain of chemical reactions and combustion of flammable materials that, miraculously, had burned only Berg’s desk and the shelves above it. Berg to Lieber Herr Hofrat [Carl Röse], 5 Jan. 1915, doc. 268-271; and Berg to Dr. Volkmar Klopfer, 6 Feb. 1915, doc. 291-296 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

⁴⁹⁶ Berg to the Deutscher Landwirtschaftsrat, 25 April 1917, doc. 641 in Kopie-Buch Nr. 4; Berg to Gröner, 25 May 1917, doc. 59 in Kopie-Buch Nr. 5; Berg to Frau Baronin, 22 May 1917, doc. 654 in Kopie-Buch Nr. 4; Berg to Frau Baronin, 31 May 1917, doc. 66 in Kopie-Buch Nr. 5; Berg to Generalleutnant Gradenauer, 11 Feb. 1919, doc. 324 in Kopie-Buch Nr. 5, 12650 Berg, SHAD.

First I would like to point out that the canning industry stands as one man against my recommendations. This is not because it would be a little harder or more cumbersome to make canned goods directly without their having been previously boiled but only because the canning industry is an entirely empirical industry and as such fights tooth and nail against every innovation. The heads of these industries are never physiologists, and one cannot therefore demand that they assess the influence of the way the food is prepared on the health of consumers. ... Only pressure from authoritative quarters would be able to create change here and thereby save the German people the millions of Marks worth of food and its incalculable health value that is now being poured down drains and the worth of which can only be appreciated by someone who has first tracked the analytical and clinical effects of food preparation on health.⁴⁹⁷

Berg cast himself as a lone reformer standing up to a mercenary food industry, an experienced scientist who could save both the economy and the health of the German nation. As a nutritionist to an economist, Berg had many suggestions and corrections to the report issued in Eltzbacher's name on behalf of a group of experts that had included both Hedwig Heyl and Max Rubner.⁴⁹⁸

With the collapse of German agriculture and food imports, vegetables were prevalent on kitchen tables on the home front, and canned goods often provided the only source of them for inmates, soldiers, and sailors.⁴⁹⁹ Berg and his supervisor, Dr. Heinrich Kraft (1867-1944), used these practical, wartime concerns to lobby for a base-rich diet and to promote steaming of vegetables.⁵⁰⁰

⁴⁹⁷ "Zunächst möchte ich darauf hinweisen, dass die Konservenindustrie, geschlossen wie ein Mann, gegen meine Vorschläge stehen. Es hat nicht seinen Grund darin, dass es etwas schwerer oder mühsamer wäre, Konserven direkt einzumachen, ohne dass man sie vorher abgebrüht hat, sondern ausschliesslich darin, die [sic] die Konservenindustrie eine ganz empirische Industrie ist, und sich als solche mit Händen und Füßen gegen jede Neuerung wehrt. Die Leiter dieser Industrie sind ja niemals Physiologen, und man kann deshalb auch nicht verlangen, dass sie die Folge die Zubereitung der Nahrungsmittel, für die Gesundheit der Konsumenten abzuschätzen vermögen. ... Erst ein Druck von massgebender Seite würde hier Änderung schaffen können, und damit dem deutschen Volke Millionenswerte an Nahrungsmitteln, die jetzt in die Gosse fliessen, und unberechenbare Gesundheitswerte retten, deren Wert nur der zu schützen versteht, der sie erst im grossen analytisch und klinisch die Wirkungen der Zubereitung auf die Gesundheit verfolgt hat." Berg to Eltzbacher, 4 Jan. 1915, doc. 12-19 in Kopie-Buch Nr. 5, 12650 Berg, SHAD.

⁴⁹⁸ Paul Eltzbacher, ed., *Die deutsche Volksernährung und der englische Aushungerungsplan* (Braunschweig: Friedrich Vieweg & Sohn, 1914).

⁴⁹⁹ Berg, *Alltägliche Wunder*, 21-22.

⁵⁰⁰ Prof. Dr. Heinrich Kraft, "Rationelle Gestaltung der Ernährung," doc. 26-32, Nr. 23197 Lebensmittelversorgung im Kriegsjahr 1917 Allgemeines, 10736 Ministerium des Innern, SHAD; and doc. 18-23, Frh. Teich and Kraft, "Musterspeisezettel für Kriegsküchen auf 4 Wochen" (Dec. 1916), Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD. Also p. 13, Niederschrift über die 15. Sitzung des Ernährungsbeirats vom 4 Jan. 1917, doc. 80-91; p. 10, Niederschrift über die 16. Sitzung des Beirats für Volksernährung am 18 Jan. 1917, doc. 92-101; and p. 13, Protokoll über die 24. Sitzung des Ernährungsbeirats am Freitag, den 14 Sept. 1917, doc. 232-241, in Nr. 23190

According to them, blanching not only drained the economy but also the human material necessary for the war effort. Berg frequently referred his correspondents and other readers to a report in the *Memos from the War Food Office (Mitteilungen von dem Kriegsernährungsamte)* from a physician troubled by his patients' sudden decline in health. The way Berg recounted it later, when the physician inquired around the field hospital about why their wounding-healing had slowed, he learned that a new contingent of soldiers from southern German regiments had complained about the strong taste of the vegetables, which had been steamed to the liking of the previous, northern German soldiers. The cooks had acquiesced and begun boiling the vegetables. The soldiers were happier but the physician was not. When he insisted that the cooks go back to steaming the vegetables, the soldiers' wounds healed quickly. Although Berg had remembered most of the details incorrectly, the gist of the story remained the same: boiled vegetables are bad for healing bodies.⁵⁰¹

Despite the precariousness of the wartime situation, Berg was pleased with the country's overall nutritional status. Grain rations were higher than he might have wished (bread was acidic), but in general Germans were eating less meat (acidic) and more potatoes and vegetables (both basic). He greeted with approval the medical community's (falsely) optimistic reports about the hunger blockade leading to less gout and diabetes. Because he could overlook the diarrhea caused by the unfamiliar diet, the strangulated hernias and amenorrhea attributed to the

Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD. Kraft sat on the Nutrition Council that advised the Saxon parliament.

⁵⁰¹ Berg, *Alltägliche Wunder*, 34-35. The story originally involved tuberculosis patients in Alberschweiler, Alsace-Lorraine, in 1902, who protested against dishes prepared "the northern German way," presumably steamed. So the sanatorium trained a nurse to cook vegetables "the Alsatian way": boiled in salted water, drained, and served with a fat. When the patients began losing weight on this diet, the physician finally tried supplementing the now-defective dishes with Lahmann's Plant Nutrient Extract with success. However, he was also of the opinion that many vegetables were not cooked long enough to be digestible, which opinion Berg definitely did not share! Dr. Stoessner, "Die Verdaulichkeit der Speisen abhängig von der Zubereitungsart," *Mitteilungen v.d. Kriegsernährungsamte* Bd. 2, no. 6 (1917): 3-4. Berg had recommended the article in letters to his friend Konstantin von Kügelgen, 25 April 1917, doc. 639-640; to the Deutscher Landwirtschaftsrat, 25 April 1917, doc. 641 in Kopie-Buch Nr. 4; and to Geheimrat Prof. Dr. Friedrich Georg Renk, 20 Jan. 1919, doc. 298-299 in Kopie-Buch Nr. 5, 12650 Berg, SHAD.

lack of fat, and the increased spread of tuberculosis—which he argued was a disease of poverty and not of nutrition—Berg concluded that Germans’ health had actually improved on an alkaline, low-calorie diet.⁵⁰² He viewed this rosy picture as collective evidence of the correctness of his theories, just as his feeding experiments with Röse provided individual proof.

If Berg and Röse had been largely ignored before the war, now they were finally garnering attention from scientists, policymakers, and the public. But the official approbation was fleeting. Munich physiologist and physician Wilhelm H. Jansen protested that this attention was only because of the current anxiety about the population’s nutrition and not at all based on the merits of their theories.⁵⁰³ Between 1917 and 1919, Jansen published data contradicting their assertion that an alkaline diet improved the body’s ability to utilize both proteins and calories. Max Rubner agreed with Jansen’s methodology and results, which he promoted to the War Food Office, and Berg’s appearances in Berlin ended with the war.⁵⁰⁴ With his access to mainstream scientific channels essentially closed, Ragnar Berg continued in the early 1920s to send pieces to friendly scientific journals, like *Chemiker-Zeitung*, *Biologische Heilkunde*, and *Der Naturarzt* while concentrating more of his energies on educating the public, especially housewives. “I perceive my main goal as the dissemination of knowledge about healthy nutrition to the broadest audience,” he wrote to an inquirer.⁵⁰⁵ While he would have appreciated professional advance-

⁵⁰² Röse and Berg, “Ueber die Abhängigkeit des Eiweissbedarfs vom Mineralstoffwechsel.”

⁵⁰³ W. H. Jansen, “Zur Frage über die Abhängigkeit des Eiweißbedarfs vom Mineralstoffwechsel. (Bemerkung zu der Mitteilung von Hofrat Dr. C. Röse und Ragnar Berg in no. 37 dieser Wochenschrift),” *MmW* 65, no. 40 (1 Oct. 1918): 1112.

⁵⁰⁴ It is difficult to compare their experiments, because they could not agree upon what constituted the physiologically normal baseline. Rummel, *Ragnar Berg*, 24; W. H. Jansen, “Untersuchungen über Stickstoffbilanz bei kalorienarmer Ernährung,” *Dtsch. Arch. klin. Med.* 124, no. 1-2 (1917): 1-37; Berg to Jansen, 14 Feb. 1918, doc. 844-849 in Kopie-Buch Nr. 5, 12650 Berg, SHAD; Röse and Berg, “Ueber die Abhängigkeit des Eiweissbedarfs vom Mineralstoffwechsel”; Jansen, “Zur Frage über die Abhängigkeit des Eiweißbedarfs vom Mineralstoffwechsel”; Berg, “Untersuchungen über den Mineralstoffwechsel. VII.,” *Ztschr. klin. Med.* 88 (1919): 175-220; Jansen, “Zur Frage der Abhängigkeit des Eiweißstoffwechsels vom Säure-Basengehalt der Nahrung,” *Z. klin. Med.* 88 (1919): 221-259.

⁵⁰⁵ “Als meine Hauptaufgabe betrachte ich ja die Verbreitung der Kenntnisse von einer gesunden Ernährung in die breitesten Schichten.” Berg to Rudolf Schiller, 8 March 1924, doc. 436 in Kopie-Buch Nr. 6, 12650 Berg, SHAD.

ment, Berg was more concerned about reaching potential end-users of his knowledge by creating a direct conduit from his laboratory to their kitchens, bypassing the clinic altogether.⁵⁰⁶

From Berg's laboratory to private kitchens, 1920s

Berg attempted to assimilate what were alternately called “vitamines” and “complementary substances” (*Ergänzungsstoffe*) into his body concept centered on pH. In a typical display of hubris, he coined his own term, *Kompletin*, to reflect their roles in “completing” a diet. In books, public lectures, and private letters, he tied his existing theories about minerals to these new nutritional wonder-substances.⁵⁰⁷ Among other misinformation, Berg came to the curious conclusion that even vitamins could not function in an acidic environment. “It is therefore the bases especially that have the largest importance for health,” he decided.⁵⁰⁸ This assertion is rarely found in sources by other authors, but the idea that alkaline vegetables should balance acidic meat in a healthy diet often was.

Between local lectures, books, and his commercial food supplement Basica®, Berg increased his public profile in the 1920s.⁵⁰⁹ His greatest publicity came through the German Hygiene-Museum. He began by collaborating with Science Director Martin Vogel to publish a 200-page book on nutrition for interested lay persons, doctors, teachers, and clinic administrators.⁵¹⁰ Although illustrated with diagrams and pictures from the Museum's slide collection, it represented the opinions of the two authors and not of the Museum. Berg wrote the scientific sections on the biochemistry and physiology of digestion that took up most of the book, while

⁵⁰⁶ It would be particularly fruitful to pursue Berg's correspondence with patients seeking laboratory analyses, diagnoses, and recommendations for dietary treatments. See e.g. letters to Prof. Dr. Kurt A. Gerlach, Kiel, Kopie-Buch Nr. 5, or Ernst and Ilse Foerster in Hamburg-Altona in Kopie-Bücher Nr. 6-7, 12650 Berg, SHAD.

⁵⁰⁷ Berg, *Alltägliche Wunder*, 19-20.

⁵⁰⁸ “Ganz besonders sind es dabei die Basen, die für die Gesundheit die größte Wichtigkeit besitzen.” Berg, *Alltägliche Wunder*, 28. Berg also claimed that acidic metabolic by-products, if not bound by bases and excreted by the kidneys, would precipitate in the body tissues and “very quickly literally choke off life.” Pp. 25-26.

⁵⁰⁹ On Basica®, Rummel, *Ragnar Berg*, 142-146.

⁵¹⁰ Ragnar Berg and Martin Vogel, *Die Grundlagen einer richtigen Ernährung*, 1-7. Aufl. (Dresden: Deutscher Verlag für Volkswohlfahrt, 1925-1930).

Vogel covered the medical and social aspects.

Unsurprisingly, Berg denounced the evils of boiled vegetables and of canned goods for individual and collective health. However, he did have to admit that some manufacturers had switched from blanching vegetables to steaming them for five minutes before filling the cans for sterilization. But because the cans were still topped off with water that housewives generally discarded on the manufacturers' recommendation,⁵¹¹ the rejection of blanching still was not good enough for him. Giving no specific experimental results, he claimed the pH of these products could turn from basic to alkaline. To rectify the situation, Berg wanted vegetables (and fruit) preserved in their own juice according to his instructions. An appendix at the end of the book even listed nine different manufacturers of "unobjectionable" or "impeccable" (*einwandfrei*) canned produce, from the Eden Colony at Oranienburg outside Berlin to W. L. Ahrens in Braunschweig. So it was possible for Germans to eat canned goods of which Ragnar Berg approved, but he gave these businesses short shrift in his text.

Despite Berg's difficulties with the scientific and canned-good establishment, both the vegetable preparation practices he promoted and his underlying acid-base theory found acceptance among domestic scientists and other authors writing for German housewives, because these two things could be easily assimilated with understandings of vegetables and their micro-nutrients that alternative researchers like von Bunge and Lahmann had promoted through the life reform movement.⁵¹² As early as the 1870s, specialty cookbooks cautioned cooks that blanching vegetables or letting them soak too long would leech "the valuable nutrient salts" (*die wertvollen*

⁵¹¹ E.g. Henriette Davidis and Luise Holle, *Praktisches Kochbuch für die einfache und feinere Küche*, 60. Aufl. (Bielefeld & Leipzig, Velhagen & Klasing, 1935), 562-563.

⁵¹² One of the most successful entrepreneurs to capitalize on this idea was Friedrich Eduard Bilz, who sold a line of "nutrient salt supplements" and food products. Bilz, "Nährsalze und deren Bedeutung," *Das neue Naturheilverfahren. Lehr- und Nachschlagbuch der naturgemäßen Heilweise und Gesundheitspflege*, 93. Aufl. (Leipzig: F. E. Bilz & Frankenstein & Wagner in Leipzig, [c. 1900]), 582-583.

Nährsalze) into the water.⁵¹³ These warnings subsequently appeared in popular cookbooks like Davidis-Holle's alongside the usual instructions for boiling vegetables in salted water, as if to acknowledge that housewives could make the lifestyle choice not to blanch produce.⁵¹⁴ And advertisements for vegetable steamers could be found already in women's magazines before World War I: "No nutrient salts are lost" with the aluminum contraption available from E. Nimsch's shop in central Dresden, claimed one.⁵¹⁵ But by the 1920s, blanching produce had become the "wrong" choice, a matter of conventional wisdom rather than a personal preference.

During the war, authors in the *Dresdner Hausfrau*—in an attempt to reduce kitchen and nutritional waste and to win the war on the home front—had frequently suggested women steam vegetables, cook potatoes unpeeled, and reuse the boiling water in soups.⁵¹⁶ One author called the soup suggestion, found in many cookbooks, "roundabout" and recommended the southern German style of braising the vegetables in fat (if any was to be had, of course).⁵¹⁷ In 1917 a particularly prescient reader wrote in with advice about minimizing the use of cooking salt (NaCl) and maximizing the retention of mineral salts that sounds as though it could have come directly from Prof. Dr. Kraft or Ragnar Berg.⁵¹⁸ Otherwise, injunctions against blanching were couched in terms of nutrients salts, and occasionally protein or taste, until 1925.⁵¹⁹

Vitamins and then minerals supplemented though never replaced the term "nutrient salt," which cookbook authors and advice givers continued to use, sometimes as a synonym for

⁵¹³ Josef Wiel, *Diätetisches Koch-Buch mit besonderer Rücksicht auf den Tisch für Magenkranke*, 6. Aufl. (Freiburg i. B.: Wanger, 1886).

⁵¹⁴ Henriette Davidis and Luise Holle, *Praktisches Kochbuch für gewöhnliche und feinere Küche. Unter besonderer Berücksichtigung der Anfängerinnen und angehenden Hausfrauen*, 39. Aufl. (Bielefeld & Leipzig: Velhagen & Klasing, 1901), 77-81, 770-771.

⁵¹⁵ "Der neue Topf," *DH* 11, no. 2 (11 Oct. 1912): 12, 27.

⁵¹⁶ E. g. J. G., "Ernährungsfragen in der Kriegszeit," *DH* 13, no. 22 (26 Feb. 1915): 1-2; R. W., "Antworten. Spinat. (Frg. 514, Nr. 3)," *DH* 14, no. 11 (11 Dec. 1915): 20.

⁵¹⁷ Clara Fromberg, "Häusliche Rundschau. Gemüsezubereitung," *DH* 13, no. 25 (19 March 1915): 7.

⁵¹⁸ Z., "Briefkasten der Schriftleitung. Amalie M.," *DH* 15, no. 26 ([March or April 1917]): [I].

⁵¹⁹ K., "Häusliche Rundschau. Eiweißhaltige Speisen," *DH* 18, no. 6 (9 Nov. 1919): [13]; "Radiojosan, der neue Kräutersaft," *DH* 20, no. 33 (14 May 1922): [16].

minerals and sometimes as a catch-all term for “nutrients.”⁵²⁰ In the *Dresdner Hausfrau*, the first mention of vitamins was in a 1920 advertisement for Dr. Lauer’s “Vita,” a protein supplement that contained “easily digestible protein, lecithin, organic blood and nutrient salts, vitamins.”⁵²¹ But the first article to feature “‘vital substances’ or ‘vitamins’ (*“Lebensstoffe” oder “Vitamine”*)” did not run until 1923. It grafted the new micronutrients onto the by-now familiar admonishment against blanching vegetables on account of “the easily dissolved nutrient salts and valuable vitamins.”⁵²² In early 1925, authors of articles, reader letters, and advertisements began to connect blanching to minerals, with one quoting Ragnar Berg: “Blanched vegetables have less nutritional worth than the straw that one feeds to the poor cattle.”⁵²³ This is where they began to diverge from the nutritional recommendations of academic and industry-based researchers.

By late 1926, contributors to the *Dresdener Hausfrau* were explaining the correct way to cook vegetables in terms of acid-base balance, although not without some ambivalence. “We do not want to make a case for quackery,” ended one article, “but rather raise awareness that simple reflection and observation of nature has revealed what is right all along.”⁵²⁴ From then on, readers were regularly encouraged to protect the vitamin, mineral, and alkaline content of their families’ diets.⁵²⁵ For example, in 1928 the magazine began running weekly informational spots on the National Association of German Fruit Wholesalers’ motto, “eat more fruit, and you will

⁵²⁰ Davidis and Schulze, *Das neue Kochbuch für die deutsche Küche* (1935), 45-48, 73-75; Davidis and Holle, *Praktisches Kochbuch* (1935), 45, 81.

⁵²¹ “Enthält 45% leichtverdauliches Eiweiß; Lecithin, organische Blut- und Nährsalze, Vitamine.” “Dr. Lauer’s Eiweiß-Kost ‘Vita’,” *DH* 19, no. 9 (28 Nov. 1920): [III].

⁵²² Dr. Thraenhardt in Freiberg i. Br., “Arzt fürs Haus. Was sind ‘Vitamine’?,” *DH* 22, no. 1 (7 Oct. 1923): [12].

⁵²³ “Das abgekochte Gemüse hat weniger Nährwert als das Stroh, das man dem lieben Vieh als Futter gibt.” “Vom richtigen Gemüse kochen,” *DH* 23, no. 25 (18 March 1925): [5].

⁵²⁴ “Wir wollen hier keineswegs der Kurpfuscherei das Wort reden, sondern nur darauf aufmerksam machen, daß stille Naturbetrachtung und Beobachtung schon immer das Rechte gefunden hat.” “Neues aus der Ernährungslehre,” *DH* 25, no. 4 (27 Oct. 1926): XI.

⁵²⁵ “Vom Küchenzettel,” *DH* 25, no. 14 (5 Jan. 1927): VI; “Von den Ernährungslehren,” *DH* 26:1, no. 8 (23 Nov. 1927): IX; Margarete Weinberg, “Was die denkende Hausfrau interessiert,” *DH* 28, no. 4 (24 Oct. 1929): [3]; “Wie man Gemüse kochen soll,” *DH* 28, no. 37 (12 June 1930): VII-VIII.

remain healthy” (*Esst mehr Früchte, und Ihr bleibt gesund!*).⁵²⁶ However, its command to eat fresh fruits and vegetables—including orange juice every morning and homemade or store-bought canned produce during the long winter—clashed with calls for food autonomy and with the finer points of Berg’s acid-base theory.

Controversy with the canning industry in the 1920s: “Proper Nutrition”

In the summer of 1928, the German Hygiene Museum had partnered with the Berlin Exhibition, Trade Fair, and Tourism Office to stage “Nutrition,” a massive exhibition in the shadow of the radio tower on the western edge of the capital city. As publicity in the run up to the 1930 International Hygiene Exhibition and to celebrate the opening of the permanent museum building in Dresden, the DHM then sent a portion of its materials around Germany as a traveling exhibit entitled “Proper Nutrition” (*Richtige Ernährung*).⁵²⁷ The tour began in Saxony’s second city of Leipzig before moving to Duisburg and Barmen in western Germany, Braunschweig in north-central Germany, and finally Stuttgart and Karlsruhe in the southeastern part of the country.⁵²⁸ Over fourteen months, 223,179 Germans attended. In fact, the show was so popular that its run was extended in at least two cities.⁵²⁹

The exception to this pattern was Braunschweig. Not only was “Proper Nutrition” scheduled for a short run there (two weeks compared to five in Leipzig and eight in Barmen), but

⁵²⁶ E.g. Dr. v. K., “Der richtige Weg,” *DH* 27, no. 19 (7 Feb. 1929): [14]. “The right way” to eat was more fruit and less meat to achieve the correct balance of calories, minerals, and vitamins. The apple was specifically mentioned because “its base content promotes the excretion of uric acid and prevents its precipitation, which causes gout.” Kerstin Wilke, “‘Die deutsche Banane.’ Wirtschafts- und Kulturgeschichte der Banane im Deutschen Reich, 1900-1939” (diss., Univ. Hannover, 2004), 43-45. The idea came from the equivalent association in Great Britain. In Germany, it spread through postcards, magazines, and on produce sellers’ brown paper bags.

⁵²⁷ Niederschrift über die Sitzung des Vorstandes des Deutschen Hygiene-Museums, Dresden, 8 Oct. 1928, Nr. 47, Bd. 2, 13686 Deutsches Hygienemuseum e. V. 1908-1946, SHAD.

⁵²⁸ Leipzig (Ringmeßhaus, 29 Sept.-28 Oct., extended to 4 Nov. 1928); Duisburg (mid Nov. 1928); Barmen (Concordia, 12 Jan.-3 Feb., extended to 10 March 1929); Braunschweig (Städtischen Konzerthaus, 12-27 Juni 1929); Stuttgart (Gewerbehalle, 5-27 Oct. 1929); Karlsruhe (9-24 Nov. 1929). Doc.s 60 and 63-69, Bd. 2, Nr. Z, 13658 DHMD, SHAD.

⁵²⁹ *Das Deutsche Hygiene-Museum im Jahre 1929*, DHMD Bibliothek Hyg. A III 13/490, 29, [2]. This would have amounted to about 12.5% of the populations of the host cities. Statistisches Reichsamtsamt, *Statistisches Jahrbuch für das Deutsche Reich*, 48. Jhrg. (Berlin: Reimar Hobbing, 1929), 10-12.

as described at the head of this chapter, it was unusual in that the exhibition received negative press even before it had opened.⁵³⁰ To be perfectly honest, much of the press coverage of the tour was positive because the newspapers in host cities merely printed the short pieces that the Hygiene Museum provided, or because the reporters adopted the language of the exhibition materials. For instance, one press release described the importance of the exhibition this way:

The stomach question is not just of decisive importance for “children of the world,” it must be taken seriously not only in the life of every individual but also in the interest of the whole population while respecting hygienic as well as economic factors. ... Perception is the foundation of all knowledge.⁵³¹

The Braunschweig *Allgemeiner Anzeiger* published almost identical text on June 10. It then described the poster for the exhibition: “The calloused fists of the construction worker, which during the lunch break reach for mother’s soup pot or for bread and fruit, are a clear expression of the necessity of an adequate and appropriate nutrition.”⁵³² The poster united two interwar concerns—lack of housing and poor nutrition—and presented them in the traditional visual imagery of a simple family meal.

One Braunschweiger compared “Proper Nutrition” to an earlier exhibition, “Modern Housekeeping” (*Der moderne Haushalt*): “the home-making exhibition was individual, [but] the

⁵³⁰ One newspaper in the exhibition’s next host city of Stuttgart did report cryptically that although commercial exhibitors whose products did not fall under the theme of the exhibition would not be allowed to set up booths, “there are some groups that are known to be representative of unilateral theories in the diet question which will find expression.” This can only be a reference to Ragnar Berg and his acid-base theory. “Die Stuttgarter Ausstellung für Ernährung und Körperpflege. Das Programm der Ausstellung,” *Stuttgarter Neues Tagblatt* (24 April 1929), doc. 68b, Bd. 2, Nr. Z, 13658 DHMD, SHAD.

⁵³¹ “Die Magenfrage ist nicht nur für ‘Kinder der Welt’ von einschneidender Bedeutung, sie darf nicht nur im Leben jedes Einzelnen gewichtig behandelt, sondern sie muß im Interesse des gesamten Volkes sehr ernst genommen werden unter gleichzeitiger Beachtung hygienischer wie volkswirtschaftlicher Gesichtspunkte. ... Anschauung ist die Grundlage aller Erkenntnis.” “Für die Presse!” doc. 9, Ausstellung “Richtige Ernährung,” D IV 4696 b, Stadtarchiv Braunschweig.

⁵³² “Die schwieligen Fäuste der Bauhandwerker, die in der Mittagszeit über Mutters Suppentopf oder über Brot und Obst geraten, reden eine deutliche Sprache von der Notwendigkeit einer ausreichenden und zweckentsprechenden Ernährung.” “Richtige Ernährung,” *Allgemeiner Anzeiger* (10 June 1929), doc. 83, D IV 4696 b, Stadtarchiv Braunschweig.

nutrition exhibition is more collective.”⁵³³ Whereas the former had definite overtones of consumerism by individuals or households, the latter was undergirded by the assertion that Germans’ combined diets influenced the health of their nation. “Proper Nutrition” also differed in its explicitly scientific basis. Wrote another journalist, “the housewife who visits this exhibition should pay more attention to this section” on the preparation of food “**in order to translate the science of the laboratory into kitchen practice.**”⁵³⁴ Too bad so much of the advice was cookie-cutter and dull, according to this visitor, but its dissemination was still important.

The “proper nutrition” advertised in the exhibition’s title was the new mainstream nutrition. One DHM-produced article that made the rounds of German newspapers set up a false binary of “calories or vitamins?” Some nutritionists stressed the importance of consuming enough calories, while others emphasized the newer science of vitamins, but partisans of both camps were incorrect: “Neither protein nor calories alone, neither minerals nor vitamins alone, neither fat nor sugars alone can keep a person healthy in the long run, but only the correct combination of all nutrients.”⁵³⁵ The exhibition’s creators sought a third way between quantitative and qualitative nutrition that would be agreeable to all but the extremists. Rather than a one-sided diet of either primarily meat or else no meat at all, “proper nutrition” in 1928 consisted of a “mixed” or balanced diet (*gemischte Kost*) of meat, vegetables, potatoes, fruit, dark bread, and dairy products.⁵³⁶

⁵³³ “Die Haushaltsausstellung war individuell, die Ernährungsausstellung ist mehr kollektiv....” “Die richtige Ernährung,” *Braunschweigischer Neueste Nachrichten* (13 June 1929), doc 99, D IV 4696 b, Braunschweig.

⁵³⁴ “Deshalb soll die Hausfrau, die diese Ausstellung besucht, bei diesem Ausstellungsstand etwas schärfer hinsehen und versuchen **die Wissenschaft des Laboratoriums in die Küchenpraxis umzusetzen.**” Emphasis in original. “Die richtige Ernährung,” doc. 99, D IV 4696 b, Stadtarchiv Braunschweig.

⁵³⁵ “Weder das Eiweiß noch die Kalorien allein, weder die Mineralstoffe noch die Vitamine allein, weder das Fett noch die Zuckerstoffe allein können den Menschen auf die Dauer gesund erhalten, sondern nur die richtige Mischung von allen Nährstoffen.” “Kalorien oder Vitamine? Aufgaben der Ausstellung ‘Richtige Ernährung’,” *Bergisch-Märkische Zeitung* (Elberfeld) (4 Jan. 1929), doc. 67b, Bd. 2, Nr. Z, 13658 DHMD, SHAD; “Kalorien oder Vitamine?” *Volksfreund* (5 June 1929), doc. 60, D IV 4696 b, Stadtarchiv Braunschweig.

⁵³⁶ Page 15, doc. 11-16, D IV 4696 b, Stadtarchiv Braunschweig.

Vogel and the other designers approached this lesson from every conceivable angle. The exhibit itself had seven parts: Why must we eat? How much should we eat? How does the body process food? What do nutrients provide the body? How do we make our diet nutritious and cheap? How do we prepare our food? How do we feed ourselves properly? Displays included two- and three-dimensional representations of the elements that make up the human body, the anatomy of the digestive system, the quality of the protein in various foods, calorie expenditure for a number of occupations, a model kitchen, statistics on meat consumption in Germany, and how to plan and serve a “proper” (*zweckmäßig*) meal. As with so many other DHM exhibitions, local physicians gave daily hour-long tours (6pm on weekdays, 11:30am on Sundays).⁵³⁷ In addition, twice-daily free educational films sponsored by various business interests tempted viewers to adopt this mindset of a healthy diet with slapstick, cartoons, and documentaries about modern production methods for fruit juice, sugar, fish, canned goods, and dairy products.⁵³⁸

According to the exhibition, there were three different ways to eat improperly, from least to most common: eating too little, eating too much, and choosing or preparing foods improperly. To the disgust of the reporter for the working-class *Neue Arbeiterzeitung*,

the exhibition leadership cares much too much about the fate of the so-called overeaters ... **We miss** for example, a section that would clearly illustrate **how persons on public relief with families are supposed to eat ‘properly’ on the pennies they receive!** ... We can see here the drawbacks of the capitalist system.⁵³⁹

⁵³⁷ “Ausstellung ‘Richtige Ernährung’ im Städtischen Konzerthause,” doc. 92, D IV 4696 b, Stadtarchiv Braunschweig.

⁵³⁸ These included *Für Dich* and *Flüssiges Obst* (from the Deutsche Frauenbund für alkoholfreie Kultur), *Kristalle des Lebens* (Reichsvereinigung Deutscher Hausfrauen), *Das wöchentliche Fischgericht* (Verein Braunschweiger Fischhändler), *Braunschweiger Konservenindustrie* (Verein der Konservenfabrikanten), a film on the latest cooking appliances from the Allgemeine Elektrizitäts-Gesellschaft, and *Bedeutung der Milch, Seff auf dem Wege zu Kraft und Schönheit, Verarbeitung der Milch zu Butter und Käse, Reise im Schlaraffenland*, and *Hänschens Rettung* (Braunschweigische Landesmilchausschuß). “Filmvorträge in der Ernährungsausstellung,” doc. 102, D IV 4696 b, Stadtarchiv Braunschweig. Seff was half of the popular comedic film duo “Cocl & Seff” played by Rudolf Walter (1885-1950) and Josef Holub (1890-1965).

⁵³⁹ “Aufgefallen ist uns nur, daß sich die Ausstellungsleitung sicher viel zu viel Sorge um das Schicksal der sogenannten Vollgefressenen gemacht hat ... **Wir vermissen** z. B. eine Abteilung, in der anschaulich dargestellt würde, **wie Unterstützungsempfänger mit Familie von ihren paar Kröten sich ‘richtig’ ernähren sollen!** ... Wir sehen also auch hier den Pferdefuß des kapitalistischen Systems.” “Eröffnung der Ausstellung ‘Richtige

To this visitor, the exhibitors assumed that ignorance was a greater problem than economics. A poster warning “Fat people don’t grow old,” or a weekly menu consisting of five meals a day laid out on a long table covered in a white tablecloth, could easily rankle someone who was more concerned about his or her inner-city children developing rickets from lack of sunshine or contracting tuberculosis from unpasteurized milk (topics also covered). Exhibition materials repeatedly insisted that workers could afford to eat well if they would just spend their money properly: on common potatoes instead of meat, for instance, which had been the gold standard of nutrition until quite recently and was still a status symbol. But the politics of the worker’s table was clearly less concerned with the thriving of the national body than with the survival of the individual bodies of workers, the poor, and their families. Members of the middle classes had the comfort of being able to choose a diet to match their lifestyles and politics—including a nutrient-rich diet to match nationalist or organicist sentiments—and the wherewithal to dictate the dietary habits of workers.

The *Braunschweigische Staatszeitung* revealed its bias toward the pillars of the local economy when it waxed lyrical about the special exhibit that the canning industry had rendered: “In the special exhibition, the tastefully constructed stand of the canning industry is particularly striking. All the products of this industrial sector flourishing here in Braunschweig and so vital for our population are displayed in a very attractive way.”⁵⁴⁰ A banner reading “THE BEST, FAST—CANNED GOODS” crowned the three-walled, 30-x-8-meter booth (33’ x 26’).⁵⁴¹

Ernährung, “” *Neue Arbeiterzeitung* (14 June 1929), bolding in original, doc. 104, D IV 4696 b, Stadtarchiv Braunschweig. Emphasis in original.

⁵⁴⁰ “In der Sonderausstellung fällt der geschmackvoll aufgebaute Stand der Konservenindustrie besonders ins Auge. All die Erzeugnisse dieses gerade in Braunschweig so blühenden und für unsere Bevölkerung so lebenswichtigen Industriezweiges in in überaus ansprechender Weise zur Schau gestellt.” “Eröffnung der Ausstellung ‘Richtige Ernährung,’” *Braunschweigische Staatszeitung* (12 June 1929), doc. 93, D IV 4696 b, Stadtarchiv Braunschweig.

⁵⁴¹ I assume it was the same booth that a Dr. H. B. (probably Hugo Böttger, 1867-1937) at the Economic Union of the Canning Industry (*Wirtschaftliche Vereinigung der Konserven Industrie*) had put together for a meeting of the

Beneath this were oil paintings of boys picnicking with tins of food and of a mother, maid, and daughter preparing and eating canned foods in a kitchen. The left-hand wall illustrated the process of canning peas, while on the right-hand wall three tiers showed off various finished products, including tall jars with giant asparagus. In the middle of the booth two chairs stood next to a table on which recipes and other literature had been placed. The posters on the side walls argued that canned foods were a safe, common, nutritious, efficient, and necessary part of the economy in which Germans should take pride.

That “Proper Nutrition” emphasized the choice and preparation of food more than over- or under-eating reflected the new scientific nutrition. The application of heat (i.e. cooking) was an important cultural and pre-physiological process that improved the taste of food, added variety, and made digestion easier. However, overcooked food was nutritionally inferior. One journalist dutifully repeated the message:

Long cooking destroys not only the vitamins but also certain mineral bonds and damages the protein. Boiling vegetables is definitely to be avoided, if the vegetable water is not re-used in soups or sauces. Into the brew water go the easily soluble minerals and above all, vitamins, but also a portion of the protein and carbohydrates.⁵⁴²

This was precisely the cooking reform that Ragnar Berg had been publicizing for almost two decades in almost identical language. None of the articles that mentioned the proper way to cook vegetables connected blanching to acid-base imbalance, but this detail was found in the guidebook that Martin Vogel had written and to which Dr. Kanter had so strenuously objected.

Without calling Berg by name, the pamphlet describes vitamins, minerals, acid-base balance, and

German Agricultural Society (*Deutschen Landwirtschafts-Gesellschaft*) in Munich the week before “Proper Nutrition” opened in Braunschweig. Dr. H. B., “Erste Werbeausstellung der deutschen Gemüse- und Obstkonserven-Industrie,” *Konserven-Industrie* 16, no. 24 (13 June 1929): 340-341.

⁵⁴² “Langes Kochen zerstört nicht nur die Vitamine, sondern auch gewisse Mineralstoffverbindungen und schädigt das Eiweiß. Das Abbrühen der Gemüse ist unbedingt zu unterlassen, sofern nicht das Gemüsewasser in Suppen oder Tunken wieder verwendet wird. In das Brühwasser gehen nämlich zu allererst die leichtlöslichen Mineralstoffe, Vitamine, aber auch ein Teil des Eiweißes und der Kohlenhydrate über.” “Aus der Stadt. Die Ausstellung ‘Richtige Ernährung’ eröffnet,” *Volksfreund* (13 June 1929), doc. 98, D IV 4696 b, Stadtarchiv Braunschweig.

“metabolic accumulations” (*Stoffwechselschlacken*), and it characterizes canned goods as a food that Germans should eat less of. The glossary acknowledges that “canned goods contain all the valuable nutrients of fresh food when prepared properly, only the vitamin content is usually much lower” but continues, “blanched (boiled and bleached) vegetables are worthless.”⁵⁴³

Because of the furor over the guidebook, Martin Vogel adopted a markedly more moderate position in an essay quickly published in several local journals. He complimented the canning industry on being able to make almost every food keep, thereby evening out production and consumption temporally (between seasons) and spatially (between regions and even continents). Conspicuously mentioning no specifics about production techniques, Vogel offered platitudes about the canning industry improving the nutritional value of canned goods at the same time that science had been demonstrating the importance of vitamins and minerals. Because no single food provides all the vitamins a healthy body needs, the key was to eat a combination of foods every day, including raw produce. “With this small restriction,” summed up Vogel, “we may declare appropriately produced canned vegetables quite valuable foods that allow us to supply anywhere, at any time, the nutrients that external reasons would otherwise have denied us.”⁵⁴⁴ The offending guidebook was not republished, and the rest of the show went on as planned. Even though Berg did not directly contribute either to the Berlin expo “Nutrition” or to the traveling show “Proper Nutrition,” he became a lightning rod of controversy, as with Arthur Huch and the *Konserven-Zeitung* two decades earlier.

Conclusion

⁵⁴³ “Konserven. Enthalten bei vernünftiger Zubereitung alle wertvollen Nährstoffe der frischen Nahrungsmittel, nur Vitamingehalt ist meist stark vermindert. Blanchiertes (abgebrühtes und gebleichtes) Gemüse ist wertlos.” Vogel, *Ernährungsführer*, 61.

⁵⁴⁴ “Mit dieser kleinen Einschränkung dürfen wir die zweckmäßig hergestellten Gemüsekonserven als recht wertvolle Nahrungsmittel ansprechen, die uns überall und zu jeder Zeit die Werte zuzuführen gestatten, wo sie uns sonst aus äußeren Gründen versagt blieben.” Vogel, “Der Gesundheitswert der Konserven,” 342.

In 1931, Ragnar Berg was finally able to publish some of the results of his feeding experiments with Carl and Walter Röse.⁵⁴⁵ W. H. Jansen reviewed the book in the *Münchener medizinische Wochenschrift* with the strained patience of someone who had been correcting the same errors in metabolic understanding and experimental design for almost fifteen years. “We physicians often have to deal with it when the lay public asks about the meaning and significance of this theory and what we think about it,” he complained.⁵⁴⁶ Berg’s simplified chemical understanding of the body as a combustion chamber that had a 1:1 ratio between input and output just did not match the complicated biological reality. Echoing his opponent’s constant refrain, Jansen agreed that physiologists really did not know that much about the details of digestion, assimilation, and metabolism. “We only know one thing for sure now,” he stated, “that the organism always maintains itself in acid-base equilibrium.”⁵⁴⁷ In case his physiological knowledge and experience designing experiments were not sufficient to convince readers of this medical journal that Jansen had the upper hand, he repeatedly and pointedly referred to his expertise as a practicing clinician—something Berg could not claim, his second-hand role at the sanatorium notwithstanding. “As we practicing physicians know . . .,” wrote Jansen in one place; in another, he sighed that the ridiculous claims Berg made obviated any medical discussion (*erübrigt ärztlicherseits jede Diskussion*). “For us doctors pH is, despite Berg, a very useful measure of the state of the urine,” he concluded.⁵⁴⁸ The fact that Berg was a self-taught nutritional chemist at an institution (in)famous for its naturopathic practice marked him as a

⁵⁴⁵ Ragnar Berg, *Eiweissbedarf und Mineralstoffwechsel bei einfachster Ernährung* (Leipzig: Hirzel, 1931).

⁵⁴⁶ “Wir Aerzte bekommen vielfach insofern mit ihr zu tun, als wir vom Laienpublikum nach Sinn und Bedeutung dieser Lehre und auch nach unserem Urteil darüber befragt werden.” Jansen, “Was ist an der Lehre vom Basenüberschuß?” *MmW* 79, no. 45 (4 Nov. 1932): 1798. Berg defended himself in “Was ist an der Ernährungslehre vom Basenüberschuß?” *MmW* 79, no. 52 (23 Dec. 1932): 2089.

⁵⁴⁷ “Nur eines wissen wir heute sicher, daß der Organismus sich stets im Säure-Basengleichgewicht erhält.” Jansen, “Was ist an der Lehre vom Basenüberschuß?” 1798.

⁵⁴⁸ “Für uns Aerzte ist der pH-Wert trotz Berg ein sehr brauchbares Maß für die Reaktionslage des Harns.” *Ibid.* and W. H. Jansen, “Erwiderung auf Ragnar Berg: ‘Was ist an der Ernährungslehre vom Basenüberschuß?’” *MmW* 79, no. 52 (23 Dec. 1932): 2089-2090.

medical outsider and reduced the credibility of his theories to allopaths like Jansen.

Berg had defined acidification as such a widespread phenomenon that it lost its power as an explanatory factor. With the possible exception of anemic infants fed only watered-down cow's milk gruel, almost no one visibly suffered from lack of minerals (such as iron) in their diets. It seemed that no one ever died of too little calcium, and few if any deaths could be convincingly proven to have resulted from excess inorganic acid build-up. While minerals were understandably necessary for the bones and nerves of growing organisms, to most medical practitioners acid-base balance was if anything responsible for the dwindling physical and mental energy associated with late winter and early spring—hardly a lethal condition. Meanwhile, the sailors and hostages aboard the *Kronprinz Friedrich Wilhelm* were cured of scurvy after a few days of bran and vegetable soup on shore at Norfolk, Virginia, in April 1915, and inner-city slum children with short stature and rickety limbs grew with wholesome food and sunshine.⁵⁴⁹ From the perspective of the clinic, vitamins were more convincing than minerals as factors in disease states.

Dr. Jansen was hardly the only opponent Berg offended. Hermann Serger complained of Berg's "ungentlemanly, rude tone" when addressing the canning industry, Berg's personal attacks on Serger's work as "dilettantish," and Berg's tendency to burn bridges to experts in other fields. "Are you in the [canning] industry or am I?" Serger asked rhetorically in 1914 and again in 1921.⁵⁵⁰ Berg sometimes had to defend his outbursts to his allies. "Regarding my 'attack' on Jansen's work," he wrote to Röse in 1918, he could think of four reasons why Jansen's experimental design was faulty; and besides, animal physiologist Councilor Nathan

⁵⁴⁹ Berg, *Alltägliche Wunder*, 22-24. The *Kronprinz Wilhelm* story remained a favorite of life-reform nutritionists. Alfred Richter and Helene Richter, *Fleischlose Kost. Praktische Winke*, 5. Aufl. (Dresden: Naturheilinstitut Alfred Richter, [after 1933]), 47.

⁵⁵⁰ "Wie wollen Sie alle die praktischen Verhältnisse überhaupt beurteilen, stehen Sie in der Industrie oder ich?!" Serger, "Das Abbrühen von Nahrungsmitteln," 1080, quoting himself from *Konserven-Industrie* 1, no. 12 (1914).

Zuntz (1847-1920) had complimented Berg on his presentation in Berlin.⁵⁵¹

A combination of his background in chemistry and naturopathy, poor science, verbal pugilism, and a lack of direct proof of minerals' necessity for health prevented the scientific mainstream from accepting his theories. He had a tendency to misread others' work; he adapted his thinking to accommodate vitamins but not the blood buffer; and his voluminous tables were more confusing than convincing.⁵⁵² In his treatise with Martin Vogel, Berg wrote of himself, "Years-long experiments on metabolism by Berg further showed that mineral metabolism has a completely unforeseen importance that is still not clear in the least."⁵⁵³ After two decades as a nutritional chemist, he was still justifying the need for research in this area, whose "completely unforeseen importance" he had not decided *a priori* but rather discovered in the laboratory, like any good scientist. The problem was that it was "still not clear" what exactly he and Röse had accomplished in mineral metabolism after all that time.

Berg's research and publishing career from the 1900s through the 1930s essentially boiled down to a campaign against the deleterious effects of water, heat, and acid. That food soaked or cooked in water lost substances that gave it pleasing aesthetic qualities had been accepted since Liebig put his name on Pettenkofer's meat broth. Meat broth contained no nutritional value under the calorie paradigm, but Berg revived the issue when he focused on the mineral and alkaline content of vegetable stock. Once researchers began studying vitamins, heat itself became a deleterious factor in the kitchen. It killed the bacteria that made un-canned food spoil, but it also denatured vitamins and destroyed their health- and life-giving capacity. At bottom, what I suspect was a distrust of a fundamental chemical entity (acids) fueled an overly

⁵⁵¹ Berg to Lieber Herr Hofrat! [Carl Röse], 22 March [1918], 866 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

⁵⁵² E. Rost, "[Review of R. Berg, Die Nahrungs- und Genußmittel...]," *DmW* 40, Nr. 13 (26 March 1914): 658.

⁵⁵³ "Jahrelang fortgesetzte Stoffwechselfersuche von Berg zeigten weiter, daß dem Mineralstoffwechsel eine ganz ungeahnte Bedeutung zukommt, die auch heute noch nicht im entferntesten klargestellt ist." Berg and Vogel, *Grundlagen* (1925), 86; for more tentative language, 89.

simplistic misunderstanding of renal chemistry and physiology.

While physicians and laboratory scientists continued to advise that a diet containing sufficient calories, macromolecules (fats, carbs, protein), and vitamins provided sufficient minerals, domestic scientists and other popularizers of nutrition were more receptive to ideas like Berg's. Of all the groups they targeted, women and girls were the most important, because of their normative social roles as housekeepers and cooks for their own and others' families.⁵⁵⁴

Wrote one journalist,

The woman is the guardian of the health of family and nation. Her kitchen is the best laboratory. That of the physician stands in second place. Advantage does not lie with the complicated menu; rather, theoretical knowledge of cooking is absolutely necessary.⁵⁵⁵

That theoretical knowledge included the hows and whys of maximizing micronutrients in the household's diet. Ways to do so included serving more (raw) fruits and vegetables, steaming vegetables, boiling potatoes in their skins, and reusing blanching water. Confounding an easy reception study, these kitchen practices could be validated by both vitamins (and minerals) as Jansen & Co. understood them and by acid-base balance à la Berg. Unfortunately, it is impossible to tell just how many Germans steamed or blanched their vegetables and why.⁵⁵⁶

However, we do know that they could not be convinced to eat less or no meat, or to give up their status-rich but nutrient-poor refined grains for whole grains or lowly potatoes.

We can see change at the level of discourse by comparing recipes for canning peas at

⁵⁵⁴ "Freistaat Braunschweig und Nachbargebiete," *Gandersheimer Kreisblatt* (15/16 June 1929), doc. 108, D IV 4696 b, Stadtarchiv Braunschweig.

⁵⁵⁵ "Die Frau ist so die Hüterin der Gesundheit von Familie und Volk überhaupt. Ihre Küche ist das beste Laboratorium. Dasjenige des Arztes kommt erst in zweiter Linie. Nicht der komplizierte Küchenzettel schafft den Vorteil; aber theoretische Kenntnisse der Kochkunst sind unbedingt notwendig." "Küchenweisheiten," *DA* 197, no. 577 (9 Dec. 1926): 5. Prof. Dr. Kraft had given a Deutschen Verein für Volkshygiene lecture on nutrition.

⁵⁵⁶ Uwe Spiekermann, "Science, Fruits, and Vegetables: A Case Study on the Interaction of Knowledge and Consumption in Nineteenth- and Twentieth-Century Germany," in *Decoding Modern Consumer Societies*, ed. Hartmut Berghoff and Uwe Spiekermann, 229-248 (New York: Palgrave Macmillan, 2012), 239-242. Spiekermann asserts that throughout this period, economics and personal taste were more important factors in the fruit and vegetable intake of the majority of Germans than nutritional science or educational campaigns.

¹²⁶ Davidis and Holle, *Praktisches Kochbuch* (1901), 646-648.

home and in the factory. Around 1900, a cookbook might say to fill up the cans with the blanching water and to sterilize for two hours in a hot water bath (~98° C).⁵⁵⁷ When a can was opened for use, the liquid should be poured off and the contents heated in salted water; this would yield a better tasting side dish than if the filling water were used too.⁵⁵⁸ By the 1930s, cookbooks instructed housewives preserving produce at home not to blanch vegetables—so as to preserve their vitamins, minerals, and/or bases—and to skip either the parboiling step or the second sterilization. The second recipe at the start of this chapter reflects the influence of the newer knowledge of nutrition in that it halves the amount of time parboiled peas needed to be sterilized from two hours to one. The most dedicated housewives would re-use the filling liquid, but most still poured it off before incorporating the contents into a meal.⁵⁵⁹

Finally, let us compare home-made and factory canned goods, as home canning was more popular than store-bought canned goods for reasons of taste, housewifely pride, and (perceived) food safety and nutrition.⁵⁶⁰ The 1931 cookbook recipe also gives an option sometimes used by the canning industry, called fractionated sterilization. In this two-step process, the first heating occurs at temperatures high enough to kill live bacteria but not high enough to destroy spores, because that would damage the nutrients; after three days any spores have developed into bacteria that should die during the second heating.⁵⁶¹ In both cases, the peas are heated only twice. For his part, Hermann Serger regularly claimed that factory-produced canned goods were

⁵⁵⁷ Davidis and Holle, *Praktisches Kochbuch* (1901), 646-648.

⁵⁵⁸ Davidis-Holle, *Praktisches Kochbuch* (1901), 78-80; cf. Elise Starker, *Hygienisches Kochbuch zum Gebrauch für ehemalige Curgäste von Dr. Lahmann's Sanatorium auf Weisser Hirsch bei Dresden*, 16. Aufl. (Dresden: Alexander Köhler, 1905), vi.

⁵⁵⁹ Davidis and Holle, *Praktisches Kochbuch* (1935), 562-563.

⁵⁶⁰ By the late 1920s, factory canned goods were often of high, standardized quality and retained sufficient vitamins, although many also contained chemical preservatives. Uwe Spiekermann, "Twentieth-Century Product Innovations in the German Food Industry," *Business History Review* 83, no. 2 (Summer 2009): 305-310; *ibid.*, "Zeitensprünge: Lebensmittelkonservierung zwischen Haushalt und Industrie 1880-1940," in *Ernährungskultur im Wandel der Zeiten*, ed. Katalyse e. V. and Buntstift e. V., 30-42 (Cologne: Katalyse, 1997), 35-39.

⁵⁶¹ Dr. Hermann Serger und Dr. Karl Clarck, "Konserven und Konservierung von Lebensmitteln," *Zeitschrift für Ernährung* 1, no. 8 (Aug. 1931): 256-261, here 260-261.

more nutritious than those made at home and less likely to fail due to poor sterilization. In a specialty journal in 1931 he described a pea-canning process that reads very much like the 1914 factory recipe above, except the sterilization times are shorter and temperatures are higher, because they use an autoclave (pressurized steam).⁵⁶² By the 1930s, industrial methods could preserve vitamins as much as was possible; if anything, it was housewives' simple equipment that jeopardized canned goods' nutritional worth.⁵⁶³ After decades of improvements, the German canning industry perceived Berg's criticisms, like reports in the public press about canned-good food poisonings, as unfounded, malicious attacks on a struggling but honest economic sector.⁵⁶⁴

In the end, Ragnar Berg achieved mixed results. He had undertaken years of laboratory and self-experimentation to fill a gap in scientific knowledge that few scientists or physicians were interested in filling. Berg could not convince the scientific mainstream of the rightness of his theories, but he did win over the domestic science experts who presumably influenced the millions of Germans responsible for shopping and cooking for their families. Similarly, he had more success promulgating best practices in domestic than in industrial kitchens, albeit for confounding reasons. Some of the authors who used Berg's theories seem to have accepted him as an expert on account of his laboratory experiments. I suspect his recommendations also made a certain amount of intuitive sense to those who had absorbed the lesson about the importance of micronutrients—the lowest level on the telescopic body—to individual and collective health. Having thus explored the individual (sick) eater, the anatomical and physiological levels of eating bodies, and molecules that required the greatest magnification, let us turn in the second

⁵⁶² Hermann Serger and Karl Clarck, "Konserven und Konservierung von Lebensmitteln (Schluß)," *Zeitschrift für Ernährung* 1, no. 9 (Sept. 1931): 271-292, esp. 279-280.

⁵⁶³ Arthur Scheunert, "Neuere Forschungsergebnisse über das Verhalten der Vitamine bei der Gemüsekonservierung," *Schriftenreihe der Fachgruppe Obst- und Gemüseverwertungsindustrie*, Heft 3 (1939): 70-82.

⁵⁶⁴ Spiekermann, "Twentieth-Century Product Innovations," 291-315; *ibid.*, "Redefining Food: the Standardization of Products and Production in Europe and the United States, 1880-1914," *History and Technology* 27, no. 1 (March 2011): 11-36.

section to the nation of eaters and the families in which they supped.

PART II

“The Cooking Spoon is the Scepter of the People’s Health”⁵⁶⁵:

Nutrition & World War I

⁵⁶⁵ “Sie hat den Kochlöffel als Szepter der Volksgesundheit erkennen lassen, und sie hat dies Szepter führen gelehrt.” Ilse Reicke, “Die erste Hausfrau Deutschlands. Zum 80. Geburtstag von Dr. h. c. Hedwig Heyl am 5. Mai 1930,” *Dresdner Nachricht* 230 (1 May 1930): 8.

Introductory Essay to Part II: The Blockade and Rationing in Saxony

Tuesday: Turnip dish.—Seasoned herring.

Turnip dish. The once-despised turnip [actually rutabaga] is now a much-desired vegetable whose nutritional value can be increased through proper preparation. Peel and chop the necessary number of turnips, cook them a few minutes in boiling water, pour off the water and put them in fresh water with salt; add some bouillon cubes and grated onion and let the turnips cook until soft. Finally, add parboiled potato cubes and let everything cook through, so the dish will be tasty and thick. A little finely chopped parsley increases its wholesomeness.⁵⁶⁶

Pichelsteiner

3/4 lb beef (or half beef, half pork), 2 tbsp. fat, 1 onion, 2 lb potatoes, 2-3 carrots, 2 kohlrabi, 2 leeks, 1 celery root, 1 parsley root, salt and pepper, ½ L water. Tenderize the meat, wash it, and cut it into cubes. Peel potatoes and cut them into slices. Clean and wash the vegetables and chop into cubes or slices. Melt the fat in the cooking-box pot and sauté the onion. Place a layer of potatoes on the bottom, then meat, and sprinkle with salt and pepper. Repeat with a layer of mixed vegetables and so on until the pot is filled; there must be potatoes on top. Pour the water over everything, bring to a boil, and let cook slowly in the covered pot about 2 hours. This dish is particularly well suited to preparation in a cooking-box. Precooking time: 30 minutes. Cooking time in the box: 3 hours.⁵⁶⁷

⁵⁶⁶ “Dienstag: Kohlrübengericht.—Gewürzheringe. Kohlrübengericht. Die früher so verachtete Kohlrübe ist jetzt eine begehrte Gemüseart, deren Nährwert durch richtige Zubereitung noch erhöht werden kann. Man schält die nötige Anzahl Kohlrüben und schneidet sie stiftlig, läßt sie einige Minuten in siedendem Wasser, gießt dieses ab und tut sie nun in frisches Wasser mit Salz, fügt etwas Würfelbrühe sowie geriebene Zwiebel dazu, worin man die Rüben weich kochen läßt. Halbgargekochte würflich geschnittene Kartoffeln kommen zuletzt dazu und werden mitgekocht, wodurch das Gemüse sehr schmackhaft und sämig wird. Etwas feingehackte Petersilie erhöht die Bekömmlichkeit.” “Für die Küche. Küchenzettel für vereinfachte Haushaltsführung,” *Dresdner Hausfrau* 15, no. 11 (16 Dec. 1916): 4.

⁵⁶⁷ “Pichelsteiner. 3/4 Pfd. Rindfleisch (oder halb-Rind, halb Schweinefleisch), 2 Eßl. Fett, 1 Zwiebel, 2 Pfd. Kartoffeln, 2 bis 3 Möhren, 2 Kohlrabi, 2 Porree, 1 Sellerie, 1 Petersilienwurzel, Salz und Pfeffer, 1/2 L Wasser. Fleisch klopfen, waschen, in Würfel schneiden. Kartoffeln schälen und in Scheiben schneiden. Gemüse putzen, waschen, in feine Würfel oder Scheibchen schneiden. Fett im Kochkistentopf zergehen lassen, Zwiebel darin dünsten, eine Lage Kartoffelscheiben hinein tun, darauf Fleischwürfel, mit Salz und Pfeffer bestreut; dann eine Lage gemischtes Gemüse und so fortfahren, bis der Topf gefüllt ist; obenauf müssen Kartoffeln sein. Wasser darüber gießen, zum Kochen bringen und etwa 2 Stunden im geschlossenen Topf langsam kochen lassen. Dieses Gericht eignet sich ganz besonders gut zur Bereitung in der Kochkiste. Vorkochzeit: 30 Minuten. Garzeit in der Kiste: 3 Stunden.” Magdalene Pfeifer, *Sächsisches Kriegskochbuch für ländliche Verhältnisse: Anleitung zur Herstellung einer einfachen, billigen und nahrhaften Kost*, 3. Aufl. (Dresden: Landeskulturrat für das Königreich Sachsen, 1915), 42. A “cooking box” (*Kochkiste*) was just what it sounds like: an insulated box into which covered pots of food could be placed to continue cooking or to keep warm until mealtime without the fuel needed to heat a stove.

Generations from now the memory of this time of suffering with its serious sacrifices of collective strength and health will live on in the German people. One used to say, whoever saw the horrors of the battlefield with his own eyes became a resolute pacifist. In Germany those who stayed behind also learned to fear the terrors of war.⁵⁶⁸

For years after World War I, what soldiers remembered was the shelling. What German civilians remembered was the rationing. Both experiences revealed the limits of human psychology and physiology, whether of nerves or of the gastrointestinal tract. What united the various individual and collective German experiences of food during and after the war was a sense of bitterness and suffering as the starving *Volk* lost both strength and health. The Allies' trade embargo, the resulting hunger, and the German governments' piecemeal responses are therefore critical to the development of the telescopic body as a biologized social metaphor. This essay describes the mechanics of rationing in Saxony that will be helpful background for the succeeding chapters: in Chapter 4, I use debates about "collective feeding" to examine one telescopic layer interposed between the individual and the nation, the family. In Chapter 5, I show how the economics of scarcity went so far as to support sociocultural values like work-based utilitarianism that disfavored the home-bound and institutionalized sick until their suffering could be deployed as emotional ammunition in an effort to end the economic war that continued after the overt fighting had ended.

The destruction of crops, the diversion of laborers, animals, and chemicals, and the disruption of trade relations reduced the food supply around the world, with combatant nations more affected and battlefield nations most of all. Britain and France managed to delay out-right rationing until near the end of the war, making do with price controls, exhortations to self-

⁵⁶⁸ "Noch nach Generationen wird im deutschen Volke die Erinnerung an diese Leidenszeit mit ihren schweren Opfern an Volkskraft und Volksgesundheit fortleben. Man hat gesagt, wer das Grauen des Schlachtfeldes mit eigenen Augen gesehen habe, sei zum überzeugten Pazifisten geworden. In Deutschland haben auch die Daheimgebliebenen die Schrecken des Krieges kennen und fürchten gelernt." August Skalweit, *Die deutsche Kriegsernährungswirtschaft* (New Haven: Yale University Press, 1927), 3.

sacrifice, and some governmental controls; but they never rationed bread, that all-important staple article and symbol of stability.⁵⁶⁹ The situation was more dire and less well-handled in Central Europe. What Germans called “the hunger blockade” (*die Hungerblockade*) consisted of a series of escalating measures designed to cripple the economies of Germany and Austria-Hungary. In addition to the expected cessation of trade with declared enemies (Russia had been Germany’s greatest food trading partner before the war), the North Sea and Adriatic Sea were mined; both neutral and belligerent ships were searched for contraband—including foodstuffs bound for civilian populations; and promises were extracted from occupied and/or neutral countries (namely Belgium, the Netherlands, Denmark, Sweden, and Norway) not to pass on provisions indirectly.

No side was blameless: the Germans provided plenty of provocation, and the Americans prevaricated before finally tightening the noose themselves when they joined the war in late 1917; but the British were primarily responsible for ignoring both formal and informal international maritime law.⁵⁷⁰ The Allies’ trade embargo against the Central Powers continued until April 1919, when some food was allowed through, but it was not completely lifted until the representatives of the new, democratic German Reich signed the Treaty of Versailles on 28 June 1919, the five-year anniversary of the assassination of Archduke Franz Ferdinand and his wife Sophie, Duchess of Hohenburg. Although the official position of the German government during

⁵⁶⁹ Tammy M. Proctor, *Civilians in a World at War, 1914-1918* (New York: New York University Press, 2010), 84-97; Thierry Bonzon, “Consumption and Total Warfare in Paris (1914-1918),” in *Food and Conflict in the Age of the Two World Wars*, ed. Frank Trantmann and Flemming Just, 49-64 (New York: Palgrave Macmillan, 2006); Thierry Bonzon and Belinda Davis, “Feeding the Cities,” in *Capital Cities at War: Paris, London, Berlin 1914-1919*, ed. Jay Winter and Jean-Louis Robert, vol. 1, 305-341 (New York: Cambridge University Press, 1997); Peter Dewey, “Nutrition and Living Standards in Wartime Britain,” in *The Upheaval of War: Family, Work, and Welfare in Europe, 1914-1918*, ed. Richard Wall and J. M. Winter, 917-220 (New York: Cambridge University Press, 1988).

⁵⁷⁰ The blockade was illegal according to both the Declaration of Paris (1856), which had been ratified by most of the belligerents, and the Declaration of London (1909), which while never ratified had been included in the manuals of the British navy. C. Paul Vincent, *The Politics of Hunger: The Allied Blockade of Germany, 1915-1919* (Athens, OH: Ohio University Press, 1985), 27-36.

the war was one of optimism about the civilian population's ability to "hold out" (*durchhalten*) until the military won victory on the battlefield, after hostilities ended the new government reversed course and emphasized the excess morbidity and mortality caused by the restrictions.⁵⁷¹

The blockade continues to generate interest in its economics, domestic and foreign policies, and health implications. Excellent studies like those by Gerald Feldman, Jay Winter, Belinda Davis, Anne Roerkohl, and Roger Chickering describe the responses of military and civilian leaders, businessmen, and housewives in the Reich capital of Berlin, in industrial areas like Prussian Westphalia, and in the city of Freiburg in Baden-Württemberg near the Western Front.⁵⁷² It is precisely because these historians have demonstrated that experiences varied so much that more local and regional studies are necessary. On the whole, German civilians starved due to an absolute reduction in food production; the adult population lost an estimated 20% of its body weight.⁵⁷³ But relative inequalities in food distribution affected groups of individuals differently depending on whether they were coal miners in the Ruhr district, dairy farmers in

⁵⁷¹ Hans Cürliis, Nicholas Haufmann, Georg Reimann, E. Rosenthal, and Curt Thomalla, *Die Wirkung der Hungerblockade auf die Volksgesundheit* (Berlin: UFA Kulturabteilung, 1921), 53 mins., Nr. 18792, Bundesarchiv-Filmarchiv, Berlin; Franz Bumm and Rudolf Abel, *Deutschlands Gesundheitsverhältnisse unter dem Einfluss des Weltkrieges*, 2 vols. (Stuttgart: Deutsche Verlags-Anstalt, 1928.)

⁵⁷² Gerald D. Feldman, *Army, Industry and Labor in Germany, 1914-1918* (Princeton: Princeton University Press, 1966); Jay Winter and Jean-Louis Robert, eds., *Capital Cities at War: Paris, London, Berlin 1914-1919*, vol. 1 (New York: Cambridge University Press, 1997), esp. Thierry Bonzon and Belinda Davis, "Feeding the Cities," 305-341; Jay Winter and Jean-Louis Robert, eds., *Capital Cities at War: Paris, London, Berlin 1914-1919*, vol. 2 (New York: Cambridge University Press, 2007), esp. Catherine Rollet's chapter on "The Home and Family Life," 315-353; Belinda J. Davis, *Home Fires Burning: Food, Politics, and Everyday Life in World War I Berlin* (Chapel Hill: University of North Carolina Press, 2000); Anne Roerkohl, *Hungerblockade und Heimatfront: die kommunale Lebensmittelversorgung in Westfalen während des Ersten Weltkrieges* (Stuttgart: Franz Steiner, 1991); Roger Chickering, *The Great War and Urban Life in Germany, Freiburg, 1914-1918* (New York: Cambridge University Press, 2007).

⁵⁷³ Matthias Erzberger, *Schädigung der deutschen Volkskraft durch die feindliche Blockade. Denkschrift des Reichsgesundheitsamtes, Dezember 1918* (Berlin: Gerhard Stalling, 1919), 11, 33. Avner Offer, *The First World War: An Agrarian Interpretation* (Oxford, England: Clarendon Press, 1989); Mary Elizabeth Cox, "War, Blockages, and Hunger: Nutritional Deprivation of German Children 1914-1924," *University of Oxford Discussion Papers in Economic and Social History*, Nr. 110 (Feb. 2013); Matthias Blum, "Government Decisions Before and During the First World War and the Living Standards in Germany During a Drastic Natural Experiment," *Explorations in Economic History* 48, no. 4 (Dec. 2011): 556-567; and for a comparison with the early National Socialist years, Jörg Baten and Andrea Wagner, "Autarchy, Market Disintegration, and Health: The Mortality and Nutritional Crisis in Nazi Germany 1933-1937," *Economics and Human Biology* 1 (2003): 1-18.

Bavaria, shop girls in Berlin, or state hospital residents in Saxony.

Different rations for different regions

The third-largest state in the Reich by population but only fifth in area, the Kingdom of Saxony was also the first and most heavily industrialized state.⁵⁷⁴ This meant dense accumulations of workers, many with dependent families and children. The cessation of international trade during World War I caused a ripple effect through Saxony's business sector, from textile production to graphic design (for labels and advertising), although some of those workers were able to find jobs in war industries making uniforms or armaments.⁵⁷⁵ Unlike Prussia, which could feed the western industrial centers with agricultural products from its eastern agricultural provinces; and unlike Bavaria, with its subjects scattered over large tracts of fertile land, Saxony (pop. density 320/km²) could not sustain a "hypertrophic" urban population with its scant farmland.⁵⁷⁶ Like Germany as a whole, the Kingdom of Saxony was a net-importer of food, especially meat, grain, and eggs.⁵⁷⁷

This fact was not lost on average consumers, afraid of price increases and food shortages, who stormed shops for flour, beans, and salt in the first week of August 1914. "With such actions housewives accomplish just the opposite of what they intend, for bulk purchases such as these ...

⁵⁷⁴ The 1910 census counted 4.8 million inhabitants on 15,000 km² (5,800 mi²). Both population and density had almost doubled since the founding of the Kaiserreich in 1871. Kaiserliches Statistisches Amt, *Statistisches Jahrbuch für das Deutsche Reich*, 32 Jhrg. (Berlin: Puttkammer & Mühlbrecht, 1911), 1. See also Richard Humphrey, "Zweierlei Revolution. Die Industrialisierung Sachsens im Zeichen Großbritanniens (1790 bis 1860)," *Dresdner Hefte* 20, no. 70: Großbritannien und Sachsen—Erfahrungen gemeinsamer Kultur (Feb. 2002): 16-26.

⁵⁷⁵ Before the war, one third of Saxony's industrial workers were in textiles (275,000 out of 858,500), and Saxony had been Germany's leading sugar refiner. Königliches Sächsisches Ministerium des Innern to the Kriegsernährungsamt (Berlin), 23 Aug. 1916, docs. 141-146, Nr. 23197 Lebensmittelversorgung, 10736 Mdl, SHAD.

⁵⁷⁶ Werner Schlegel, *Die Lebensmittelversorgung der Stadt Leipzig während der Kriegs- und Nachkriegsjahre 1914-1924* (diss., Univ. Leipzig, 1930), 13. The population density in Prussia's western provinces ranged from 142/km² in Hessen-Nassau to 204/km² in Westphalia and 264/km² in the Rhineland. Bavaria's population density was 91/km², an average of 158/km² in the Pfalz to the left of the Rhine River and 91/km² for the much larger area to the right of the river. Kaiserliches Statistisches Amt, *Statistisches Jahrbuch* (1911), 1.

⁵⁷⁷ Erwin Scheu, "Die Lebensmittelversorgung der sächsischen Großstädte: eine wirtschafts-geographische Studie," *Schlesische Jahrbücher für Geistes- und Naturwissenschaften* 2, no. 3 (1924); 179-208.

naturally cause an increase in prices,” chided an author in the *Dresdner Hausfrau*, a syndicated weekly magazine.⁵⁷⁸ The women could hardly be reproached, for as Gerald Feldman has shown, the primary culprit of massive purchases at above-market prices was the military, which was given priority in food matters throughout the war.⁵⁷⁹ In the absence of a contingency food plan before the conflict began, civilian leaders fell back on the Prussian Law of Siege (1851), in which the federalized model of the Reich was overlaid with a bureaucracy of military deputies (*stellvertretenden Generalkommandos*). State and local governments were left to set their own policies of price ceilings and monetary or food aid to the poor.⁵⁸⁰ With a free market still largely in place, producers sold where prices were highest. This increasingly tenuous situation continued through the winter of 1914, as swift victory eluded the vaunted German army.

Reich-wide rationing of flour and bread in January and February 1915 introduced socialization of food supply and distribution. But it was an awkward and evolving “war socialism” that tried to incorporate both centralized and decentralized decision-making.⁵⁸¹ In an effort to simplify the problem of feeding 67 million persons, the states were divided into districts responsible for feeding their inhabitants. However, these artificial borders cut across established business relationships and supply chains, making the food economy more complex rather than less. If a district did not produce enough food for itself (*ein Zuschußgebiet*), it was supposed to

⁵⁷⁸ “Die Hausfrauen erreichen durch solches Vorgehen grade das Gegenteil von dem, was sie beabsichtigen; denn derartige Masseneinkäufe an Mehl, Hülsenfrüchten und Lebensmitteln müssen, wenn sie fortgesetzt werden, naturgemäß eine Steigerung der Preise im Gefolge haben.” T., “Sachsentreue in schwerer Zeit,” *Dresdner Hausfrau* 12, no. 46 (14 Aug. 1914): 1-2; and “Der Krieg und die Lebensmittelversorgung,” *DH* 12, no. 48 (28 Aug. 1914): 2. See also Stadtrat Prof. Dr. Philipp Stein, “Zentralisation, Dezentralisation und die Beteiligung privater Vereine,” in *Praktische Durchführung von Massenspeisung*, ed. Zentralstelle für Volkswohlfahrt (Berlin: Carl Heymann Verlag, 1916), 72-74; and Hans Krüger, “Dresdens Lebensmittelverwaltung,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 7/8: Die Nahrungsmittelwirtschaft großer Städte im Kriege, 49-75 (Berlin: Reimar Hobbing, 3 March 1917), 51.

⁵⁷⁹ Feldman, *Army, Industry and Labor in Germany*, 97-101.

⁵⁸⁰ The Reich Law of 1871 had established support for the wives and families of soldiers.

⁵⁸¹ On decentralization, Skalweit, *Kriegsernährungswirtschaft*, 18. To the applause of his fellow Social Democrats, Otto Wels (1873-1939) declared to the Reichstag in July 1919, “We do not want this so-called war socialism, we want true socialism, the socialism of peace.” “Genosse Wels über der Stand der Massenernährung in Deutschland,” *Chemnitzer Volksstimme* Nr. 156 (9 July 1918), doc. 286, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

import overstock from farm-rich areas (*Überschußgebiete*). On their own initiative, these frequently imposed export bans to keep eggs, milk, or livestock for the consumption of their own local populations. Even within Saxony, prices and rations often differed between a large city and its suburbs, or between neighboring towns lying in different districts. When in the summer of 1917 a newspaper in one city bragged that “it was the best-provisioned in Saxony,” drawing ire from residents of other cities, the State Food Office admonished local authorities to suppress such announcements, because it was impossible to provision the whole kingdom evenly.⁵⁸²

By August 1916, the food situation had deteriorated so much that the Ministry of the Interior described the situation in Saxony as “one of such severe need that the *Volkskörper* will doubtless be harmed for the long term.”⁵⁸³ In May, the War Food Office (*Kriegsernährungsamt*, KEA) had been established in Berlin, partly in response to demands from the population that a national “food czar” be appointed to coordinate supply and demand. Actually, its head enjoyed few powers of enforcement, as some decision makers doubted an institution in Berlin could address the variety of local and regional circumstances.⁵⁸⁴ To demonstrate that all urban experiences of rationing were bad but in different ways, let us compare three Saxon cities: the textile town of Ebersbach, the Saxon capital of Dresden, and the trade and publishing center of Leipzig.

Ebersbach is nestled in the southeastern corner of Saxony, right on the border with Bohemia. The municipal leaders of this third largest city in the district of Löbau were so

⁵⁸² Königliches Sächsisches Ministerium des Innern, Landeslebensmittelamt, an die Kommunalverbände, 26 June 1917, doc 70, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁵⁸³ It was “einer so schweren, und den Volkskörper zweifellos auf die Dauer schädigten Not.” Königliches Sächsisches Ministerium des Innern to the Kriegsernährungsamt (Berlin), 23 Aug. 1916, doc. 141-146, Nr. 23197 Lebensmittel-versorgung, 10736 MdI, SHAD.

⁵⁸⁴ “Bekanntmachung über die Errichtung eines Kriegsernährungsamts vom 22.5.1916,” DHM/LeMO [Deutsches Historisches Museum/Lebendiges virtuelles Museum Online], accessed 14 October 2012, <http://www.dhm.de/lemo/-html/dokumente/kea/index.html>. Skalweit, *Kriegsernährungswirtschaft*, 179-186; Davis, *Home Fires Burning*, 114-118; Feldman, *Army, Industry and Labor in Germany*, 110-114. The KEA was led by Adolf Tortilowicz von Batocki-Friebe (22 May 1916-6 August 1917), Wilhelm von Waldow (6 August 1917-9 November 1918), and then Emanuel Wurm (14 November 1918-13 February 1919). In November 1918 it was renamed the Reichsernährungsministerium; in 1919 it was combined with the Reichswirtschaftsministerium and the next year renamed the Reichsministerium für Ernährung und Landwirtschaft (RMEL, Reich Ministry of Food and Agriculture).

effective in regulating the local food economy that they drew outside criticism from business leaders. Most of Ebersbach's 9,500 residents were engaged in the struggling cotton textile industry. In response to their complaints about dishonest shopkeepers, the town council almost completely centralized distribution of both rationed and unrationed goods. The idea was to cut out the private middlemen, reduce consumer prices, and ensure equal access. However, this deprived store owners of their livelihood, so the State Council for Retail Trade (*Landesausschusses des Kleinhandels im Königreich Sachsen*) complained that the town was contravening a Saxon Ministry of the Interior order (Nr. 471 II.B.1.a, 10 Nov. 1915) instructing communities to found municipal associations composed of both government and business interests. The Ebersbach officials protested that they could not imagine a better system, that local business leaders agreed with them, and that to change it now would be unwise.⁵⁸⁵ As the last communication on the matter was a letter of chastisement from the State Food Office (*Landeslebensmittelamt*), one has to assume that the council reluctantly followed the second order to allow the goods it acquired to be sold through the shops, with all the attendant risks of favoritism, price gouging, and under-the-counter deals.⁵⁸⁶

By contrast, Dresden and Leipzig each developed systems that combined public and private organizations, with the former's slanted more toward government control and the latter's more toward business interests. According to a report economist August Skalweit (1879-1960) and Dresden City Councilor Hans Krüger authored for the War Food Office in Berlin in early 1917, Dresden had one of the most organized systems to meet one of the more difficult

⁵⁸⁵ Doc. 43-51, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁵⁸⁶ Prices rose 1,000-1,500% over the course of the war. Uwe Malich, "Zur Entwicklung des Reallohns im Ersten Weltkrieg," *Jahrbuch für Wirtschaftsgeschichte* no. 4 (Oct. 1980): 55-70. Armin Treibel tracks spending on goods and services in Triebel, Armin. "Variations in Patterns of Consumption in Germany in the period of the First World War," in *The Upheaval of War: Family, Work, and Welfare in Europe, 1914-1918*, ed. Richard Wall and J. M. Winter, 159-196 (New York: Cambridge University Press, 1988).

situations: feeding a large city (pop. 550,000, the largest they surveyed) with comparatively little farmland, particularly for the all-important commodity of milk.⁵⁸⁷ Its organization of the production and distribution of flour and bread was supposedly exemplary.⁵⁸⁸

Government involvement in the food marketplace in Dresden had begun in early August 1914 with a Food Committee (*Lebensmittelausschuss*) and a Meat Supply Committee under the War Support Office (*Kriegsunterstützungsamt*) and the slaughterhouse administration, respectively. The Food Committee handed down price ceilings and purchased staples like grains, dried vegetables, legumes, rice, salt, and gasoline to sell from a chain of public shops in order to prevent private shops from charging more than the set price. With the Imperial Bread Grain Order of 25 January 1915, the city created the Municipal Association of Greater Dresden (*Kommunalverband Dresden und Umgebung*) to regulate the production and distribution of grains, flour, and bread; they had to include the suburbs of Dresden-Altstadt, Dresden-Neustadt, and Pirna, because bread was mass produced there for sale in the city. As in other locales around the Reich, ration cards were introduced February 15 to regulate the consumption of bread. By the time the Food Committee reorganized in August 1915 as an independent City Food Office (*Städtisches Lebensmittelamt*), oats, barley, potatoes, and animal fodder were also rationed.⁵⁸⁹

Rather than attempting to socialize the food chain, as in little Ebersbach, or to rule by force and decree, as in Prussian Posen (pop. 2.1 million), in Dresden each branch of the market was syndicated on the model of the Municipal Association.⁵⁹⁰ By 1917, the city had created

⁵⁸⁷ August Skalweit, "Kommunale Ernährungspolitik," in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 7/8: Die Nahrungsmittelwirtschaft großer Städte im Kriege, 1-48 (Berlin: Reimar Hobbing, 3 March 1917). The seven cities the men observed were Dortmund, Dresden, Hannover, Linden, Posen, Straßburg, and Ulm. See also Skalweit, *Kriegsernährungswirtschaft*, 146-162.

⁵⁸⁸ "Die im folgenden Aufsatz gegebene Beschreibung der Dresdener Einrichtung mag als Musterbeispiel dienen." Skalweit, "Kommunale Ernährungspolitik," 29; Franz Dienemann, "Hygienische Kriegsmaßnahmen deutscher Städte. 8. Dresden," *Öffentliche Gesundheitspflege* 3, no. 12 ([Dec.] 1918): 401-419, esp. 405.

⁵⁸⁹ Krüger, "Dresdens Lebensmittelverwaltung," 49-54.

⁵⁹⁰ Skalweit, "Kommunale Ernährungspolitik," 1-9.

limited liability corporations for flour, potatoes, butter/fat, semolina and barley (Eastern Saxony), and the remaining free-market goods (*Warenverteilungs-GmbH*). A private group, the United Milk Merchants, formed to handle the trade in milk. The public-private L.L.C.s, the Price Office, and Food Committee incorporated representatives of many different interest groups: city government, bulk distributors, consumer cooperatives, small shopkeepers, lower- and middle-class housewives, and white-collar employees. Because production, distribution, and price were handled by cooperation among the different interested parties, explained Krüger, the public could know that they were not being cheated and that the matter was being taken care of by experts.⁵⁹¹ Dresden city officials also insisted that the L.L.C.s return the lowest profit possible, using any excess from sales to subsidize prices.⁵⁹²

Particularly impressive was the Municipal Association of Greater Dresden's management of the circulation of ration coupons (*Lebensmittelkarten*). Beyond the L.L.C.s, Price Office, and rations, the Food Office added two further layers of monitoring. On the supply side, locales were divided into flour districts (*Mehlbezirke*), each of which organized the production of flour and bread for itself via "reverse migrating cards" (*rückwandernde Karte*): when purchasing flour or bread, customers turned in their bread stamps to the bakers, who handed them over to the district office in exchange for flour stamps, which the bakers gave to suppliers in exchange for flour. The millers then turned the flour stamps over to the district, which apportioned them raw grain based on how much flour they had been selling and how much grain had been appropriated from farmers. The Municipal Association found that it was able to supply flour much more cheaply by itself than if it purchased from the National Grain Office (*Reichsgetreidestelle*). Each flour

⁵⁹¹ Krüger, "Dresdens Lebensmittelverwaltung," 60.

⁵⁹² For example, in Dresden, bakers earned 40 cents for every kilogram of rye flour they bought and turned into bread, compared to Dortmund, where the bakers made 4.50 M per kg flour! Dresden's bakers made their profits on white bread rather than black. Skalweit, "Kommunale Ernährungspolitik," 41-46.

district was also responsible for disseminating general ration cards and for collecting and sending these to the appropriate suppliers.⁵⁹³

On the demand side, the Food Office eventually instituted customer registers (*Kundenliste*) for popular goods like butter, margarine, pasta, eggs, potatoes, meat, sugar, sweeteners, dried vegetables, semolina, and rare goods like coffee and tea. For example, customers had until Tuesday evening to place their butter orders in an approved shop. The owner transmitted the tendered ration cards to the district flour office on Wednesday. The cards went through the suppliers to the headquarters of the Food Office by Thursday noon. Then the directors had a meeting to divide up the supplies on hand; Krüger admitted that they could usually satisfy only fifty percent of the demand. Then the Butter and Fat Corporation provided the appropriate amounts to the suppliers, who passed these along to the shop owners, and customers had from Saturday until Tuesday to pay for their orders and put a request in for the next week. Whereas throughout the war Berlin residents waited in the infamous “polonaises,” sometimes “dancing” in place for hours to keep warm and hoping a store would have what their ration cards promised, pre-ordering and customer lists reportedly eliminated the infamous “polonaises” in many Saxon cities.⁵⁹⁴ However, while Saxons waited in shorter lines, they still had to spend inordinate amounts of time and energy visiting each shop multiple times per week to acquire each rationed item: first to order, then to pick up, and maybe to return if the delivery had not come in yet.⁵⁹⁵ Krüger and Dienemann say nothing about the wait times for unrationed goods.

The public could be forgiven, therefore, if they harbored doubts about the system’s

⁵⁹³ Krüger, “Dresdens Lebensmittelverwaltung,” 65-67.

⁵⁹⁴ On queuing for food: Caroline Ethel Cooper, Letters 18A, 30 Nov. 1915, 113; 29 A, 13 Feb. 1916, 127; 32A, 5 March 1916, 130; 10C, 7 Oct. 1917, 223-224, *Behind the Lines: One Woman’s War 1914-18. The Letters of Caroline Ethel Cooper*, ed. Decie Denholm (London: Jill Norman & Hobhouse, 1982). On reforms in Saxony: Krüger, “Dresdens Lebensmittelverwaltung,” 68-70; Dienemann, “Hygienische Kriegsmaßnahmen,” 407; Davis, *Home Fires Burning*, 152.

⁵⁹⁵ Cooper, Letter 3C, 19 Aug. 1917, *Behind the Lines*, 215-216.

efficiency. By mid-1915, they had to keep track of up to sixteen different varieties of food stamps. To receive their coupons, the population was divided up by houses and assigned to bread stewards (*Brotvertrauensmänner*), who handed out the cards every month. With a ratio of 1 bread steward to 10 houses, each was supposed to know his customers well enough to root out fraud.⁵⁹⁶ To reduce confusion, in 1917 the Food Office introduced unified cards (*Einheitskarten*): the top half consisted of numbered slips that could be detached and used for whatever rare or irregular goods city announced each week in the newspapers (coffee, tea, and chocolate, or eggs and marmalade in the week before Christmas) while the bottom half consisted of regularly rationed goods: butter/fat, potatoes, pasta. Bread, meat, sugar, and turnips still had their own cards, while milk and semolina coupons went only to the very young or sick.⁵⁹⁷ Not everyone could afford to pay for the rations allotted to them, so the authorities took into account recipients' socioeconomic standing: a yearly household income under 1,900 Marks qualified "individuals of small means" (*Minderbemittelte*) for certain discounts⁵⁹⁸; while the decreasing purchasing power of the middle classes finally led planners to reduce income caps on supplemental rations from 6,000 to 3,000 Marks per year.⁵⁹⁹ Still, some desperate persons took to trading or selling their meat cards for bread or potato cards, since they could usually scrape together enough money for those staples.⁶⁰⁰

⁵⁹⁶ Krüger, "Dresdens Lebensmittelverwaltung," 67; Dienemann, "Hygienische Kriegsmaßnahmen," 406-407; Skalweit, *Kriegsernährungswirtschaft*, 199-200.

⁵⁹⁷ Krüger, "Dresdens Lebensmittelverwaltung," 67, 71-73; and Chapter 5.

⁵⁹⁸ The "bread stewards" apparently also handled special rations of spirits (for cooking/heating). Franz Dienemann, *Mitteilungen des Ärztekollegiums beim städtischen Lebensmittelamt in Dresden*, Nr. 23 (24 Aug. 1919), 3; and Nr. [41], Mitteilung an die Dresdner Herren Ärzte betreffend Kohlen und Nahrungsmittel für Kranke (Sept. 1921), 2, Gruppe A Drucksachen bis Mai 1945, A 256/ II Lebensmittelkarten, 1915-1922, 17.2.1 Drucksammlung, Stadtarchiv Dresden.

⁵⁹⁹ For example, *Mitteilung* Nr. 18 (Jan. 1919), 8; *Mitteilung* Nr. 28 [Spring 1920], 2; *Mitteilung* Nr. 30 (July 1920); *Mitteilung* Nr. [37] (13 Aug. 1921). During the last two years of the war, Dresdeners over the age of 6 in families with an annual income less than 3,100 M received a supplemental 250 g of bread per week. Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 1. und 2. Aufl. (Jena: Gustav Fischer, 1918), 73 und 81.

⁶⁰⁰ Skalweit, *Kriegsernährungswirtschaft*, 207-208. Skalweit was more sanguine about the ability of the poor to find and afford meat and potatoes than Cooper was: Letter 15A, 7 Nov. 1915 and Letter 28A, 6 Feb. 1916, *Behind the*

A number of factors contributed to the success of Dresden's centralized food economy—at least as Skalweit and Krüger presented it in their government report. The capital was the only big city in the relatively fertile region covered by the Eastern Saxon Purchasing Association (*Ostsachsen Einkaufsgesellschaft*), whereas western Saxony had to support three large cities (Leipzig, Chemnitz, Plauen) and numerous other industrial centers.⁶⁰¹ Dresden straddled the Elbe River, and during warmer months it could benefit from shipments down the Elbe from Austria, Hungary, and even Romania. But river traffic was inconsistent, and the city had accepted many refugees from Russia, Austria, and the Balkans.⁶⁰² According to some sources, Dresden's L.L.C.s sometimes only possessed their food supplies on paper, and meat and butter rations were often lower there than elsewhere.⁶⁰³ Some of the difficulty can be traced to the supply. Saxony had few meat animals, and over the course of the war, its dairy herds were sacrificed to provide beef to replace reduced bread rations. In addition, Dresden was not centrally located on the railroads, so deliveries from other parts of Germany were irregular and often had to go through hungry Berlin or Leipzig first.⁶⁰⁴

Although surrounded by the rich farmland of the Prussian Province of Saxony and of the neighboring state of Thüringen, Leipzig also struggled to feed its population from its Saxon hinterlands and irregular deliveries from outside the kingdom. The cities of Leipzig and Halle an der Saale (in the Prussian Province of Saxony) had grown together as industrial centers. However, the internal borders enforced for the purposes of rationing often cut off farmers from

Lines, 109 and 126.

⁶⁰¹ The Eastern Saxon Purchasing Association was a regional arm of the *Zentraleinkaufsgesellschaft* (ZEG) in Berlin. Skalweit, *Kriegsernährungswirtschaft*, 18-23; for the Kriegsgesellschaften, 162-178.

⁶⁰² Dienemann, "Hygienische Kriegsmaßnahmen," 401, 403.

⁶⁰³ For critiques of Dresden's food economy, Schlegel, *Die Lebensmittelversorgung*, 39-40, 49-50.

⁶⁰⁴ Chemnitz was no more connected than Dresden was, and at least once the residents of the capital benefitted from a shipment of eggs destined for Chemnitz and elsewhere that needed to be distributed before they rotted. Page 113 in Ministerium des Innern, Landeslebensmittelamt to the Stadtrat in Chemnitz (Konzept nach Diktat), 27 Aug. 1917, docs. 106-115, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

their urban markets and workers from their places of employment, as one generally had to patronize shops and *Volksküchen* in the same district where one lived. Furthermore, Leipzig's function as a railroad hub meant on the one hand, easier access to shipments than Dresden had, but on the other hand, a greater flux of travelers who had to be provisioned somehow. According to Werner Schlegel's dissertation on the economics of wartime rationing in Leipzig, of all Saxon cities—perhaps among all German cities—this industrial center and bustling travel nucleus suffered the most from the decentralization and compartmentalization of the food system.⁶⁰⁵

Free to set up their communal procurement and distribution centers within the guidelines of the Reich and the state (when these were given out at all), Leipzig city leaders chose to rely heavily on existing business relationships. Established in February 1915 under the Health Department, the Leipzig War Food Office consisted of an administrative office, staffed mostly by city employees, and eventually twenty-four business offices, staffed primarily by businessmen.⁶⁰⁶ Schlegel agreed with city leaders' reasoning that producers would be more willing to bring scarce goods like butter to market if they could sell to familiar, trusted wholesalers rather than to unfamiliar, niggling bureaucrats. Other benefits of this arrangement included the fact that the city did not have to duplicate existing transportation and storage facilities.⁶⁰⁷

That the food economy functioned more smoothly if left primarily in the hands of businessmen rather than civil servants was a lesson the government learned the hard way with the potato economy, which lost the city of Leipzig significant amounts of money during the first half of the war. In the spring of 1915 it purchased a store of potatoes to sell to the poor if the tubers disappeared from the market. However, high price ceilings for producers and subsidized

⁶⁰⁵ Take this with a grain of salt; it provides the context for his positive assessment of the city's management of the situation. Schlegel, *Die Lebensmittelversorgung*, 16.

⁶⁰⁶ The city's rationing apparatus employed 583 persons at its height. Schlegel, *Die Lebensmittelversorgung*, 121.

⁶⁰⁷ Schlegel, *Die Lebensmittelversorgung*, 17-21, 30-32.

prices for consumers benefitted everyone but the municipal middleman. Finally, in October 1916, the Reich began allowing individual households to purchase and store potatoes for the winter; the city only had to supply those with insufficient income and/or cellar space to make one large purchase instead of regular small ones. Participation in this program increased dramatically in the fall of 1917, when almost 70% of Leipzigers exchanged their regular potato cards for the new state potato cards (*Landeskartoffelkarte*) and contracted with farmers whom they could find via newspaper advertisements. With only 170,000 ration-card holders still in the program, the city was relieved of having to find, purchase, transport, store, and distribute as many as 50,000 tons of potatoes for the winter. With the poorly planned centralized economy established by the Reich replaced by something that looked more like a free market, Leipzig actually turned a profit on potatoes until their rationing was lifted in 1920.⁶⁰⁸

According to Schlegel, another benefit of Leipzig's reliance on business practices whenever possible was that the profit motive was stronger than officials' requests that farmers honor an abstract "duty" to urban consumers.⁶⁰⁹ Unlike in Dresden, Leipzig's food offices were encouraged to turn a profit, whether this went to the city or to the private firm conducting business on its behalf.⁶¹⁰ The "moneybags" city (*Pfeffersackstadt*) was able to balance most of its expenses (19 million Marks) with money earned from food sales (17.4 million Marks, including 9.4 million from butter alone). When bread rationing ended in 1924 with a small surplus, Leipzig had the equivalent of 2 million Marks (65,384 Goldmarks) left over despite the hyperinflation. Despite his generally complimentary assessment of the city's management of rationing, Schlegel

⁶⁰⁸ Schlegel, *Die Lebensmittelversorgung*, 100-107, 135-139. Meat was also profitable, while vegetables were not.

⁶⁰⁹ Schlegel, *Die Lebensmittelversorgung*, 39, 49-50.

⁶¹⁰ Private profits were capped at 4-5%, according to the federal rules laid out for *Kriegsgesellschaften*. Nachrichtendienst des Kriegsernährungsamts, *Deutsche Ernährungswirtschaft im Kriege (Vortragsstoff)* (Leipzig: n.p., [1917?]), 17. And indeed, the wholesaler who coordinated Leipzig's butter distribution was awarded 0.2% of the city's profits for that staple food. Schlegel, *Die Lebensmittelversorgung*, 39-40.

acknowledged that this excess amounted to an indirect tax on the populace.⁶¹¹ By contrast, the Food Office of the City of Dresden lost money all but one year between 1914 and 1921, and by the time it folded, it was 39 million Marks in the red. That figure included consumer price subsidies, goods it purchased that the Reich subsequently seized, and wares it had to sell at a loss, either when the fixed price dropped, to empty a rented warehouse, or in advance of spoilage.⁶¹² Schlegel admitted it was unclear whether the rations fulfilled individuals' physiological nutrition needs, but he ventured that the mere fact of the city involving itself in the food economy was a psychological boon to the people.⁶¹³

The bitter taste of rationing

It was precisely these sorts of variations between communities that produced the single most common sentiment in Saxony about the wartime food economy: bitterness (*Erbitterung*). Apparently the people were willing to tolerate the terrible food situation itself (probably not least because many helped themselves extra-legally), but they could not abide the thought that other Germans were not suffering as much as they were. In a February 1917 meeting of the Saxon Nutrition Advisory Council (*Ernährungsbeirat*), the industrial miller Erwin Bienert (1859-1930) from Plauen “confirmed from his own experience that bitterness prevailed among the workers, not solely due to the lack of food and to the high prices, but above all because the situation was better in other counties (*Kreisen*); in particular the munitions and war materiel workers were so much more privileged.”⁶¹⁴ Housewives were bitter that all the available vegetables seemed to

⁶¹¹ Schlegel, *Die Lebensmittelversorgung*, 112-113.

⁶¹² Temper, *Rechnungsabschluß über das 7. Geschäftsjahr des Lebensmittelamtes 16. August 1920 bis 15. August 1921* (Dresden: Dr. Güntzsch Stiftung, 31 July 1922), 9. See also the similarly-titled reports for fiscal years two through six. Dr. Temper says the 39 million Mark figure does not include the results of the flour and bread economy, so it is entirely possible that Dresden also ended in the black, but I have not been able to locate either published or archival sources for the Gemeindeverband Dresden und Umgebung.

⁶¹³ Schlegel, *Die Lebensmittelversorgung*, 127.

⁶¹⁴ “Bienert. bestätigt aus seinen eigenen Erfahrungen, daß vielfach Erbitterung unter den Arbeitern herrsche, aber nicht allein infolge des Mangels an Nahrungsmitteln und der hohen Preise, sondern vor allem deshalb, weil es

find their way to the public kitchens with none left at the market.⁶¹⁵ The common folk in Dresden were bitter that colonial wares shops continued to display unrationed luxury goods in their windows that they could ill afford.⁶¹⁶ Those who had survived illness were “bitterly disappointed” that there was not enough “nutritious and easily digestible food” available to fuel a quick recovery.⁶¹⁷ Urban consumers were bitter that premiums for grain farmers had increased the price of bread, while agricultural workers were “more than bitter” over the epithets applied to them by leftist newspapers and politicians.⁶¹⁸ Finally, both the public and government officials in Saxony were embittered by Berlin’s (perceived) preferential treatment.⁶¹⁹

Actually, some of the greatest Saxon outrage was directed not at the Reich capital but at neighboring Bavaria, in an instance of the rural-urban divide writ large. In June and July 1918, the socialist *Dresdner Volkszeitung* reported on the food situation outside Saxony:

Anyone who does not travel outside Dresden naturally has no idea what the food situation in other parts of the country looks like. He believes the tiny rations and the high prices that are usual in Saxony and in Dresden are the common property of [all] German citizens. In reality it is better in most other parts of Germany. Indeed, the best in Mecklenburg, Schleswig, and in Bavaria.⁶²⁰

anderen Kreisen besser gehe; insbesondere aber die Munitions- und Heeresbedarfsarbeiter bei weitem bevorzugt würden.” Page 127, Niederschrift über die 18. Sitzung des Ernährungsbeirats vom 22. Februar 1917, doc. 118-128, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD. See also p. 12 in Niederschrift über die 20. Sitzung des Ernährungsbeirats vom 22. März 1917, doc. 152-160, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD.

⁶¹⁵ Herr Hartmann on p. 12, Niederschrift über die Sitzung des Ausschusses für Massenspeisung [Berlin] am 9. Dezember 1916, doc. 48-56, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁶¹⁶ “Das erbittert den darbenenden kleinen Mann sehr. Er sieht, wie sich die Reichen immer noch helfen können, während er sich all die schönen Sachen nicht leisten kann.” “In der ‘Freß’gasse,” *Dresdner-Volkszeitung* Nr. 93 (24 April 1918), doc. 59, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁶¹⁷ “In bedauernswerter Lage befanden sich diejenigen, die nach überstandener Krankheit auf baldige Kräftigung und Genesung hofften, bei dem allgemeinen Mangel an nahrhaften und leicht verdaulichen Speisen aber in ihrer Zuversicht bitter enttäuscht wurden.” Erzberger, *Schädigung*, 31.

⁶¹⁸ Niederschrift über die 26. Sitzung des Ernährungsbeirats vom 18. Oktober 1917, doc. 277; in re: Protokoll über die 24. Sitzung des Ernährungsbeirats am Freitag, den 14. September 1917, doc. 232-241, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD; “Zweierlei Maß für Stadt und Land,” *Deutsche Tageszeitung* (Dresden, 13 Aug. 1917), doc. 118, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁶¹⁹ Kriegsamt to the Kriegsministerium, 23 July 1917, doc. 116-117, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD; p. 9, Niederschrift über die 22. Sitzung des Ernährungsbeirates vom 26. April 1917, doc. 182-192, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD.

⁶²⁰ “Wer nicht von Dresden fortkommt, hat natürlich keine Ahnung, wie es in anderen Landesteilen mit der Ernährung aussieht. Er glaubt, die winzigen Rationen und die hohen Preise, die in Sachsen und Dresden

In the kingdom next door, food supposedly was not rationed, prices were one half or one third as high as in northern Germany, and goods were available that other Germans knew only by hearsay anymore, such as eggs. Whereas Berliners suffered “skimpy portions and whopping prices,” and industrial cities in the (Saxon) Vogtland like Zwickau and Reichenbach offered travelers black coffee and no fat rations, in Bavaria one could have coffee with milk for breakfast, lunch with a generous portion of meat, and more than enough butter.⁶²¹ A different observer asked later, “Is it any wonder that a starving Saxon’s temper flared when he heard that the Bavarian allegedly sat down to dishes full of meat?”⁶²²

The same socialist article relied not just on hearsay but also compared what the Reichsstellen provided for Bavaria with what Bavaria provided for other states in terms of millions of eggs, tons of food—and calories.

Expressed in calories ... the quantity of food delivered from the Reich totals 600 billion calories, the amount delivered from Bavaria only 230 billion calories. In other words, the agricultural state of Bavaria, with a population density of 90 persons per square kilometer compared to 320 in Saxony and 120 in Germany as a whole, is receiving food subsidies and still cannot even feed itself.⁶²³

gebräuchlich sind, wären Gemeingut der deutschen Staatsbürger. In Wirklichkeit ist es in den allermeisten anderen Gegenden Deutschlands besser. Am besten wohl in Mecklenburg, Schleswig und in Bayern.” “Verschiedenartige Verpflegungsverhältnisse,” *Dresdner Volkszeitung* Nr. 131 (8 June 1918), doc. 280, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD. Mecklenburg and Schleswig lie in northern Germany, Bavaria in the south.

⁶²¹ “Das einigte Deutschland,” *Dresdner Volkszeitung* Nr. 151 (2 July 1918), doc. 284, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD. This article borrowed heavily from a piece written by a journalist for the *Berliner Lokal-Anzeiger* about a trip through Central Germany. Prof. Kraft reported that an acquaintance told him that in Bavaria, one could buy butter for 2.50 or 3 M and “meat in excess.” Page 7, Niederschrift über die 30. Sitzung des Ernährungsbeirats vom 12. Februar 1918, doc. 46-53, Nr. 23191 Protokolle über Ernährungsbeirats-Sitzungen Bd. 3, 10736 MdI, SHAD. See also reports about the large amounts of food seized from “suspicious” packages being mailed from Bavaria: “In the second half of 1917, 38,000 impounded packages were found to contain 318 hundredweight cheese, 267 hundredweight butter, 56 hundredweight lard, 518 hundredweight flour, 12 hundredweight sugar, 995 hundredweight meat, 103 hundredweight honey, 358 hundredweight assorted foodstuffs and 133,023 eggs. And that is with only a small portion of the packages sent from Bavaria being searched. From these numbers it follows that Bavaria is better supplied with food than all the other regions of Germany.” “Was beschlagnahmt wird,” *Dresdner Volkszeitung* Nr. 138 (17 Jan. 1918), doc. 282, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD. A hundredweight equaled 50 kg, or about 110 lbs, such that authorities seized 15 tons of butter and 55 tons of meat. If this food did not spoil or disappear into the black market, it often went to the soup kitchens.

⁶²² “Konnte man sich darüber wundern, daß es den hungernden Sachsen verstimmte, wenn er horte, daß angeblich der Bayer bei vollen Fleischtopfen säße?” Skalweit, *Kriegsernährungswirtschaft*, 164.

⁶²³ “In Kalorien ausgedrückt, stellt sich das Verhältnis für Bayern noch ungünstiger (d. h. also eigentlich günstiger),

The conflation of familiar economic terms like weights with the (theoretical) amount of energy contained in them is not all that surprising, considering the degree to which the population was being schooled in quantitative nutritional physiology as rations were handed down, justified, and revised. Like many Saxons in and out of government, this writer had adopted the utilitarian language of rations based not on population but on population density, which served as a proxy for the two states' relative contributions to the war effort. Critics like this one expected a more even exchange of Saxony's munitions manufactures for Bavaria's agricultural abundance. "Ja, ja: Germany should be united," he concluded. "Every German wishes all Germans well—but the best for himself!"⁶²⁴

Although World War I rationing enacted the idea(l) of a paternalistic government caring for its citizens on an unprecedented scale, we can see that "fair" did not and could not mean "equal" distribution of foodstuffs, due to the diverse geography and demography of the German Empire. Industrialized Saxony relied on more agricultural parts of Prussia and Bavaria the same way a body's muscles rely on its heart and lungs. Although Germany as a whole grew sufficient potatoes to meet domestic need, Saxon merchants had to buy mostly from Prussian farmers. The Municipal Association of Greater Dresden's ability to produce enough grain to satisfy its demand seems to have been unique in Saxony, but the dire shortage of imported meat was a constant concern for officials and consumers alike. Saxony had enough dairies to produce ample milk for its subjects, but only if the farmers could purchase fodder grown elsewhere.⁶²⁵ Prior to

denn die vom Reich gelieferte Nahrungsmittelmenge macht 600 Milliarden Kalorien aus, die bayrische nur 230 Milliarden, mit andern Worten: der Agrarstaat Bayern mit einer Bevölkerungsdichtigkeit von 90 Köpfen auf den Quadratkilometer gegen 320 in Sachsen und etwa 120 im Reich ist ein landwirtschaftliches Zuschußland, das nicht einmal sich selbst ernährt." Doc. 280, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁶²⁴ "Ja, ja: ein einig Deutschland soll es sein. Jeder Deutsche gönnt allen Deutschen Gutes,—sich aber das Beste!" "Das einige Deutschland," *Dresdner Volkszeitung*.

⁶²⁵ See e.g. Königliches Sächsisches Ministerium der Innern, to the Kriegsernährungsamt (Berlin), 23 Aug. 1916, docs. 141-146, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD; and repeated discussions in Nr. 23189-

the war, business relations for everything from fertilizer to butter to canned peas had bound Germany together and to foreign countries through intra- and international trade. The blockade progressively severed international ties to the global food market, while marshal law and the federalized rationing system dissected the internal food chain.

Rather than make Germans more equal, the philosophy of “to each his own” (*jedem das seine*) had the opposite effect, and everyone was sure that they had it worst.⁶²⁶ As a subsidized district, Saxony did endure lower rations than surplus districts like Bavaria and—on paper at least—the metropolitan area of Berlin. The highest government officials seem to have calculated that it was necessary for their comfort and the maintenance of order to declare somewhat higher rations for the capital than for this industrialized middle-German state, despite its importance to the war effort. Even as hard(est)-working workers were granted extra rations under the prevailing utilitarian wartime economic philosophy, Saxony could not replicate this feat on the state level, for no authority was willing or able to wring sufficient supplies from producing areas like Bavaria or Silesia. Consequently, Saxony’s residents suffered physically: “the bitter need of the subsidized districts” expressed itself in widespread malnutrition, wrote the State Food Office to the War Food Office in Berlin.⁶²⁷ They also suffered psychologically: “We Saxons have helped make the Reich great and defend it gladly with our lifeblood. But at the same time, when it comes to the question of nutrition, we seem to be second-class citizens.”⁶²⁸ According to the Stadtrat who served as chief business officer of the Committee for Public Kitchens in Dresden, this suffering united Saxons against other Germans: “As different as the food stores and import

23191 Protokolle über Ernährungsbeirats-Sitzungen Bd. 1-3, 10736 MdI, SHAD.

⁶²⁶ Skalweit, *Kriegsernährungswirtschaft*, 209.

⁶²⁷ Page 10 of Königliches Sächsisches Ministerium des Innern, Landeslebensmittelamt, to the Kriegsernährungsamt (Berlin), 1 May 1918, docs. 158-160, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

⁶²⁸ “Wir Sachsen haben das Reich groß zu machen geholfen und verteidigen es freundlich mit unserm Herzblut. Aber in der Ernährungsfrage scheinen wir gleichsam Reichsbürger zweiter Klasse zu sein.” “Wer soll fürbitten?” *Leipziger Volkszeitung*, Nr. 153 (4 July 1918), doc. 285, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD.

logistics of Leipzig, Dresden and Chemnitz may be, we Saxons at least are united by the general scarcity of the main foodstuffs: potatoes and fat.”⁶²⁹ Sentiments such as these reveal the disintegration of the social body around the issue of food that unquestionably contributed not just to the revolution in 1918 but also to the state of near-civil war that followed.

⁶²⁹ “Wir Sachsen wenigstens werden alle—so verschieden sonst die Vorrats- und Zufuhrverhältnisse von Leipzig, Dresden und Chemnitz liegen mögen—bei dem allgemeinen Mangel der Hauptnahrungsmittel—Kartoffeln und Fett—darin einig sein.” Stadtrat Dr. Matthes, “Die Abgrenzung des Besucherkreises,” in *Praktische Durchführung von Massenspeisung* ed. Zentralstelle für Volkswohlfahrt, 55-65 (Berlin: Carl Heymann Verlag, 1916), 56. Matthes was the business officer at the head of the Soup Kitchen Committee (*Ausschuss für Volksküchen*) in Dresden.

Chapter 4: The Politics of the Family Table during World War I

Rumford Soup with Peas.

To ½ pint dried shelled peas add ½ pint barley, some raw peeled potatoes, carrots or even a piece of a ripe pumpkin, ½ pound of beef heart, giblets or other meat, [and] onion caramelized in fat. Or add to the barley, peas and potatoes, [add] kohlrabi, lettuce, tripe, smoked meat, onion, pepper, marjoram, etc.

Boil legumes, pearl barley, vegetables and roots, potatoes, some old bread and any meat, all cut into pieces, somewhat salted and with appropriate seasoning plus bacon or fatty bones, in a sealed pot with soft water at a moderate heat, making a thick, viscous, robust dish, to which one adds old bread cut into cubes and fried in a little fat before serving.⁶³⁰

“The Seven Laws of the War Kitchen”⁶³¹

Eat war bread!
Cook potatoes in their skins!
Don't buy cake!
Be smart, save fat!
Cook with a cooking-box!
Cook with a war cookbook!
Help win the war!

⁶³⁰ “Man kocht Hülsenfrüchte, Graupen, Gemüse und Wurzeln, Erdäpfel, etwas altgebackene Semmel und beliebiges Fleisch, alles zu Stücken geschnitten, etwas gesalzen mit passender Würze und Speck oder fetten Knochen in einem verschlossenen Geschirre mit weichem Wasser bei mäßiger Hitze, wodurch eine dickliche, schleimige, kräftige Speise wird, in die man beim Anrichten altgebackenes Brot würfelig geschnitten mit etwas Fett geröstet gibt.

“Mit Erbsen. Zu ½ Seidel getrockneten enthülsten Erbsen gibt man ½ Seidel Gersten, einige roh geschälte Erdäpfel, gelbe Rüben oder auch ein Stück von einen reifen Kürbis, ½ Pfund Rindsherz, Gekröse oder auch anderes Fleisch, mit Fett angelaufene Zwiebel. Oder auch zu Gerste, Erbsen und Erdäpfeln, Kohlrabi, Salat, Kuttelflecke, geräucher-ertes Fleisch, Zwiebel, Pfeffer, Majoran u. dgl.” For ease of understanding I have reversed the order of the two paragraphs, in order to list the ingredients before the cooking directions. Katharina Prato, *Die Süddeutsche Küche auf ihrem gegenwärtigen Standpunkte mit Berücksichtigung des Thee's und einem Anhang über das moderne Servieren. Für Anfängerinnen sowie praktische Köchinnen*, 7. verb. Aufl. (Graz: August Hesse's Buchhandlung / August Zimmermann, 1885), 82. With sincere thanks to Fr. Dr. Giesele Framke and Fr. Ophoven at the Dortmund Kochbuch Museum.

⁶³¹ “Eßt Kriegsbrot! Kocht Kartoffeln in der Schale! Kauf keinen Kuchen! Seid klug, spart Fett! Kocht mit Koch-Kiste! Kocht mit Kriegs-Kochbuch! Helft den Krieg gewinnen!” “Die 7 K-Gesetze der Kriegsküche,” *Dresdner Hausfrau* 13, no. 20 (12 Feb. 1915), 2.

In May 1916, the Social Democratic newspaper the *Leipziger Volkszeitung* weighed in on the debate about “collective feeding” (*Massenspeisung*) with an anecdote from the history of hygiene and of charitable food programs. According to its leftist reporter, an American expatriate by the name of Benjamin Thompson Count von Rumford (1753-1814) had devised a soup out of ground bones and cheap vegetables (mostly turnips) to dispense to the indigent on the public dole in late eighteenth-century Bavaria.⁶³² Instead of being grateful, the poor quickly had refused to eat the stuff. Government officials had chalked this up to their moral depravity, but nutritional scientists eventually demonstrated that “Rumford soup” had essentially no nutritional value.⁶³³ Now that local governments and philanthropic organizations around Germany were collaborating to run soup kitchens (*Volksküchen*), concluded the writer, it was important that they ensured there was enough food to provide wholesome and well-cooked meals. “Otherwise one shouldn’t get involved in experiments like Rumford’s,” the newspaper warned.⁶³⁴

Sometimes those “experiments” were unintentional. Ignorant of its reputation as welfare food, Baroness Horn had put Rumford soup on the menu when Munich opened its war soup kitchens in 1914. Even though her version was more likely to have resembled the hearty recipe given above than the thin gruel described by that newspaper writer, it was extremely poorly received due to its ignominious reputation. It is safe to say that, unlike during World War II,

⁶³² Fritz Redlich, “Science and Charity: Count Rumford and His Followers,” *International Review of Social History* 16, no. 2 (Aug. 1971): 184-216, recipes on 190-191; Eckart Reidegeld, “Naturlehre, Ökonomie und Armenpflege—Vom Wesen und von der Bedeutung einer sozialreformerischen Innovation,” *Zeitschrift für Sozialreform* 46, no. 6 (June 2000): 548-566.

⁶³³ The original recipe contained no meat and was flavored with salt and vinegar. The author of the *Volkszeitung* article has conflated Rumford’s potato soup with a similarly ignominious episode from French nutritional history. In 1815 the Gelatin Commission at the Academy of Paris declared gelatin made from boiling bones a cheap alternative to meat. (It is not.) This recommendation was only retracted thirty years later when the commission’s lead scientist, François Magendie, changed his mind. Elmer Verner McCollum, *A History of Nutrition: The Sequence of Ideas in Nutrition Investigations* (Boston: Houghton Mifflin Company & The Riverside Press), 75-83.

⁶³⁴ “Sonst nicht, denn auf Experimente a la Rumford darf man sich nicht einlassen.” “Massenspeisung,” *Leipziger Volkszeitung* Nr. 113 (24 May 1916), doc. 11, Nr. 23200 Massenspeisung Bd. 1, 10736 Ministerium des Innern, SHAD.

German officials of the Kaiserreich did not intentionally starve anyone during this conflict as a matter of pre-meditated official policy.⁶³⁵ However, some unintended oversights—for instance of residential institutions—over time did become conscious, utilitarian decisions to favor groups of individuals such as workers in ammunition factories who were perceived as contributing the most to the nation and its war effort, over other individuals, such as prisoners or patients with mental illness or physical disabilities, who were perceived as drains on communal resources.

Meanwhile, the collective experience of Denmark—a neutral country caught behind the blockade—was characterized as a “low protein experiment on a national scale” that involved changing the eating habits of a population of 3 million from omnivorous to vegetarian.⁶³⁶ In 1917 Mikkel Hindhede (1862-1945), the physician at the head of the National Laboratory for Nutrition Research in Copenhagen, convinced the beleaguered Danish government that the only way to prevent widespread starvation was to slaughter the country’s herds of livestock and feed the grains and potatoes that would have been used as fodder to the human population instead. While rural farmers could eat the pigs they raised, the urban population subsisted on “bran bread, barley porridge, potatoes, greens, milk and some butter.”⁶³⁷ Most Germans came around to this position only gradually and reluctantly, although the head of the Kaiser Wilhelm Institute for the Physiology of Work in Berlin, Max Rubner, never did. “For better or worse,” reflected economist August Skalweit a decade later, “Germans became vegetarians during the war.”⁶³⁸ Only Germany’s experiment with a low- or no-meat diet was entirely unplanned.

⁶³⁵ Matthias Blum, “Government Decisions Before and During the First World War and the Living Standards in Germany during a Drastic Natural Experiment,” *Explorations in Economic History* 48, no. 4 (Dec. 2011): 556-567.

⁶³⁶ Svend Skaftø Overgaard, “Mikkel Hindhede and the Science and Rhetoric of Food Rationing in Denmark, 1917-1918,” in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alan Drouard, 201-216 (Farnham, Eng.: Ashgate, 2011).

⁶³⁷ Mikkel Hindhede, “The Effect of Food Restriction during War on Mortality in Copenhagen,” *JAMA* 74, no. 6 (7 Feb. 1920): 381-382.

⁶³⁸ “Wohl oder übel war der Deutsche während des Kriegs zum Vegetarier geworden.” August Skalweit, *Die deutsche Kriegsernährungswirtschaft* (New Haven: Yale University Press, 1927), 193.

Eating less meat was hardly the only dietary change Germans experienced during World War I, as their relationship to food production and consumption fundamentally altered.⁶³⁹ Other scarce foods included sources of fat and protein like butter, lard, whole milk, and eggs; during the “Turnip Winter” of 1916-1917, potatoes infrequently made it to market—and the following summer, even the turnips (rutabagas) began to run out. Germans ate more whole-grain bread and more vegetables (both fresh and dried). They drank chicory instead of bean coffee and tea from local plants instead of from India or China. (The lack of coffee and milk was particularly difficult for Saxons.⁶⁴⁰) Rationing meant housewives could only purchase certain amounts of certain foods within a given period of time: bread by the day, meat by the week, oats by the month. The customer lists or pre-order systems used throughout Saxony also meant they could only purchase from certain shops at certain times. Another change that was discussed widely if implemented more narrowly was “community feeding” (*Gemeinschaftsspeisung*) in city kitchens (*Stadtküchen*), “war mess halls” (*Kriegsspeisehäuser*), or factory cafeterias (*Kantinen*).⁶⁴¹

This chapter uses government efforts to alleviate the food shortage during and after World War I to demonstrate the layers of belonging and complexity that could be interposed between “the individual” and “the state” in the telescopic body. For discussions of Massenspeisung crystallized contemporary economic, political, and social issues: In search of the best use of scarce food and labor resources, could some women’s skilled work with modern appliances in communal kitchens redeem other women’s unskilled work with traditional tools in

⁶³⁹ Mikuláš Teich, “Science and Food during the Great War: Britain and Germany,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 213-234 (Atlanta: Rodopi, 1995); Hans Jürgen Teuteberg, “Food Provisioning on the German Home Front, 1914-1918,” in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, 59-72 (Farnham, Eng.: Ashgate, 2011).

⁶⁴⁰ Franz Dienemann, “Hygienische Kriegsmaßnahmen deutscher Städte. 8. Dresden,” *Öffentliche Gesundheitspflege* 3, no. 12 ([Dec.] 1918): 409-410.

⁶⁴¹ Massenspeisung “is not a nice word” and had come to mean many different things during the war. Hans Krüger, “Die Massenspeisung,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegs-ernährungsamts, Heft 14: Die Massenspeisugen, 1-31 (Berlin: Reimar Hobbing, mid May 1917), 1.

their home kitchens? Who could or should in eat public? Above all, would government support of collective food preparation—most notably by assigning priority for food deliveries, first to soup kitchens and then to canteens—devalue the cultural and moral importance of the family table (*Familientisch*)?

As I suggested in the Introduction, late-nineteenth- and early twentieth-century Germans invested “the family” with great cultural importance, as represented by meals cooked and consumed together. “The stove serves as the center and gathering place for family, kin, and wards, and what the hearth was in earlier times the dinner table is today,” wrote Johann Jacob Weber (1803-1880) in his popular *Universal Lexikon der Kochkunst*.⁶⁴² At the table, the family was constituted by its members sitting and eating with one another; it included the diners whether related by blood, marriage, or care. At the table, food nourished bodies and conversation strengthened morals. By preparing and presiding over the family’s meals, women fulfilled a housewifely and motherly duty. Parents had a responsibility to feed their children and to raise them with proper manners. And much as the monarch served as the fatherly head of state and nation, so the *Hausvater* provided for the material well-being of the household and sat at the head of the table. In this way, the family was (meant to be) a microcosm of society in the Kaiserreich. Even as industrial work schedules and restricted means interfered with the all-important midday meal, working-class Germans strove to enact this ideal as much as their

⁶⁴² “Der Herd bildet geradezu dem Mittelpunkt und Vereinigungsort für Familie, Sippe und Schützlinge, und was früher die Feuerstelle war, ist heute der Tisch des Hauses,” J. J. Weber, *Universal Lexikon der Kochkunst*, 9. Aufl. (Leipzig: Verlagsbuchhandlung J. J. Weber, 1913); as quoted in Annemarie Wilz, “»Für Geist und Gemüth« Lexika im Bestand des Deutschen Kochbuchmuseums,” in *Man nehme...Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 11-25 (Bielefeld: Regionalgeschichte, 1998), 21. For Germans living in small apartments, this was for the more practical reason that the kitchen was often the largest room; if there was a parlor, it was used only for Sundays and special occasions. Karen Hagemann, “Of ‘Old’ and ‘New’ Housewives: Everyday Housework and the Limits of Household Rationalization in the Urban Working-Class Milieu of the Weimar Republic,” *International Review of Social History* 41, no. 3 (Dec. 1996): 305-330, here 315.

middle-class counterparts.⁶⁴³ These were the politics of the table in Germany on the cusp of World War I.

The war wrought intense changes both in German society and in the ways in which Germans talked about each other as members of one nation. “We can say that on the day of mobilization [2 August 1914], the society that had existed until then was reshaped into a community,” remembered Heidelberg economist Emil Lederer (1882-1939) in 1915.⁶⁴⁴ The August Days brought crowds into the streets of Berlin to hear the Kaiser proclaim the German Empire had no more political parties, just one people (*Volk*) “standing together like brothers.”⁶⁴⁵ Great numbers of men were mustered from around the Reich and deployed primarily to its western and eastern edges, where they were wounded and killed by the millions, while laborers of both sexes left other jobs to work in factories producing war materiel. Heady early fraternalism eventually gave way to calculations about sacrifice and loss.⁶⁴⁶ As the war dragged on, crowds of women at ration card distribution centers and in front of shops increasingly threatened to devolve into riots. Total war required the many to work and fight as one. Did they need to cook and eat as one as well?

Public kitchens but private tables

In an effort to avoid charges of war-mongering, the Central Powers had done little in the

⁶⁴³ Keith R. Allen, *Hungrige Metropole: Essen, Wohlfahrt und Kommerz in Berlin* (Hamburg: Ergebnisse, 2002).

⁶⁴⁴ “Wir können sagen, daß sich am Tage der Mobilisierung die Gesellschaft, die bis dahin bestand, in eine Gemeinschaft umformte.” As quoted in Christoph Nübel, *Die Mobilisierung der Kriegsgesellschaft: Propaganda und Alltag im Ersten Weltkrieg in Münster* (Münster: Waxmann Verlag, 2008), 14. See also C. Paul Vincent, *The Politics of Hunger: The Allied Blockade of Germany, 1915-1919* (Athens, OH: Ohio University Press, 1985), 15-17.

⁶⁴⁵ “Der Kaiser spricht zu seinem Volk (Zum Bild auf der ersten Umschlagseite),” *DH* 12, no. 46 (14 Aug. 1914): [i]. On the front cover is the familiar photo of the crowd listening to the emperor speaking from the balcony of the castle. The next week the magazine reported on “the historic meeting of the Reichstag from August 1914” at which a “peace among the political parties” (*Burgfrieden*) was declared. “Ein Reich—ein Volk,” *DH* 12, no. 47 (21 Aug. 1914), [i]. See also Peter Fritzsche, “July 1914,” in *Germans into Nazis* (Cambridge, MA: Harvard University Press, 1998), 11-82.

⁶⁴⁶ For a nuanced discussion of the myth of universal enthusiasm and its uses during and after the war, Jeffrey Verhey, *The Spirit of 1914: Militarism, Myth, and Mobilization in Germany* (Cambridge: Cambridge University Press, 2000).

way of provisioning their armed forces, and on the assumption that any war would be short, the they had made no plans for the provisioning of civilians. Early panic was replaced by confidence that Germany could not be starved out and then by reassurances that supplies would last *if* the people bought less, ate less, and wasted less: “No one need go hungry, but everyone must economize!” and “Speech is silver, but chewing is gold!”⁶⁴⁷ Unfortunately, the Eltzbacher Report with all its calculations of imported and domestically produced calories was written as a warning but received as an assurance,⁶⁴⁸ so when the government finally instituted bread rationing in early 1915, it blamed the thoughtless masses for buying white bread and cake instead of its own ignorance about the grain supply due to lack of accurate agricultural statistics.⁶⁴⁹

“Sugar has got very scarce”—wrote a woman in Leipzig in early 1916—“as each thing disappears we say, ‘Now that is serious’, but somehow we get along alright in spite of it.”⁶⁵⁰ From the very first week of the war, Germans had complained about the difficulty of the situation, and they were sure it could not get worse.⁶⁵¹ It usually did. Faith in the vaunted Teutonic ability to organize lasted until late 1915, when food unrests began.⁶⁵² In response, the government issued butter, meat, and milk cards and prohibited the sale of meat and fat on two days of the week each (Table 4.4). The food supply deteriorated the next winter (1916-1917), when even the turnips became scarce. By early 1917, “Germany has at last ceased to trumpet the

⁶⁴⁷ Aphorisms quoted in Skalweit, *Kriegsernährungswirtschaft*, 28.

⁶⁴⁸ Paul Eltzbacher, ed., *Die deutsche Volksernährung und der englische Aushungerungsplan* (Braunschweig: Friedrich Vieweg & Sohn, 1914).

⁶⁴⁹ Ethel Cooper, Letter 27, 1 Feb. 1915, *Behind the Lines: One Woman's War 1914-18. The Letters of Caroline Ethel Cooper*, ed. Decie Denholm (London: Jill Norman & Hobhouse, 1982), 55; Skalweit, *Kriegsernährungswirtschaft*, 30-32.

⁶⁵⁰ Cooper, Letter 32A, 5 March 1916, *Behind the Lines*, 130.

⁶⁵¹ E.g. Dr. [K. G.] Bruchholz, “Zur Beachtung!” *Sächsische landwirtschaftliche Zeitschrift*, Nr. 32 (8 Aug. 1914): 472; T., “Sachsentreue in schwerer Zeit,” *DH* 12, no. 46 (14 Aug. 1914): 1-2.

⁶⁵² In Chemnitz: Cooper, Letter 13A, 24 Oct. 1915, *Behind the Lines*, 107; in Leipzig: Letters 15A, 7 Nov. 1915, 109; 40A, 30 April 1916, 138-139; and 47A, 18 June 1916, *Behind the Lines*, 144. Stephan Pfälzer, “Der ‘Butterkrawall’ im Oktober 1915. Die erste größere Antikriegsbewegung in Chemnitz,” in *Demokratie und Emanzipation zwischen Saale und Elbe: Beiträge zur Geschichte der sozialdemokratischen Arbeiterbewegung bis 1933*, ed. Helga Grebing, Hans Mommsen, and Karsten Rudolph, 196-201 (Essen: Klartext, 1993).

fact that it can't be starved out," and a lawlessness regarding food regulations reigned.⁶⁵³

With the benefit of hindsight and a decade's remove from the turmoil, August Skalweit averred that Germany had lost the economic war by the summer of 1916 already; both its food supply and its agriculture were just too dependent on foreign imports of grain, fodder, and fertilizer.⁶⁵⁴ However, this fact was uncertain at the time, as bureaucrats, businesses, unions, and civilians performed a complicated dance of public rhetoric and private negotiations in an attempt to "hold out" (*durchhalten*).⁶⁵⁵ For example, the War Food Office (*Kriegsernährungsamt*, KEA) in Berlin was created in response to public pressure just as a national discussion was taking place about soup kitchens and other forms of collective feeding.⁶⁵⁶ One observer confided in a letter,

we hear that the days of cooking are numbered—that public kitchens are to be started, and that everybody, poor or rich, is to get their food from them. It is an attempt to equalize things, and to prevent the rich from buying up everything by fair means or foul (generally the latter).⁶⁵⁷

This Reich-wide movement combined the existing practice of charity for the poor, the relatively young concept of "household economy," and the pressing need for more equal distribution of an absolute shortage of food. In government meetings, newspaper articles, and at a two-day conference in Berlin attended by a thousand representatives from around the country, Germans discussed how to provision the kitchens, if ration coupons should be required, and whether the overwhelmingly female labor should be volunteer (*ehrenamtlich*) or paid. Of particular interest was the relative importance of communal cooking versus communal eating: who should cook,

⁶⁵³ Cooper, Letter 27B, 4 Feb. 1917, *Behind the Lines*, 181.

⁶⁵⁴ "Ernährungswirtschaftlich war der Krieg bereits zu Beginn des dritten Kriegsjahres verloren." Skalweit, *Kriegsernährungswirtschaft*, 3.

⁶⁵⁵ E.g. Gerald D. Feldman, *Army, Industry and Labor in Germany, 1914-1918* (Princeton: Princeton University Press, 1966).

⁶⁵⁶ Skalweit, *Kriegsernährungswirtschaft*, 40-49, 179-186.

⁶⁵⁷ Cooper, Letter 12B, 22 Oct. 1916, *Behind the Lines*, 163. Some observers worried more about the munitions workers with their rising wages and increasing purchasing power, since there were so many more of them than there were wealthy Germans. Dr. Georg Wilhelm Schiele, "Ob der Reiche dem Armen das Brot wegessen kann?," *Naumburger Brief*, Nr. 2 (14 May 1917), doc. 19, Nr. 23197 Lebensmittelversorgung im Kriegsjahr 1917 Allgemeines, 10736 MdI, SHAD.

and where should Germans eat?

As the example of Rumford soup shows, August 1914 was hardly the first time German governments had cared for the nutritional situation of their citizens. After repeated grain harvest failures in the eighteenth century, Frederick the Great famously urged Prussians to adopt a certain fleshy member of the nightshade family (the potato), which eventually became a staple of “traditional” German cuisine.⁶⁵⁸ A mix of public and private efforts continued to feed the hungry throughout the nineteenth century, and by 1917 “potatoes provide[d] the backbone of every mass feeding.”⁶⁵⁹ What was new about collective feeding during World War I was that it was carried out on a larger scale and for more complicated reasons of wartime politics (to keep the restive masses fed and therefore quiet), economics (to manage scarce resources for everyone and not just for the poor), hygiene (to reduce malnutrition and slow the increase in active tuberculosis).⁶⁶⁰ Chapter 5 will explore the reasoning behind differential rations for the sick, so in this section I focus on how debates about cooking out and eating in affirmed the social conditions of eating—especially at the family table—as the next level of abstraction in the telescopic body above the eating (and drinking) individual.

When the war began, public and private soup kitchens expanded existing services for school children, the sick, and the poor to include soldiers’ families and the newly unemployed.

⁶⁵⁸ William H. McNeill, “How the Potato Changed the World’s History,” *Social Research* 66 (Spring 1999): 72-78; Hans-Jürgen Teuteberg and Günther Wiegmann, “Einführung und Nutzung der Kartoffel in Deutschland,” in Teuteberg and Wiegmann, *Unsere tägliche Kost: Geschichte und regionale Prägung*, 93-134 (Münster: F. Cöpppenrath, 1986).

⁶⁵⁹ “Die Kartoffeln bilden das Rückgrat jeder Massenspeisung.” Qtn on p. 3, Der Präsident des Kriegsernährungsamts [actually signed by Unterstaatssekretär Friedrich Edler von Braun (1863-1923)] to sämtliche Bundesregierungen, 24 Aug. 1917, doc. 76-77, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD. One pioneer of private initiatives to feed the hungry was Lina Morgenstern (1830-1909), a Jewish philanthropist who founded Berlin’s first Volksküche (1866) and the Berlin Hausfrauen Verein (1873). Reinhold Kruppa, *Lina Morgenstern: “Social couragiert und frauenbewegt.” Ein Berliner Lebensbild* (München: GRIN Verlag, 2008); Allen, *Hungrige Metropole*; Meinolf Nitsch, *Private Wohltätigkeits-Vereine im Kaiserreich: Die praktische Umsetzung der bürgerlichen Sozialreform in Berlin* (Berlin: W. de Gruyter, 1999).

⁶⁶⁰ Werner Schlegel, *Die Lebensmittelversorgung der Stadt Leipzig während der Kriegs- und Nachkriegsjahre 1914-1924* (Inaugural-Dissertation, Univ. Leipzig, 1930); Anne Roerkohl, *Hungerblockade und Heimatfront: die kommunale Lebensmittelversorgung in Westfalen während des Ersten Weltkrieges* (Stuttgart: Franz Steiner, 1991).

Take the example of Dresden. Before the war, the capital had 8 charitable kitchens serving about 1,300 meals per day.⁶⁶¹ When organizations such as the Dresden General Office for Youth Welfare (*Zentrale für Jugendfürsorge*) expanded the clientele of their food programs in August 1914 by asking school teachers to identify the children of active-duty soldiers who needed hot meals, they were trying to solve the narrow problem of an individual (family) unable to afford to buy enough food due to lost income and rising prices.⁶⁶² By the end of August, 6,000 military dependents and unemployed workers had been helped, and at least 4,000 more were expected to join the rolls in early September.⁶⁶³ On 8 October 1914, 51 soup kitchens—operating at 94% of capacity—served 8,858 portions, and two more kitchens were slated to open.⁶⁶⁴ Over the course of the war, the new Committee on Soup Kitchens (*Ausschuß für Volksküchen*) coordinated with the War Organization of Associations in Dresden (*Kriegsorganisation Dresdner Vereine*) and the City Food Office to provision 274 central kitchens, school kitchens, temperance kitchens, “middle-class kitchens” (*Mittelstandsküchen*), “Soup Kitchens for Everyone” (*Volksküchen für jedermann*), and mobile kitchens (the so-called “Gulaschkanonen”).⁶⁶⁵ On the single day with the highest attendance—17 April 1918—an astounding 117,101 portions were served in Dresden’s

⁶⁶¹ An estimation from yearly figures in Dienemann, “Hygienische Kriegsmaßnahmen,” 410. In 1913, Dresden’s 8 soup kitchens served 414,937 meals, and in 1914, 448,178; assuming the kitchens were closed on Sundays and holidays, we can estimate they served 1,338 and 1,445 meals per day, 310 days per year. Leipzig’s 9 municipal soup kitchens served more than twice that, at 1,003,555 meals in 1914, for an average of 3,237 portions per day. Landesgesundheitsamt Sachsen, *Dritter Jahresbericht des Landes-Gesundheitsamtes über das Gesundheitswesen in Sachsen auf die Jahre 1914-1918* (Dresden: [Vogel], 1921), 147-148.

⁶⁶² Käthe Dornan, “Volksküchen in Dresden für die Familien der Kriegsteilnehmern,” *DH* 12, no. 49 (3 Sept. 1914), 1; almost every week for the first 1-2 months of the war, the magazine carried announcements about feeding soldiers’ families under the heading “Dresdner Frauen-Rundschau: Die Frau und der Krieg” on the verso side of the front cover.

⁶⁶³ Krüger to Pfarrer Fischer, 29 Aug. 1914, docs. 8-9, Nr. 8 Brot- und Speisemarken, 2.3.26 Kriegsunterstützungsamt, Stadtarchiv Dresden.

⁶⁶⁴ Ausschuss für Volksküchen Beschluss vom 12. Oktober 1914, doc. 28-29, Nr. 8 Brot- und Speisemarken, 2.3.26 Kriegsunterstützungsamt, Stadtarchiv Dresden.

⁶⁶⁵ Dr. Matthes to the Königliche Ministerium des Innern, 11 May 1916, doc. 1-2, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD; Dr. Matthes, “Die Abgrenzung des Besuherkreises,” in *Praktische Durchführung von Massenspeisung*, ed. Zentralstelle für Volkswohlfahrt, 55-65 (Berlin: Carl Heymann Verlag, 1916), 62-65; N. R. “Etwas von den Dresdner Küchenspeisungen,” *DH* 15, no. 38 (27 June 1917): 1; F.K. “Etwas von den Dresdner Volksküchen,” *DH* 16, no. 18 (3 Feb. 1918): 1; Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 149.

181 public kitchens.⁶⁶⁶

Collective feeding became a topic of national conversation in 1916 because the problem had become a systemic one of not enough food to buy in the shops, even if one did have enough money. Public debates and private conversations revolved around the question of how both domestic and shared kitchens could be managed more economically in order to make better use of scarce resources of food, fuel, and time. Of particular concern to (middle-class) observers was *Doppelversorgung*, the suspicion that some (working-class) people were “double dipping” by eating a big meal from the soup kitchens as a supplement to their weekly rations rather than as a replacement.⁶⁶⁷ Under the headline “One Nation—One Table,” one left-liberal newspaper called for meals containing meat to be deducted from clients’ food cards, because “each person may only be a guest at one table.”⁶⁶⁸ There was not enough food available in the publically managed supply for Germans to provision themselves well from it more than once per day (in a soup kitchen and with full rations purchased from shops); shrewd observers extended their critiques to the black market and to unrationed goods (like poultry and game), which allowed wealthier Germans to eat better in the privacy of their homes, out of sight and without the scrutiny of their fellow hungry citizens.

One way to solve this problem would have been to collectivize both cooking and eating. In fact, leading socialist August Bebel (1840-1913) had long enthused about the philosophy of scientific management and about the potential for modern technologies like electric potato-peelers and dishwashers to supersede (“emancipate”) single housewives with traditional tools

⁶⁶⁶ That was 69% of their capacity and represents 23% of the city’s population. Dienemann, “Hygienische Kriegsmaßnahmen,” 411.

⁶⁶⁷ E.g. pages 10-13, Niederschrift über die 20. Sitzung des Ernährungsbeirats vom 22. März 1917, doc. 152-160, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD.

⁶⁶⁸ “Ein Volk—ein Tisch,” *Berliner Börsen-Courier* Morgen-Ausgabe (6 June 1916), doc. 17, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD. Others shared this sentiment, such as Frau Goldstein of Darmstadt: “Denn es kann und darf in dieser Zeit niemand Gast an zwei Tischen sein.” In *Praktische Durchführung von Massenspeisungen*, 112.

and little knowledge of home economics. Well before the war and the hunger blockade, mass kitchens were part of his vision for a modern Germany.⁶⁶⁹ Even the article at start of this chapter quoted the *Magdeburger Volksstimme* approvingly on the desirability of “kitchens for everyone” replacing “the uneconomic small kitchen.”⁶⁷⁰ Socialists were interested in substituting efficient systems for inefficient individuals.

To the dismay of conservatives and centrists like August Skalweit, the most radical authors, like Richard Calwer (1868-1927) and Elisabeth Engelhardt, embraced both the economics and the patriotism of the new collective feeding movement—and then went to the rhetorical extreme of demanding mandatory, universal communal eating.⁶⁷¹ They argued that the government ought to seize all raw food products, process them, and provide them as finished meals through public kitchens.⁶⁷² This would put a stop to the black market, to spiraling prices, and to the ill-will engendered by wartime institutions that perpetuated social inequalities. While this critique of the existing system (or lack thereof) was theoretically sound, it was impractical, as it would have taken too much time and money to replace the kitchens in millions of domiciles with communal storage, cooking, and eating facilities. Lack of personal responsibility would encourage misuse of common resources, unlike the thriftiness of housewives who scrimped, saved, and did without in order to keep their households afloat. Not to mention that communal kitchens would reduce the ability of private citizens to supplement their meager and irregular

⁶⁶⁹ “Aus dem Vogtlande. Plauen. (Massenspeisung.)” *Sächsisches Volksblatt* (Zwickau) Nr. 133 (10 June 1916), doc. 19, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD; August Bebel, *Die Frau und der Sozialismus* (Zürich-Hottingen: Verlag der Volksbuchhandlung, 1879); *ibid.*, *Die Frau in der Vergangenheit, Gegenwart und Zukunft* (Zurich: J. Schabelitz, 1883).

⁶⁷⁰ “Massenspeisung,” *Leipziger Volkszeitung*.

⁶⁷¹ Krüger, “Die Massenspeisung,” 1-6; Elisabeth Engelhardt, *Die Zentralization der städtischen Haushaltungen: Das Problem der Massenspeisung der Städte*, 1. Aufl. (Munich: Summer 1916) and 2. Aufl. (Munich: “Glaube und Kunst” Parcus & Co., 1917), avail. as docs. 35 and 36, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁶⁷² The *Sächsische landwirtschaftliche Zeitschrift* kept up a running commentary on socialist pronouncements in the parliaments and papers; Calwer was a frequent opponent. See his *Das Wirtschaftsjahr Jahresberichte über den Wirtschafts- und Arbeitsmarkt Teil 2, Jahrbuch der Weltwirtschaft* (Jena: Fischer, 1903-1916).

official rations by “other means” (gardening, the black market, stealing, etc.).⁶⁷³ And not everyone would like or be able to eat the common meals.⁶⁷⁴

Less radical leftist voices sought incremental change. Some thought fair was equal: “When it comes to collective feeding, we owe it to our countrymen to adopt the same policy in all circumstances,” said one union organizer.⁶⁷⁵ Others wanted to redefine the inequalities of the food economy. The *Sächsisches Volksblatt* (Plauen) reported bitterly that “Mass feedings, previously decried as socialist, have now become a buzzword.... It would be better if the entire population, even the well-to-do, were included with the rest of us.”⁶⁷⁶ But they wouldn’t begrudge the wealthy the right to pay for an extra sausage in the communal dining hall. Meanwhile, the *Dresdner-Volkszeitung* demanded that no differences in the quality of meals served in public kitchens be allowed (i.e. between working- and middle-class kitchens)—but those who worked harder deserved larger portions, thereby repaying the calories they expended in the factories with calories to eat in the soup kitchens.⁶⁷⁷

Conservative commentators reversed the subject of criticism and introduced an overtly gendered argument when they suggested that the problem was not economics but education or work ethics: a significant number of women either did not possess or did not want to exercise housewifely skill in feeding their families. They argued that working-class housewives in

⁶⁷³ Krüger, “Die Massenspeisung,” 7-10; “Die Massenspeisung,” *Volksstimme* Nr. 218 (19 Sept. 1916), doc. 138, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

⁶⁷⁴ On Krankenküchen see the discussion in *Praktische Durchführung von Massenspeisung*. The general consensus seems to have been that the sick should be allowed to get meals from local hospitals if they wanted them. The Leipzig Insurance Company opened a “kitchen for the sick” in Nov. 1917 that was never as popular as anticipated, as the sick had to pay the full cost of the meal (1.50 M/40 cents reduced price) and turn in ration cards. Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 151.

⁶⁷⁵ “Bei der Massenspeisung müssen wir unter allen Umständen einheitlich vorgehen, das sind wir allen Volksgenossen schuldig.” Theodor Thomas, “Einrichtung und Rechnungsführung,” in *Praktische Durchführung von Massenspeisungen*, ed. Zentralstelle für Volkswohlfahrt, 11-22 (Berlin: Carl Heymann Verlag, 1916), 18.

⁶⁷⁶ “Aus dem Vogtlande. Plauen. (Massenspeisung.)” *Sächsisches Volksblatt* (Zwickau) Nr. 133 (10 June 1916), doc. 19, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

⁶⁷⁷ “Volksküchen für den Mittelstand?” *Dresdner-Volkszeitung* Nr. 252 (30 Oct. 1916), doc. 201, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

particular were too ignorant and/or wasteful and could not be trusted to shop and cook economically and healthfully in their individual kitchens. At the Berlin conference in July 1916, City Councilor Dr. Paul of Magdeburg voiced the common opinion that the communal kitchens should offer only one meal per day (excepting Sunday and sometimes Saturday):

Other meals must remain the responsibility of individual households. Here we are responding to the, in my opinion, widespread desire of the population, who would like to see the preservation of family life promoted as much as possible. ... Certainly there are many people who think differently and are gladly relieved of the trouble to care for themselves and their family. I do not believe that such attitudes should be supported. In a few cases this is also true of soldiers' wives, and I am convinced that the fathers out there in the field share my point of view and have a desire to find on their return capable housewives and not those who have forgotten how to keep the house in order. There is also no doubt that we would not have experienced such a lack in the national food supply in recent years, if all our women were as skilled in the home and in the kitchen as really should be the case.⁶⁷⁸

Dr. Paul was sure, no matter how dire the food situation, that Volksküchen amounted to neither charity for the deserving poor nor a necessary help in this time of need but to a crutch that allowed women to avoid cooking. In central Saxony, communities in the District of Chemnitz likewise resisted opening kitchens for two reasons: "1. Mass feeding will promote laziness and idleness. Once it has been introduced, it will not be let go in peacetime. 2. There is a lack of food resources."⁶⁷⁹ The district officials wrote to the State Food Office agreeing that it might make workers and their wives lazy in the long term, but they thought it was more important to ensure

⁶⁷⁸ "Die übrigen Mahlzeiten müssen Sache der einzelnen Haushaltungen bleiben. Wir begegnen nach meiner Überzeugung hier weitverbreiteten Wünschen der Bevölkerung, die die Aufrechterhaltung des Familienlebens möglichst gefördert gesehen möchte. ... Gewiß gibt es auch viele Personen, die anders denken, und die sich gern die Mühe, für sich und die Familie zu sorgen, abnehmen lassen. Ich glaube nicht, daß eine solche Gesinnung unterstützt werden darf. Vereinzelt gilt dies auch von Kriegerfrauen, und ich bin der Überzeugung, daß die Familienväter draußen im Felde ganz meiner Ansicht sind und den Wunsch haben, bei ihrer Rückkehr tüchtige Hausfrauen vorzufinden und nicht solche, die es verlernt haben, den Haushalt in Ordnung zu halten. Es steht auch außer Zweifel, daß wir im letzten Jahre in der Volksernährung die Not nicht in dem Umfang kennen gelernt haben würden, wenn alle unsere Frauen so in ihrem Haushalt und in der Küche Bescheid wüßten, wie es eigentlich der Fall sein sollte." In *Praktische Durchführung von Massenspeisungen*, 82.

⁶⁷⁹ "1. Durch die Massenspeisungen werde die Faulheit und Bequemlichkeit gefördert. Wenn sie einmal eingeführt sei, werde man sie auch im Frieden nicht mehr los. 2. Es fehle an Naturalien." Amthauptmannschaft Chemnitz to the Königliche Ministerium des Innern, 27 July 1916, doc. 59-61, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

them a hot meal in the short term.

Others were more generous. At the Berlin conference, the wife of the mayor of the small Prussian city of Lennep (pop. 13,000) in the Ruhr area retorted that if well-trained women from comfortable families were having difficulty putting good and wholesome meals on the table, then it was surely even more difficult for women with little means, less knowledge, and likely constant worry about their menfolk at the front. “On Sunday, the housewife is given the chance to cook for her family herself,” said Mrs. Stosberg. “Our women will not become comfortable during this war; it is far too difficult and too serious and permeates too deeply into the whole life of the people.”⁶⁸⁰ Although she came to the defense of women of lesser means and emphasized the similarity of German women’s experiences across class, it would be incorrect to assume that critiques of the public kitchens divided along gender lines; in defense of personal responsibility and gender complementarity, some women were just as disparaging as Dr. Paul.⁶⁸¹

Whether working-class women would not or could not perform their “housewifely duties,” (mostly) middle-class women trained in home economics seized the opportunity to generalize their domestic skills for the feeding of the nation.⁶⁸² One of the most well-known in Saxony was Magdalene Pfeifer, a traveling home economics instructor for the Agricultural Improvement Council (*Landeskulturrat*). In addition to frequent contributions to the *Saxon Agricultural Journal* (*Sächsische landwirtschaftliche Zeitschrift*), she published a *Saxon War Cookbook for Rural Homes* (1915) and a public-kitchen guidebook (1916) that summarized eight months of hands-on experience in the rural community of Hörnitz bei Zittau (pop. 1,700).⁶⁸³ By

⁶⁸⁰ “Am Sonntag ist also die Möglichkeit für die Hausfrau gegeben, für ihre Familie selbst zu kochen. ... Bequem werden unsere Frauen in diesem Kriege nicht, dazu ist er viel zu schwer und viel zu ernst und dringt viel zu tief in das ganze Volksleben ein.” In *Praktische Durchführung von Massenspeisungen*, 104-105.

⁶⁸¹ E.g. Frau Peltzer-Stolberg of Stolberg in the Rheinland in *Praktische Durchführung von Massenspeisungen*, 97.

⁶⁸² “Hauswirtschaftlichen Unterricht während der Kriegszeit,” *DH* 13, no. 47 (20 Aug. 1915): [i].

⁶⁸³ Magdalene Pfeifer, *Sächsisches Kriegskochbuch für ländliche Verhältnisse* (Dresden: Landeskulturrat für das Königreich Sachsen, 1915); *ibid.*, *Die Volksküche: Winke für die Einrichtung, den Betrieb und das Kochen nebst*

way of introduction she explained,

It is immediately clear and needs no further explanation that the soup kitchen, with its mass operations so different from the individual household, is able to utilize the existing food [better] and evenly distribute it to the population in a prepared state, and that the experience and knowledge of a capable public kitchen manager (*Volksküchenleiterin*) enable her to make certain ingredients more palatable or more accessible to the people, who would otherwise reject them or have to do without them.⁶⁸⁴

Pfeifer argued that communities recouped the cost of paying a trained kitchen leader in the improved quantity and quality of the meals. An ally agreed: “The world of educated women offers an incredible resource for sacrificial war work, which is of the utmost importance for calming the masses and for persevering in this economic war.”⁶⁸⁵ Even as this debate villainized working-class women, it valorized careerist middle-class ones.⁶⁸⁶

A *Volksküche* run by a trained home economist might be able to cook better than the average housewife of little means, but could the communal dining room replace the family table as the site for the consumption of what had been cooked? Union organizer Theodor Thomas (1876-1955) of Frankfurt am Main thought so: “Not only what one eats but rather how and where plays a role” in the beneficial influence of a hot midday meal. A formal set up with white cloths and flowers on the tables, white curtains on the windows, and white aprons on the (female) volunteers would remove the stigma of charity and welcome the better-off. It would also edify the common people and teach them to care more about themselves and their

Kochvorschriften für 50 Gerichte ([Dresden]: [Landeskulturrat für das Königreich Sachsen], 1916).

⁶⁸⁴ “Es ist ohne weiteres klar und bedarf keiner näheren Darlegung, daß die Volksküche mit ihrem Massenbetriebe ganz anders wie der Einzelhaushalt in der Lage ist, die vorhandenen Nahrungsmittel auszunützen und gleichmäßig in zubereitetem Zustande auf die Bevölkerung zu verteilen, und daß die Erfahrungen und die Kenntnisse einer tüchtigen Volksküchenleiterin es vermögen, den Leuten Dinge in schmackhafter Form zugänglich zu machen, auf deren Verwendung sie sonst verzichten oder verzichten müßten.” Pfeifer, *Die Volksküche*, 5.

⁶⁸⁵ “Hier bietet sich der gebildeten Frauenwelt ein ungemein weites Gebiet aufopfernder Kriegsarbeit dar, das für die Beruhigung der Massen und das Durchhalten im Wirtschaftskriege von größter Bedeutung ist.” Hans Krüger, “Die Massenspeisung,” 19.

⁶⁸⁶ A pattern repeated in the fields of medicine and social hygiene: Sabine Schleiermacher, “Die Frau als Hausärztin und Mutter. Das Frauenbild in der Gesundheitsaufklärung,” in *Hauptsache gesund! Gesundheitsaufklärung zwischen Disziplinierung und Emanzipation*, ed. Susanne Roeßiger and Heidrun Merk, 48-58 (Marburg: Jonas Verlag, 1998).

surroundings: Thomas shared that when his Volksküche had been located in the basement of a school, the guests had come to lunch directly from the factories, “unwashed and uncombed.” When the kitchen moved to a nicer gymnasium, “The behavior of the people immediately changed ... the tone was more refined.”⁶⁸⁷ Communal eating could educate the lower classes in good manners and taste that they allegedly were not learning at home.

Most observers accepted communal cooking but drew the line at communal eating. A minority objected for physiological and the psychological reasons: individuals were too different to be able to eat the same food. “Human beings are not so homogenous in their nature or their tastes,” wrote the *Volksstimme* in September 1916, “for the same food to appeal to everyone, and an individual would have to be in truly dire straits before he gave up living independently, even in straightened circumstances.”⁶⁸⁸ Volksküchen were enough of an imposition on family life and the private economy; the least they could do was encourage clients to take the food home, where it could be seasoned to taste and eaten at the family table.⁶⁸⁹ This encouragement came in the form of a reduced price for take-out meals or in regulations forbidding eating in.⁶⁹⁰

The majority objected for moral and cultural reasons. Eating-in discouraged or outright

⁶⁸⁷ “Sofort wurde das Benehmen der Leute anders. Sie kamen mit sauberen Kleidern, gewaschen; auch der Ton wurde viel edler.” In “Einrichtung und Rechnungsführung,” 12; *ibid.*, *Die Massenspeisung in Wort und Bild. Ein Beitrag zur Entwicklung der Frankfurter Kriegsküchen* (Frankfurt a. M.: Zentral-Küchenkommission, 1916).

⁶⁸⁸ “Die Menschen sind weder in ihrer Natur noch ihrem Geschmack so gleichartig, daß jedem dasselbe Essen zusagte und das Wasser muß schon bis zum Halse stehen, ehe der einzelne darauf verzichtet auch unter beschränkten Verhältnissen individuell zu leben.” “Die Massenspeisung,” *Volksstimme* [Chemnitz?] Nr. 218 (19 Sept. 1916), doc. 138, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

⁶⁸⁹ Stadtrat Doflein, p. 16 in Niederschrift über die Sitzung des [KEA] Ausschusses für Massenspeisung am 9. Dezember 1916 [in Berlin], doc. 48-56, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁶⁹⁰ In the Prussian city of Lüneberg, each portion was five cents cheaper if it was not eaten on the premises. Krüger, “Massenspeisung,” 16. When the District of Chemnitz opened 6 new kitchens for industrial workers, all 10,000 portions per week were required to be picked up and eaten elsewhere. Amtshauptmannschaft Chemnitz to the Königliche Ministerium des Innern, 27 July 1916, doc. 59-61, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD. In early 1917, Hans Krüger shared that of 357 communities reporting back to the KEA, 22 required clients to eat in, 83 required clients to carry out, and 252 had the option of eating in. However, he does not specify whether those communities offered soup kitchens, company cafeterias, or a combination. “Die Massenspeisung,” 35. That being said, the actual proportions of meals eaten in/carried out need not conform with the hyper-sensitive rhetoric about the desirability of the midday meal being consumed at home with the family.

prevented women from performing their housewifely and motherly duties.⁶⁹¹ Potatoes might be the backbone of collective feeding operations, but the family was the backbone of the nation. As gastroenterologist and dietician Dr. Karl Bornstein (1863-1942) noted with approval in a Leipzig newspaper, although many of the Volksküchen there had dining rooms for immediate consumption of the midday meal, “quite a lot can be sold for carry out, so that the family table in one’s own home, with all its simplicity, does not lose its beneficial and uplifting place in the life of the family.”⁶⁹² The “family table”—decorated with flowers or simple and homey—was considered a critical location of personal identity and daily life across social groups in Germany.

Finally, classism and misogyny pervaded debates about collective feeding. Restaurants were rarely regulated as strictly as soup kitchens, and the poor were bitter about proposals to deduct meals eaten in open kitchens from an individual’s weekly rations but not meals eaten in restaurants.⁶⁹³ “I must add that it seems unreasonable to account for things strictly in collective feeding that are used without oversight in restaurants, as is the case in many places with butter, fat, pasta and the like, often also with eggs, pearl barley, etc.,” explained Hans Krüger later.⁶⁹⁴ There was a double standard of expectations: few on-lookers complained about bachelors who ate most or all of their meals in restaurants; but if a working-class woman or family wanted to pay someone else to cook it was an outrage, and not just because the meals were often subsidized

⁶⁹¹ These “duties” could be considered the kind of in/tangible household goods (Z-commodities) Jan de Vries argues were valued in breadwinner-households between 1850 and 1950: “The Industrial Revolution and the Industrious Revolution,” *Journal of Economic History* 54, no. 2 (June 1994): 249-270; *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present* (New York: Cambridge University Press, 2008), 189.

⁶⁹² “Der Betrieb sei in den meisten Fällen so eingerichtet, daß Speiseräume zur sofortigen Einnahme der Mahlzeiten vorhanden sind, daß aber auch besonders reichlich über die Straße verkauft werden könne, damit der Familientisch im eigenen Heime seinen wohltuenden und bei aller Einfachheit beglückenden Platz im Leben der Familie nicht einbüße.” Dr. med. Bornstein, “Die praktische Durchführung von Massenspeisungen,” *Leipziger Neueste-Nachrichten* Nr. 189 (10 July 1916), doc. 49, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

⁶⁹³ Niederschrift über die 22. Sitzung des Ernährungbeirates vom 26. April 1917, doc.182-129, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 MdI, SHAD.

⁶⁹⁴ “Hierzu kommt, daß es unbillig erscheint, in der Massenspeisung Dinge scharf anzurechnen, die in den Gasthäusern ohne Anrechnung verwendet werden, wie es bei Butterfett, Teigwaren u. dergl., oft auch noch bei Eiern, Graupen usw., vielerorts der Fall ist.” “Die Massenspeisung,” 28.

and the ingredients taken from the public food supply before entering the stores for everyone else to purchase. It just was not *right* for women not to cook.⁶⁹⁵

In short, (working-class) women could not win. On the one hand, Volksküchen supporters argued that properly run large kitchens would be able to produce better dishes with less waste than the average housewife in her small kitchen could. Some supporters were holding onto older traditions of bourgeois philanthropy by well-to-do and well-intentioned women. Middle- and upper-class reformers had sought to improve the health and domesticity of their inferiors throughout the Imperial Period (1871-1918).⁶⁹⁶ Others were campaigning for a new generation who had found a way to make a career out of the same work other women did for free in their own families and that employed but untrained female cooks performed “unscientifically.” In either case, both the volunteers and the domestic science experts claimed to perform their proper roles as women and mothers to the nation.

On the other hand, Volksküchen critics complained that picking up meals—but especially the practice of eating-in—relieved women of their housewifely and motherly responsibilities, would make them lazy, and would cause them to forget how to keep house. That is to say, soup kitchens would deprive (working-class) women of the opportunity and ability to do a duty that supposedly they were not performing well in the first place. Women should volunteer their time and labor to serve in these public kitchens, but they should not eat there if they could perform that labor at home in their private kitchens. Poor housewives (in both senses) were the scapegoats for German leaders’ lack of foresight and a failed planned economy, and the debates over Volksküchen effectively cast them in the role of the nation’s petulant and dependent children.

⁶⁹⁵ Inga Wiedemann, *Herrin im Hause. Durch Koch- und Haushaltsbücher zur bürgerlichen Hausfrau* (Pfaffenweiler: Centaurus, 1993).

⁶⁹⁶ Bettina Sierck, “Wegweiser zum häuslichen Glück für Mädchen,” in *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*, ed. Gisela Framke, 357-382 (Bielefeld: Regionalgeschichte, 1998).

The proletarianization of the midday meal

As Baroness Horn of Munich declared at the Berlin conference in 1916,

Just as we Germans are a federally predisposed people in political matters, so we obviously also have federally predisposed taste buds, unlike the French, British, and Italians, whose cooking habits are much more uniform. The composition of a Hamburger's favorite dish can make us southern Germans shudder. In relation to diet, our *Volk* is united in only one respect.... In all stomach issues, it is conservative to the bone, even if its representatives take care to sit to the farthest left in parliament.⁶⁹⁷

So if not Rumford soup, then what did the “war kitchens” offer? Because of the need to serve hundreds if not thousands of portions, the weekly menus mostly contained soups and one-pot meals (*Eintopfgerichte*; see Table 4.5). This was already the practice in children's kitchens and in northern German cities like Hamburg, but to southern and western Germans a proper midday meal consisted of separate courses of soup, meat, and vegetable. The establishments in Frankfurt am Main and the middle-class kitchens that appeared later in the war often served the components separately, but elsewhere dishes consisted of potatoes (or turnips) and vegetables; sometimes pasta or rice provided the carbohydrates; and the protein was often beans, occasionally fish, and sometimes meat (1-3 times per week, depending on the local supply). This simple, plant-based diet—which dietary reformers praised as “traditionally German” and which some doctors credited with reductions in the severity of obesity, gout, and diabetes—smacked of charity and/or sick food and accounted for some of the soup kitchens' lack of popularity.

Although the *Volksküchen* were perceived as a threat to the traditional family meal, there were in fact greater challenges to it: the black market (*der Schleichhandel*) and factory canteens.

The one complicated housewives' efforts to put food on the table, while the other reduced the

⁶⁹⁷ “Wie wir Deutsche in politischer Beziehung ein föderativ veranlagtes Volk sind, so haben wir augenscheinlich auch föderativ veranlagte Geschmacksnerven, im Gegensatz zu den Franzosen, den Engländern und Italienern, deren Kochweise viel einheitlicher gestaltet ist. Ein Hamburger Leibgericht kann durch seine Zusammensetzung z. B. bei uns Süddeutschen ein gelindes Gruseln erwecken. Nur in einer Hinsicht ist in bezug auf die Ernährung nach meiner Erfahrung unser ganzes Volk übereinstimmend in seinem Empfinden.... In allen Magenfragen ist es konservativ bis in die Knochen, auch wenn seine Vertreter auf der äußersten linken Seite dieses Hohen Hauses ihre Plätze einzunehmen pflegen.” In *Praktische Durchführung von Massenspeisungen*, 25-26.

ability of family members to sit down at the table together. During the middle years of the war (1915-1916), small-scale illegal food purchases enabled Germans who could afford it to eat better than the official rations would allow, but in last two years of the war (1917-1918), large-scale illegal transactions actually removed food from the public market and directed it toward communities whose officials had fewer scruples than others and toward factories that ran in-house meal programs for their employees. Whereas small-scale black market activity could potentially benefit entire families along most of the economic spectrum, the large-scale black market disproportionately benefited the “restive” working classes—specifically adult factory workers—at the expense of office workers and other Germans who relied on white-collar jobs.⁶⁹⁸

As the planned food economy grew, so did the number and variety of illegal activities within and alongside it, as revealed by the entertaining letters that musician and Australian expatriot (Caroline) Ethel Cooper (1871-1961) wrote once a week to her sister Emmie Bevan Carr (1875-1975) from Leipzig. Shopkeepers might set aside better or scarce goods for preferred customers at the regulated price, or they might be willing to sell extra or illegal goods (like cake) for a higher price in exchange for legitimate ration cards, counterfeit coupons, or none at all. On one occasion Cooper received half a pound of Danish margarine from her grocer’s wife,⁶⁹⁹ on another she was able to secure “a pound of real white flour,”⁷⁰⁰ and on a third an acquaintance helped her purchase several bottles of Scott’s Emulsion from her grandfather’s chemist’s shop.⁷⁰¹

“Any sense of fair dealing seems to have disappeared from the face of Central Europe

⁶⁹⁸ The mayor of Cologne found himself in the national news for such dealings: “Schwere Mißstände in einer kriegswirtschaftlichen Gesellschaft. Große Unterschleife und Schiebungen,” *Chemnitzer Voksstimme* Nr. 136 (15 Jan. 1918), doc. 281, Nr. 23197 Lebensmittelversorgung, 10736 MdI, SHAD; Skalweit, *Kriegsernährungswirtschaft*, 222-228; Feldman, *Army, Industry and Labor*; Roger Chickering, *The Great War and Urban Life in Germany, Freiburg, 1914-1918* (New York: Cambridge University Press, 2007), 240-249.

⁶⁹⁹ Cooper, Letter 39A, 23 April 1916 (Easter Sunday), *Behind the Lines*, 137.

⁷⁰⁰ Cooper, Letter 6D, 8 Sept. 1918, *Behind the Lines*, 275.

⁷⁰¹ Cooper, Letter 38C, 21 April 1918, *Behind the Lines*, 252. The Emulsion contained an edible fat.

altogether,” she wrote in September 1917.⁷⁰²

Particularly (in)famous was the practice of scrounging trips (*Hamsterfahrten*). At first, city dwellers turned their usual Sunday afternoon jaunts out to the countryside into opportunities to purchase desirable goods from farmers, usually for exorbitant prices and without ration cards. When the authorities realized this, they began searching train passengers. One English woman recounted later how she rolled out a pound of butter with the farmwife’s rolling pin so that she could conceal it under “an innocent piece of cardboard” in the bottom of her suitcase.⁷⁰³ Some took to stealing potatoes from the fields, chickens from the henhouses, or fruit from the trees. After one trip that netted her and a friend a quantity of apples and plums, Cooper reported her disappointment at letting a stray duck get through a fence and out of her reach.⁷⁰⁴ Unsurprisingly, these actions did not endear the workers in the cities to the farmers in the country and contributed to both the urban-rural divide and the atmosphere of civil war after 1918.⁷⁰⁵

In fact, despite Germans’ reputation for obedience and order, smuggling, bartering, hoarding, and stealing were the new normal by 1917. As Cooper put it, “where everything is forbidden, you simply have to break the laws if you want to go on living.”⁷⁰⁶ She had friends who individually or entrepreneurially purchased food in Poland for consumption in Germany: while away on business trips, Emil Jaeger sent his (English) wife Connie a parcel every week until June 1918, when shortages reached crisis level in the East⁷⁰⁷; and their mutual friend Frau

⁷⁰² Cooper, Letter 8/C, 23 Sept. 1917, *Behind the Lines*, 221. Contemporaries frequently compared the situations in Austria, Hungary, and Germany, and while they expected bribery and corruption in the former two it was shocking in the latter, to which Cooper replied, “My imagination fails to picture what can be more corrupt in Austria than here.” Letter 18C, 2 Dec. 1917, *Behind the Lines*, 233.

⁷⁰³ An Englishwoman, “The Turnip Year in Germany,” *The Nation* 124, no. 3222 (6 April 1927): 370-372.

⁷⁰⁴ Cooper, Letters 1D, 4 Aug. 1918, and 3B, 20 Aug. 1916, *Behind the Lines*, 270, 155.

⁷⁰⁵ See e.g. Nr. 1 *Tagebuch*, 12728 Personennachlass Walter Oskar Lohs, SHAD; Skalweit, *Kriegsernährungswirtschaft*, 218-220.

⁷⁰⁶ Cooper, Letter 1D, 4 Aug. 1918, *Behind the Lines*, 270. Emphasis in original.

⁷⁰⁷ The hampers usually contained ham, bacon, and other foods hard to find in Germany. Cooper, Letters 43B, 27 May 1917, and 45C, 9 June 1918, *Behind the Lines*, 198, 258.

Lewicke made enough money from selling her smuggled goods “at Berlin prices” to live on.⁷⁰⁸ Meanwhile, Connie bribed the coalman with two pounds of ham for 15 hundredweight of coal (3/4 ton),⁷⁰⁹ and Frau Peovner had enough food in her pantry to provide a feast of “ham, butter, eggs, sweets, good wines and cigarettes” when Prince Max von Baden (1867-1929) was named chancellor in October 1918.⁷¹⁰ Yet Connie was furious when she discovered that the porter’s wife had been taking potatoes from her cellar when the poor woman could find none to buy honestly.⁷¹¹

Not everyone took advantage of the black market. Cooper regularly wondered how the poor were able to survive, considering how little food made it to market and at rising prices; illegal goods were that much more out of their financial reach. As early as July 1915 Cooper predicted that “there is a great day of reckoning ahead for the German Government on the day when its people realizes to what it has committed itself.”⁷¹² For his part, the head of the Saxon Food Office, Dr. Walter Koch (1870-1947), felt that his family should adhere the official rations on principle. He later remembered the heartbreaking sight of his children (Manfred, 15, and Vera, 11) returning from school and searching fruitlessly for something to eat and how he argued with his wife over the rations she shared with them.⁷¹³ Koch was willing to watch his family hunger (he lost 15 kg or 33 lb himself), but those who could or would break the law did so in order to feed their nuclear families at the expense of the national family.

Of course, not all Germans lived and ate with a family. Unmarried individuals frequently relied on restaurants and boarding houses for their warm meals, both for the socializing and

⁷⁰⁸ Cooper, Letters 39B, 29 April 1917; 40B, 6 May 1917; and 41B, 13 May 1917, *Behind the Lines*, 194-197.

⁷⁰⁹ Cooper, Letters 18C, 2 Dec. 1917, and 19C, 9 Dec. 1917, *Behind the Lines*, 233.

⁷¹⁰ “Frau Peovner ... has hamstered in a way that deserves to become a local scandal.” Cooper, Letter 10D, 7 Oct. 1918, *Behind the Lines*, 279.

⁷¹¹ Cooper, Letter 46C, 16 June 1918, *Behind the Lines*, 260.

⁷¹² Cooper, Letter 50, 11 July 1915, *Behind the Lines*, 84-85.

⁷¹³ “Kohlrübenwinter. Erinnerungen von Walter Koch,” Deutsches Historisches Museum/Lebendiges virtuelles Museum Online, accessed 14 Oct. 2012, http://www.dhm.de/lemo/forum/kollektives_gedaechtnis/065/index.html.

because they often rented rooms or apartments without kitchens, so as to save money.⁷¹⁴ Some may not have known how to cook, but even if they did, they might not have been able to find food or fuel; and many workers did not enjoy a long enough lunch break to go home from work and prepare a midday meal. Volksküchen were especially set up to meet this need among the working class, but when Saxony and neighboring states considered introducing restaurant ration cards (*Speisemarken*), a loud outcry came from middle- and upper-class patrons of private eateries.⁷¹⁵ The logic behind this failed scheme was that restaurants could serve meals with foods that were not rationed, like poultry, fish, and game. Anyone who could afford to eat an expensive meal for lunch could then use their ration cards to purchase meat for other meals—“double-dipping” just like those who ate the meager meals served in public kitchens. As it was, Dresden already used a system of “restaurant cards” (*Gasthauskarten*) in exchange for potato and pasta coupons⁷¹⁶; and Leipzig had required guests at restaurants, Volksküchen, *and* factory kitchens to give up certain rations since November-December 1917.⁷¹⁷ The nail in the coffin came when city councils in Plauen and other cities pointed out the logistical hurdles of trying to shoehorn their unique local rations into a state-wide program.⁷¹⁸ Ministry officials also feared a drop in business and tourism if individual states rather than the Reich tried to enforce this kind of regulation.

When the Reich did address the precarious food situation, it heeded cries to reward with extra food those who contributed the most to the war effort. In early 1917, the War Food Office

⁷¹⁴ E.g. Cooper, Letter 21C, 23 Dec. 1917, *Behind the Lines*, 235; “Was wird nach dem 15. April? Sorgt für warmes Abendbrot!,” *Vorwärts* (4 April 1917), doc. 64, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁷¹⁵ Doc. 90b, “Die Aushungerung der Junggesellen,” *Frankfurter Zeitung* (12 Sept. 1917), Nr. 23202 Einführung von Speisemarken 1917, 10736 MdI, SHAD.

⁷¹⁶ Der Rat zu Dresden to the Landeslebensmittelamt, 5 March 1917, docs. 23-24, Nr. 23202 Speisemarken, 10736 MdI, SHAD.

⁷¹⁷ Rat der Stadt Leipzig to the Landeslebensmittelamt, 5 March 1917, docs. 17-22, Nr. 23202 Speisemarken, 10736 MdI, SHAD. Restaurants and public kitchens demanded potato coupons starting 1 Nov. 1916; in Dec. factory canteens required cards for semolina, barley, groats, oatmeal, legume, pasta, and dried vegetables.

⁷¹⁸ Stadtrat Plauen to the Landeslebensmittelamt, 2 June 1917, docs. 80-84, Nr. 23202 Speisemarken, 10736 MdI, SHAD.

turned its attention (and provisions) toward supplements and programs for certain kinds of workers. At a time when both housewives and public kitchens struggled to obtain food supplies—in part because of the extent of illegal behaviors—another form of collective feeding, factory canteens, promised regular hot meals to the “most deserving.”⁷¹⁹ The cafeterias were collective feeding operations run by private businesses and open only to their employees. They were funded and provisioned by a combination of worker fees, employer contributions, extra rations for hard and hardest working laborers (*Schwer- and Schwerstarbeiter*), donations of meat and money to the Hindenburg Program, and supplies purchased from government food offices and the black market.⁷²⁰ Not only did canteens reward intense physical exertion for the war effort with extra calories and better food, but they re-configured the place and participants of the all-important midday meal from the middle-class ideal toward the working-class reality.⁷²¹

First it is important to note that few German households consisted of members whose diets were as autonomous as individual ration coupons might suggest. With an important exception discussed again below, family members generally had a similar diet and shared foods that did not lend themselves to purchase in individual portions (a loaf of bread, a cut of meat, a head of cabbage).⁷²² In fact, singletons like Ethel Cooper and her friends sometimes pooled their resources and rotated cooking responsibilities as a sort of mobile household.⁷²³ That individual

⁷¹⁹ Belinda J. Davis, *Home Fires Burning: Food, Politics, and Everyday Life in World War I Berlin* (Chapel Hill: University of North Carolina Press, 2000), 152-158, 169-179.

⁷²⁰ Skalweit, *Kriegsernährungswirtschaft*; Feldman, *Army, Industry and Labor*.

⁷²¹ Ulrike Thoms, “Essen in der Arbeitswelt. Das betriebliche Kantinenwesen seit seiner Entstehung um 1850,” in *Die Revolution am Esstisch. Neue Studien zur Nahrungskultur im 19./20. Jahrhundert*, ed. Hans-Jürgen Teuteberg, 203-218 (Stuttgart: Franz Steiner, 2004); Richard Biernacki, *The Fabrication of Labor in Germany and Britain, 1640-1914* (Berkeley: University of California Press, 1995), 380-383. Whereas in Great Britain, workplace eateries developed because workers’ wives increasingly worked out of the house and could not bring or prepare a midday meal, in Germany distances to factories increased to the point at which going home for lunch became impracticable.

⁷²² This tension between the family unit buying and preparing the food and the individual unit eating the food is why Lange’s suggestions for a family ration card was not adopted. Pages 1-4, Protokoll über die erste Sitzung des Ernährungsbeirats vom 13. April 1916, doc. 12-17, Nr. 23189 Protokolle über Ernährungsbeirats-Sitzungen Bd. 1, 10736 MdI, SHAD.

⁷²³ Letter 20B, 17 Dec. 1916, *Behind the Lines*, 172; at one point she had an agreement with the American Vice-

rations—especially supplements for at-risk groups—nevertheless came to the good of others was known and (mostly) accepted. Parents and older children benefitted from the relatively generous rations for infants and toddlers (Tables 4.1-4.3), fathers sometimes ate part of their wives' or children's weekly allocations, and mothers like Frau Koch frequently sacrificed for their children. When Dr. Franz Dienemann noted in his study of five Dresden households that the women were losing weight because “they do without for the benefit of the men and children,” he confirmed what everyone already knew: that women were often willing to sacrifice their health and comfort for loved ones.⁷²⁴ Their thinness, pallor, even amenorrhea (loss of menstruation) marked their care on their bodies. The redistribution of rations within families mirrored the movement of food resources among surplus and deficit districts and from the pool of general rations for the healthy to special rations for the sick.

The exception to the assumption that family members had similar diets was that laborers may not have eaten together with their families to begin with. Although working-class families strove for the middle-class ideal of everyone sitting down in the same place at the same time to enjoy the same meal, when this was unattainable they had long used a sort of “internal rationing” based on age, sex, and work status that granted more and more valuable foods (meat, fat) to the youth and adults who performed work outside the house.⁷²⁵ (Child-bearing and -rearing were not so privileged.) Although rarely articulated as such, this unofficial system replicated the status of meat in German society and rewarded overt physical labor, just as the calorie paradigm did. Thus, the re-organization of official government rations to grant extra foodstuffs to certain groups based on their work status in effect proletarianized German

Consuls in Leipzig: she cooked their rations for them and they all ate together. Letter 24B, 14 Jan. 1917, p. 176.

⁷²⁴ Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 1. Aufl. (Jena: Gustav Fischer, 1918), 75.

⁷²⁵ Christina Benninghaus, *Die anderen Jugendlichen: Arbeitermädchen in der Weimarer Republik* (Frankfurt am Main: Campus, 1999), 98-102; Ellen Ross, ““There Is Meat Ye Know Not Of”: Feeding a Family,” in *Love and Toil: Motherhood in Outcast London, 1870-1918* (New York: Oxford University Press, 1993), 27-55.

foodways. First, significant portions of the country’s edible resources were being distributed based on a common working-class practice; second, blue-collar workers disproportionately benefitted from the new official government policies. Until the shift toward canteens, their families had enjoyed their higher rations, too.

Confidence Shaft Canteen, Ore Mountain Joint-Stock Coal Company, Schedewitz, Saxony⁷²⁶

| <u>Week of November 27, 1916</u> | | <u>Week of December 4, 1916</u> | |
|----------------------------------|--------------------------|---------------------------------|---|
| Monday | White cabbage with pork | Monday | Mashed potatoes with bacon |
| Tuesday | Noodles with beef | Tuesday | Turnips with pork |
| Wednesday | Sour beans with bacons | Wednesday | White cabbage with bacon |
| Thursday | Potatoes with beef | Thursday | Bavarian meat and vegetable stew [<i>Pichelsteiner</i>] |
| Friday | Pearl barley with beef | Friday | White cabbage with pork |
| Saturday | White cabbage with bacon | Saturday | Pearl barley with beef |

The fact that food was shared at family tables in all classes is precisely why company cafeterias were made “eat in.”⁷²⁷ To ensure that supplementary rations for factory workers benefitted only the “deserving” individuals who labored for them and not the “undeserving” members of their households, this food (increasingly purchased illegally) was prepared and served for a sit-down midday meal at the place of employment. These laborers could not have a family dinner. Instead, they became members of a different family—the company family—that worked and ate together.⁷²⁸ Although they were not eating at home with their families, dining in the factory was more private than eating in a public hall. Now husbands, fathers, and other employed family members could eat what “everyone” agreed was their due out of the sight of hungry wives and children. And far from Rumford soup, the dishes they were served were

⁷²⁶ “Werksküche Vertrauen-Schacht. Normal-Küchenzettel auf 14 Tage. Giltig [sic] ab 27. November 1916,” doc. 44, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD. I do not know how many workers ate at this factory canteen. At the same time, about 260 persons were getting a warm midday meal from the public kitchen in Schedewitz, population almost 6,000. Amtshauptmannschaft Zwickau to the Landeslebensmittelamt, 2 Sept. 1916, doc. 156, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

⁷²⁷ Davis, *Home Fires Burning*, 152-189.

⁷²⁸ Jakob Tanner, *Fabrikmahlzeit: Ernährungswissenschaft, Industriearbeit und Volksernährung in der Schweiz 1890-1950* (Zürich: Chronos, 1999).

proper, “German” ones with meat (that is, pork or beef) every day, regardless of the poorest workers’ usually meatless diet or the official new meatless days or weeks other civilians had to observe.⁷²⁹ (See also Tables 4.4 and 4.5.)

Hard(est)-worker supplements and factory canteens leveled not just the class divide but also, paradoxically, the gender divide. Under the utilitarian values of the late- and post-war period, the nation’s ultimate bread-winners were expected to consume that bread themselves, thereby defeating the gendered and generational structure of the bread-winner ideal as provider for home-bound dependents. Moreover, because the menfolk no longer brought home the bacon for the womenfolk to cook, company cafeterias deprived working-class women of their kitchen duties, just as public kitchens did. Finally, hard- and hardest-worker supplements and factory canteens granted the benefits of nourishment and status to all laborers in war-important industries, including single men and women living alone or with families.

Conclusion

Around 1800, William Wordsworth and Count Rumford quarreled over the latter’s dehumanizing reduction of the poor to so many variables in a calculation on the transfer of heat, and over the threat soup kitchens posed to domestic life and harmony.⁷³⁰ A century later, similar themes surfaced in debates concerning food rations and wartime public kitchens in Germany. Conservatives wanted the masses to eat in Volksküchen as a way to economize on the level of the community—leaving enough food in the stores for those who would not or should not have to eat in the public kitchens—while Social Democrats wanted everyone to eat in the kitchens, “because a truly equal distribution would only be guaranteed if the whole people [*Volk*] was fed

⁷²⁹ Skalweit, *Kriegsernährungswirtschaft*, 26-49; Davis, *Home Fires Burning*, 169-175; Chickering, *The Great War and Urban Life*, 268.

⁷³⁰ Samantha Webb, “Wordsworth, Count Rumford, and Poverty Relief,” *Wordsworth Circle* 43, no. 1 (Winter 2012): 29-35.

from one pot.”⁷³¹ The economic need of many urban Germans was great enough drive them to the Volksküchen, albeit begrudgingly, due to the deep-seated preference across the political spectrum for the idea of the whole family sitting together around the table for dinner. Ironically, when the government agreed to feed “the most important” workers at their places of employment in war-related industries, it contributed to a proletarianization of German foodways.

If wartime Germany served as a national laboratory for replacing the family table with collective feeding, one would have to describe the experiment as a mixed success. Use of the public kitchens fluctuated throughout the war: although more Germans than ever before ate meals prepared in public kitchens, their numbers rarely amounted to more than 10% of a city’s population or 60% of the kitchens’ serving capacity.⁷³² After the early enthusiasm (and unemployment) subsided in late 1914, so did attendance. It slowly picked up again over 1915 but dropped temporarily whenever organizers began deducting meals from guests’ regular rations.⁷³³ The surge in participation in collective feeding in the middle of 1916 stimulated the discussions detailed above, was sustained by the involvement of the recently created War Food Office in Berlin, and took on increased significance with the failure of the potato crop in the “Turnip Winter” of 1916-1917. By October 1916 there were 1,457 kitchens in 357 communities around Germany, including 735 “soup kitchens for everyone,” 72 middle-class kitchens, 170 for children and the sick, and 125 factory kitchens (8% of the total).⁷³⁴ By February 1917, there were 2,207 mass feeding operations in 472 German communities with populations of at least ten

⁷³¹ Skalweit, *Kriegsernährungswirtschaft*, 43-44.

⁷³² The 60% capacity figure is particularly true of the large “kitchens for everyone”; the smaller middle-class kitchens tended to operate at about 80% of their capacity. “Capacity” meant the number of meals that could have been prepared if demand increased; unused capacity did not reflect prepared meals that went uneaten. Gustav Tenius, “Zur Statistik der Massenspeisungs-Einrichtungen,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 32-57 (Berlin: Reimar Hobbing, mid May 1917), 48-50.

⁷³³ Matthes to Kriegsorganisation Dresdner Vereine, 29 Nov. 1916, doc. 47, Nr. 8 Brot- und Speisemarken, 2.3.26 Kriegsunterstützungsamt, Stadtarchiv Dresden; *Praktische Durchführung von Massenspeisungen*, 83, 96-97, 104.

⁷³⁴ Tenius, “Zur Statistik der Massenspeisungs-Einrichtungen,” 33-34; Skalweit, *Kriegsernährungswirtschaft*, 42-43.

thousand; 528 (24%) of these were factory canteens.⁷³⁵ Although some kitchens for the unemployed closed as the war created more jobs, others closed for lack of supplies, and many schools and cafeterias were shuttered in 1917 and 1918 to conserve fuel during the winter,⁷³⁶ major cities found themselves serving tens of thousands of hungry souls every day: 16,000 in Chemnitz, 38,000 in Leipzig, 65,600 in Dresden in October 1918. (Tables 4.6-4.9.)

Despite this evident need—which was greater in 1918 and 1919 than during most of the war—observers frequently commented that the people disliked having to rely on the public kitchens. It is true that participation numbers for Volksküchen never amounted to a majority of the German population. But then, the entire 67 million was not eligible. Around 22 million self-supporting food producers (*Selbstversorger*) did not receive the ration coupons they would have needed to exchange for meal tickets; others lived in sparsely populated areas that did not offer kitchens.⁷³⁷ Meanwhile, 11 million fathers, husbands, and sons went to the front, where they ate together in what proponents of communal dining glowingly described as demonstrations of brotherhood.⁷³⁸ Considering the tiny number who used the charitable kitchens before the war, the average of 6-7% participation of urban populations is truly impressive.⁷³⁹ By the end of the war, Dresden had seen a 40-fold increase in the number of portions served in public kitchens, from 1,300 per day in 1913 to 55-65,000 per day in late 1918.⁷⁴⁰ Because of the precarious food

⁷³⁵ Tenius, “Zur Statistik der Massenspeisungs-Einrichtungen,” 40.

⁷³⁶ Cooper, Letter 27B, 4 Feb. 1917, *Behind the Lines*, 181; Skalweit, *Kriegsernährungswirtschaft*, 48-50; Davis, *Home Fires Burning*, 173.

⁷³⁷ Skalweit describes the German population as one-third *Selbstversorger*. *Kriegsernährungswirtschaft*, 1. Scheu claims 10% of the Saxon population were *Selbstversorger*. “Lebensmittelversorgung der Sächsischen Städte,” 207. According to the 1917 census however, only 6-7% qualified (284,314 out of a population of 4,343,575). Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, *Hauptergebnisse der Volkszählung im Deutschen Reich am 5. Dezember 1917* (Berlin: Reichsdruckerei, 1918), 36-39.

⁷³⁸ “Die deutsche Kriegsküche,” *DH* 14, no. 26 (26 March 1916): 1-2.

⁷³⁹ In Jan.-Feb. 1917, 5-8%; Tenius, 49. In Oct. 1918, 6-7%; Skalweit, *Kriegsernährungswirtschaft*, 51; see also Davis, *Home Fires Burning*, 153, 155 for graphs of selected cities.

⁷⁴⁰ Dienemann, “Hygienische Maßnahmen,” 411; Skalweit, *Kriegsernährungswirtschaft*, 51.

situation, “large cities are inconceivable anymore without collective feeding institutions.”⁷⁴¹

Only in mid-1919 did attendance numbers begin dropping in many locales, with free-standing kitchens closing more quickly than canteens. Even though the former allowed the possibility of eating at home but the latter did not, the usual rationale given was that “families prefer to eat together at home, now that housewives have the possibility of provisioning their households” from a food market improving incrementally since the signing of the Versailles Treaty and the relaxation of the trade embargo.⁷⁴² Dresden’s public kitchens were still giving out 21,000 portions per day in October 1919, and both Leipzig and Chemnitz had experienced increases in the numbers served.⁷⁴³ The end came sooner than some had hoped: the last Volksküchen in Saxony closed between January and April 1920 due not to lack of demand but to shortage of coal.⁷⁴⁴ Food rationing was finally lifted between August 1920 (meat) and September 1922 (bread), although the hyperinflation did not reach its peak until November 1923.⁷⁴⁵

However impressive participation numbers in the public kitchens were, it cannot be said that these figures were attained due to the desire of the many to eat as one. More Germans stayed away than participated in Volksküchen, because even if there was one in their neighborhood, neither economic need nor patriotic ideology could persuade them to abandon the comfort and status of a midday meal at home if they could at all scrape one together. For those who could afford it, the tradition of the nuclear family around the domestic table was more convincing than

⁷⁴¹ “Die Großstädte sind daher ohne Massenspeisungseinrichtungen nicht mehr gut denkbar.” Johanna Emmel, *Die Massenspeisungen im Weltkrieg* (Apolda: Apoldaer Volkszeitung, 1919; diss., Julius-Maximilians-Univ., Würzburg), 49.

⁷⁴² Eine Hausfrau der Großstadt, “Gemeinschaftsküchen,” *DH* 19, no. 25 (20 March 1921): 2; Dr. Fritsche, Landeslebensmittelamt to the Arbeitsministerium, 4. Nov. 1919, doc. 131, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁷⁴³ Table 4.6; doc. 134-135, 5 Dec. 1919, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁷⁴⁴ Docs. 120-157, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

⁷⁴⁵ Gerald D. Feldman, “Bayern und Sachsen in der Hyperinflation 1922/23,” *Historische Zeitschrift* 238, no. 3 (June 1984): 569-609; Schlegel, *Die Lebensmittelversorgung der Stadt Leipzig*, 81-82, 129-131, 134. Discount bread and flour coupons for the poor continued until 15 April 1924.

either liberal or conservative fantasies of the national family gathered around a communal table. Meanwhile, those Germans who ate their midday meal out of the house—and especially in workplace-based cafeterias—participated in the scaling-up of the established working-class practice of “internal rationing” of scarce foodstuffs along utilitarian lines. While disrupting the midday family meal much more than the public kitchens had, the movement for cafeterias offered physiologically and psychologically satisfying meals, a new sociability centered around work, and an identity predicated on utility for the nation that finally allowed workers to be seen as valuable contributors to national strength. This remarkable achievement relied on illegal transactions on the black market that deprived other Germans of the ability to feed their families and lead to angry dissension between producers and customers, between competing consumers, and between citizens and the government.

That the German government was willing—or rather, felt it necessary—to guarantee the diet of its citizens on both the battle front and the home front was an entirely new idea. As Belinda Davis has argued, it created expectations that could not be fulfilled and that eventually brought down the empire.⁷⁴⁶ Neither “peace among the political parties” nor collective feeding operations had succeeded in uniting Germans into one national family that voted, fought, and ate together, and the Kaiser was perceived as having failed in his role as father-provider of the nation. Driven in part by lack of military victory and in part by the immiseration of the civilian population, soldiers, sailors, working-class women, and factory workers rebelled in October and November 1918. So little did Germans feel like a national family that activists on the left deposed their emperor and kings, from Wilhelm II in Berlin to Friedrich August III in Dresden.

As I suggested in the Introductory Essay to Part II, experiences of the hunger blockade differed over time, place, and social position. If this was so, how could World War I be so

⁷⁴⁶ Davis, *Home Fires Burning*.

important to Germans' collective life and identity? The details may have varied between Ebersbach and Berlin and between civil servants and munitions workers, but all civilians participated in an antagonistic system that allowed every side to feel victimized: the white-collar workers for the decreased purchasing power of their fixed incomes; the blue-collar workers for not getting the high wages and food supplements of workers in the armaments industry; munitions workers because they had adopted the rhetoric of the caloric economy and felt they worked much harder for the war effort than everyone else; working- and lower-middle-class women because they could not feed their families whether they stayed home or went out to work; middle-class women because there was less and less food to buy in the shops. Farmers either truly did not have enough food due to restrictions on those who raised their own food or to quasi-legal searches to enforce production quotas that failed to compensate for widespread lack of fertilizers, animals, laborers, working machinery, and seed; or, even if farmers did have enough food for their families, their domestic and field hands, and their animals, they were the objects of almost continuous abuse from food office bureaucrats, the press, and even the city folk knocking on their doors and begging to buy butter, potatoes, or milk illegally.

In other words, all Germans experienced collective anxiety about food, and most experienced hunger from the middle of the war until after the peace treaty was signed. Although planners of the food economy aspired to create a system in which each member of the national family or community received what was fair, what was actually achieved was a community of suffering. This is why from the 1920s through the 1940s, food and eating, hunger and digestion were so important in the telescopic perspective in general, and to the cultural and political metaphor of the *Volkskörper* in particular. Eating at the family table was a heavily invested social, cultural, and political trope in public discussions about food, which is why I chose it as

the representative layer of the telescopic body between the eating individual and the social body.

However much actual German families diverged from the bourgeois paradigm, “the family” remained an important layer of belonging in the telescopic body.⁷⁴⁷ Whatever school, work, or social activities individual Germans did outside the home, ideally they returned to it to eat proper meals around the family table. The table connected individuals to each other and the individual citizen to the nation-state: it was where wives and mothers were supposed to implement the new, government-sanctioned science of nutrition through their shopping, cooking, and serving habits, and where fathers and children consumed both food and knowledge. The hardships of World War I and the postwar period inculcated this telescopic perspective more effectively than any previous hygiene propaganda.

⁷⁴⁷ Michelle Mouton, *From Nurturing the Nation to Purifying the Volk: Weimar and Nazi Family Policy, 1918-1945* (New York: German Historical Institute & Cambridge University Press, 2007); Elizabeth Harvey, *Women and the Nazi East: Agents and Witnesses of Germanization* (New Haven, CT: Yale University Press, 2003); Lisa Pine, *Nazi Family Policy, 1933-1945* (Oxford: Berg, 1997); Claudia Koonz, *Mothers in the Fatherland: Women, the Family and Nazi Politics* (New York: St. Martin's Press, 1987).

Chapter 4 – Illustration



“A Good Housefather.” “Hey, Mr. Huber, now with the meat cards, you’ll have t’ tight’n yer big ol’ belt a little.” — “How so? M’ wife doesn’t eat meat, th’ children don’t get any, th’ maid doesn’t need any—it’ll be enough for me!”⁷⁴⁸

⁷⁴⁸ Rudolf Grieb, “Ein guter Hausvater,” *Simplicissimus* 21, no. 9 (30 May 1916): 30. An Imperial Meat Office (*Reichsfleischstelle*) had been organized on 27 March 1916.

Chapter 4 – Tables

Table 4.1. Required versus Rationed Calories in Leipzig and Dresden

Leipzig

| Age: | 1-3 months | 4-12 months | 1-2 years | 3-6 years | ≥ 7 years |
|-----------------|-------------------|--------------------|------------------|------------------|------------------|
| Rationed | 680 kcal/ day | 1,060 | 1,700 | 2,600 | 1,440 |

| Supplements | 13-18 years old | 7-9th month of pregnancy | ≤ 6 weeks after giving birth | breastfeeding women | “hard workers” | “hardest workers” |
|--------------------|-----------------|--------------------------|------------------------------|---------------------|----------------|-------------------|
| Rationed | 1,600 kcal/ day | 2,000 | 1,740 | 2,150 | 1,750 | 2,060 |

Dresden

| Age: | 1 year old | 2 years | 3-4 years | 5-6 years | 7-8 years | 8-10 years | 11-12 years | 15-65 years |
|------------------------------|-------------------|----------------|------------------|------------------|------------------|-------------------|--------------------|--------------------|
| Rationed | 1,595 | 1,936 | 1,674 | 1,609 | 1,630 | 1,436 | 1,436 | 1,436 |
| Requiredⁱ | 900 | 1,200 | 1,300 | 1,600 | 1,800 | 2,000 | 2,200 | 2,500 |
| Requiredⁱⁱ | 900 | 1, 100 | 1, 200 | 1, 400 | 1, 700 | 1,800 | 2,200 | 2,500 |

| | women 15-65 | 65-70 years | > 70 years | 7-9th month of pregnancy | ≤ 6 weeks after giving birth | breastfeeding women | “hard workers” | armaments workers | “hardest workers” |
|------------------------------|-------------|-----------------------|-----------------------|--------------------------|------------------------------|---------------------|----------------|-------------------|-------------------|
| Rationed | 1,924 | 1,467 | 1,630 | 2,050 | 1,562 | 2,212 | 1,594 | 1,723 | 1,959 |
| Required^{ix} | 2-2,400 | 2,200 ^{viii} | 1,900 ^{viii} | 2,500 | 1,275 ⁱⁱⁱ | 2,500 | 3,500 | 4,200 | 6,000 |

ⁱ Franz Dienemann, “Ueber die Ernährung der Kranken im Kriege und ihre Grundlagen,” *DmW* 43:1, no. 13 (29 March 1917): 394-397, here 395.

ⁱⁱ Franz Dienemann, “Für die Jugendlichen!” *Soziale Praxis und Archiv für Volkswohlfahrt* 26, no. 52 (27 Sept. 1917): 997-1000, here 999.

ⁱⁱⁱ Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 1. Aufl. (Jena: Gustav Fischer, 1918), 64-65. While on bedrest.

Table 4.2. Weekly Rations in Leipzig (March 1918)^{iv}

| Age: | 1-3 months | 4-12 months | 1-2 years | 3-6 years | ≥ 7 years | Denmark^v |
|--------------------------|--------------------|--------------------|----------------------|----------------------|----------------------|-----------------------------------|
| bread | -- | 500 g (wheat) | 1000 g (wheat) | 1,500 g (rye) | 2,000 g (rye) | 1,800 g (rye), 700 g (wheat) |
| flour | -- | 125 g (wheat) | 125 g (wheat) | -- | 25 g (rye) | 219 g (barley) |
| oats, etc. ^{vi} | 250 g | 250 g | 250 g | 150 g | 100 g | 175 g (beef), 175 g (pork) |
| potatoes | -- | -- | 3,500 g | 3,500 g | 3,500 g | 250 g |
| meat | 125 g | 125 g | 125 g | 125 g | 125 g | 2,100 g (whole) + 700 g (skim) |
| fat | 70 g | 70 g | 70 g | 70 g | 70 g | 140 g |
| milk | 7/2 L | 21/4 L | 21/4 L | 7/2 L | -- | “some” |
| quark or cheese | -- | -- | 62.5 g or 31.25 g | 62.5 g or 31.25 g | 62.5 g or 31.25 g | 467 g |
| eggs | ½ | ½ | ½ | ½ | ½ | -- |
| sugar | 250 g | 250 g | 250 g | 168 g | 168 g | |
| marmelade | -- | -- | -- | 210 g | 210 g | |
| Calories | 680 per day | 1,060 | 1,700 | 2,600 | 1,440 | 2,300 |

| Supple- ments | 13-18 years old | 7-9th month of pregnancy | ≤ 6 weeks after giving birth | breastfeeding women | “hard workers” | “hardest workers” |
|--------------------------|----------------------|-----------------------------|---------------------------------|------------------------|---------------------|--------------------|
| bread | 500 g | 350 g or 250 g | -- | 350 g or 250 g | 500 g | 1,500 g |
| flour | -- | | -- | | -- | |
| meat | -- | -- | -- | -- | 125 g | 125 g |
| fat | -- | -- | -- | -- | 50 g ^{vii} | 50 g ^{iv} |
| milk | -- | -- | 7/2 L | 7 L | -- | -- |
| Calories | 1,600 per day | 2,000 | 1,740 | 2,150 | 1,750 | 2,060 |

^{iv} Landesgesundheitsamt Sachsen, *Dritter Jahresbericht des Landes-Gesundheitsamtes über das Gesundheitswesen in Sachsen auf die Jahre 1914-1918* (Dresden: [Vogel], 1921), 146-147.

^v Also 700 g low-alcohol beer, 700 g fruits and vegetables, and 35 g coffee surrogate. Svend Skaftø Overgaard, “Mikkel Hindhede and the Science and Rhetoric of Food Rationing in Denmark, 1917-1918,” in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, 201-215 (Farnham, Eng.: Ashgate, 2011), 205.

^{vi} “Nährmittel” included oats, semolina, and sometimes barley or malt.

^{vii} Plus ¼ lb bacon per month from the Hindenburg Program.

Table 4.3. Weekly Rations in Dresden (May 1918)^{viii}

| Age: | 1 year old | 2 years | 3-4 years | 5-6 years | 7-8 years | ≥ 8 years |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| bread, flour, zwieback, or rolls | 500 g | 1,500 g | 1,500 g | 1,500 g | 2,000 g | 2,000 g |
| oats, etc. | 312.5 g (A) | 312.5 g (A) | 312.5 g (A) | 250 g (B) | 250 g (B) | 187.5 g (C) |
| potatoes | 2,500 g | 2,500 g | 2,500 g | 3,500 g | 3,500 g | 3,500 g |
| meat and sausage | -- | 100-125 g | 100-125 g | 100-125 g | 200-250 g | 200-250 g |
| butter or margarine | 62.5 g | 62.5 g | 62.5 g | 62.5 g | 62.5 g | 62.5 g |
| milk | 7 L ^{ix} | 7 L ^{vi} | 5 ¼ L | 3 ½ L | 1 ¾ L | -- |
| skim or buttermilk or quark or cheese | ¼ L or 125 g or 62.5 g | ¼ L or 125 g or 62.5 g | ¼ L or 125 g or 62.5 g | ¼ L or 125 g or 62.5 g | ¼ L or 125 g or 62.5 g | ¼ L or 125 g or 62.5 g |
| sugar | 350 g | 350 g | 175 g | 175 g | 175 g | 175 g |
| Calories per day | 1,595 | 1,936 | 1,674 | 1,609 | 1,630 | 1,436 |

| Supplements | 8-18 & 65-69 years | ≥ 70 years | 6th month of pregnancy | 7-9th month of pregnancy | ≤ 6 weeks after giving birth | breastfeeding women | “hard workers” | armaments workers | “hardest workers” |
|-------------------------------|--------------------|--------------|------------------------|--------------------------|------------------------------|---------------------|----------------|--------------------|----------------------|
| bread | -- | -- | | 400 g | 400 g | 400 g | 500 g | 500 g | 1,250 g |
| meat | -- | -- | | -- | -- | -- | -- | 125 g ^x | 125 g ^{vii} |
| milk | -- | 1 ¾ L | 5 ¼ L | 5 ¼ L | 5 ¼ L | 7 L | -- | -- | -- |
| oats, etc. | 62.5 g (B) | 62.5 g (D) | | -- | -- | -- | -- | -- | -- |
| Total calories per day | 1,467 | 1,630 | 1,924 | 2,050 | 1,562 | 2,212 | 1,594 | 1,723 | 1,959 |

^{viii} Franz Dienemann, “Hygienische Kriegsmaßnahmen deutscher Städte. 8. Dresden,” *Öffentliche Gesundheitspflege* 3, no. 12 ([Dec.] 1918): 401-419; here 408-409. Rearranged to better reflect the organization of the table for Leipzig in Appendix A. The letters in parentheses denote group ration cards for which the War Food Office of Dresden could set the weekly amount based on supply (A: yellow, B: red, C: green, D: blue).

^{ix} As long as the child was not being breastfed, in which case the milk went to the mother as a supplement. Children who received both breast and bottle were granted half as much: 3 ½ L of milk per week (325 calories per day).

^x 31g of bacon, presumably from the Hindenburg Program

Table 4.4. Sales and Serving Restrictions on Shops and Restaurants in Germany^{xi}

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---------------------------|-----------|------------------------------|---------------------------|--------------------|----------|
| No fat or dishes cooked w/it | No pork or beef (dishes)* | | No fat or dishes cooked w/it | No pork or beef (dishes)* | No flour; no pork* | No flour |
| Free rolls disappeared with bread rationing (25 Jan. 1915); cream forbidden (2 Sept. 1915); *except as cold-cuts on bread (28 Oct. 1915); no more than two meat dishes on the menu per day (31 May 1916); poultry, fish, and game did not count as “meat”; no schnapps served after 9pm and lights out at midnight. | | | | | | |

Table 4.5. Public Kitchen Menus and Prices in Dresden (First Week of October 1916)^{xii}

| <u>Public Kitchen</u> | <u>Central Kitchen</u> | <u>Factory Kitchen</u> |
|--------------------------------------|-------------------------------|----------------------------|
| Noodles with meat | Pearl barley | Noodles |
| Salted beans with potatoes | White cabbage with potatoes | White beans |
| White cabbage with potatoes | Turnips (<i>Steckrüben</i>) | Mushroom ragout |
| Pearl barley with meat | Meat and potatoes | Mixed vegetables |
| Salted beans with potatoes | Apples, beets and potatoes | Potato chunks with carrots |
| White cabbage with meat and potatoes | Potatoes with herring | |
| | Mixed vegetables | |

The public kitchen menu on the left was probably meant for soldiers’ families and the unemployed (cost: 10 cents and free, respectively). Their meals were cooked in school or charity kitchens and subsidized by the city, the state, and private donors.^{xiii} The menu in the middle would have been prepared in a large central kitchen and then carted to distribution centers for eat-in or (more likely) carry-out. A ¾-liter portion cost 35 cents in such “kitchens for everyone” (*Küchen für jedermann*), and hard workers (*Schwerarbeiter*) could get 1 ½ portions for 50 cents.^{xiv} The factory menu on the right was probably prepared in a Verein Volkswohl kitchen and then taken to factories for distribution; they charged 30 cents. Unlike the meals factory owners prepared for their workers, these dishes were always meatless. The Verein also delivered to working-class neighborhoods like the Leipziger Vorstadt and Löbtau-Cotta via “mobile kitchens.” In Dresden, meals from these *Gulaschkanonen* cost 35 cents on meat days and 25 cents on meatless days.^{xv}

^{xi} August Skalweit, *Die deutsche Kriegsernährungswirtschaft* (New Haven: Yale University Press, 1927), 35-49. See also Ethel Cooper, Letter 15A, 7 Nov. 1915; and Letter 18A, 30 Nov. 1915, *Behind the Lines: One Woman’s War 1914-18. The Letters of Caroline Ethel Cooper*, ed. Decie Denholm (London: Jill Norman & Hobhouse, 1982), 109, 113; Madeleine Zabriskie Doty, *Short Rations: An American Woman in Germany, 1915...1916* (New York: The Century Co., 1917), 101-102; “Für die Küche. Einfacher Küchenszettel,” *DH* 14, no. 9 (26 Nov. 1915), 28.

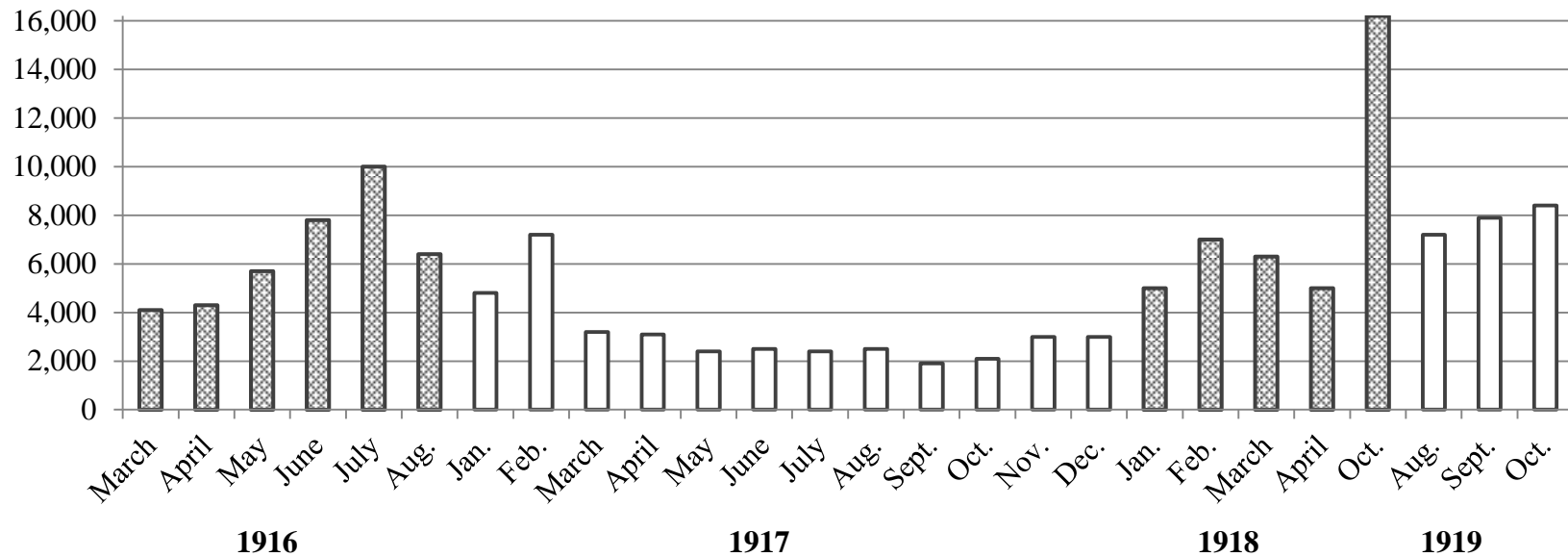
^{xii} Franz Dienemann, “Hygienische Kriegsmaßnahmen,” 412; repeated in Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 150.

^{xiii} Käthe Dornan, “Volksküchen in Dresden für die Familien der Kriegsteilnehmern,” *DH* 12, no. 625 (3 Sept. 1914): 1; C. F., “Was die ‘Kriegsorganisation Dresdner Vereine’ leistet,” *DH* 13, no. 15 (12 Jan. 1915): 1-2.

^{xiv} These meals originally cost 10 cents too, but on 10 April 1916, the price in the Volksküchen went up to 35 cents. Doc. 46, Nr. 8 Brot- und Speisemarken, 2.3.26 Kriegsunterstützungsamt, Stadtarchiv, Dresden.

^{xv} “Die öffentliche Speisengabe in Chemnitz,” *Allgemeine Zeitung* (11 June 1916), doc. 59-61, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD. On prices elsewhere in Germany, Hans Krüger, “Die Massenspeisung,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 1-31 (Berlin: Reimar Hobbing, mid May 1917), 24-25.

Table 4.6. Meals Served per Day in Public Kitchens in Chemnitz (1916-1919)^{xvi}



When the war began, the 8 cooking schools in Chemnitz devoted their kitchens to preparing meals for soldiers' wives. These required a meal ticket from the War Welfare Office (*Kriegsfürsorgeamt*) and could be picked up Monday-Wednesday and Friday-Saturday when school was in session (summer break began 15 July 1916). By the end of 1917 there were 10 such kitchens selling ¾-liter portions for 35/30 cents with/out meat.

Since before the war the city of Chemnitz had run one soup kitchen (*städtische Speisehaus*), open 7 days a week for everyone. Its 3,000 portions per day sufficed until April 1916, when the War Welfare Committee created a Public Kitchen Administration (*Volksküchenverwaltung*) to contract with existing restaurants and entertainment venues to prepare meals for up to 700 persons each.^{xvii}

^{xvi} Rat der Stadt Chemnitz to the Landeslebensmittelamt, 25 Aug. 1916, doc. 92-99, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD; Philipp Stein, "Der Besuch der Massenspeisungen und die Lage der Lebensmittelversorgung," *Beiträge zur kommunalen Kriegswirtschaft* 2, no. 30 (20 June 1918): 349-353; Skalweit, *Kriegsernährungswirtschaft*, 49,51; Landeslebensmittelamt, 5 Dec. 1919, doc. 134-135, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

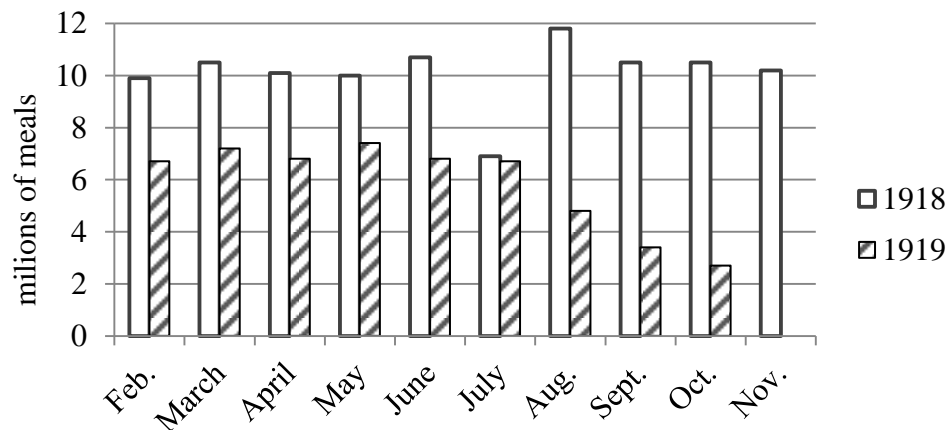
^{xvii} Service opened on 1 May 1916 at Gesellschaftshaus Thalia, Gasthaus Altchemnitz, Schankwirtschaft Tivoli, the Marmorpalast, Gasthaus Adler, Schankwirtschaft Erholung; on 29 May at Heller's Ballhaus; on 1 July at the Parkschänke; and on 17 July at Gasthaus Neugablenz. Rat der Stadt Chemnitz to the Landeslebensmittelamt, 93. There were 10 in Dec. 1917. Friedrich Döhling, *Das Problem der Massenspeisung und die Massenspeisungsbewegung in Deutschland, im Speziellen in München* (München: M. Steinebach, 1918), 63-64.

Table 4.6 (continued)

These “kitchens for everyone” served every day except Sunday and holidays like Easter Monday, so I have assumed 26 serving days per month. The city provided the food, a subsidy of 10 cents per portion (20 cents from July 1916), and a contribution toward overhead on a sliding scale based on portions sold.^{xviii} Meal tickets could be purchased up to one day in advanced at the Poor Office, the War Welfare Office, the Unemployment Bureau, and the kitchens themselves. Portions in both the Speisehaus and the 10 Volksküchen were $\frac{3}{4}$ liter and cost 30 with meat and 25 cents without. By late 1917 they were serving both lunch and dinner at the increased price of 45/40 cents with/out meat. Dishes with meat also required a 50-gram ration coupon and those with potatoes a 1-lb potato ration coupon. Customers were expected to pick up their meals to eat elsewhere, unless the owner of the eatery allowed them to eat-in for no extra charge.

Finally, in June 1917, two middle-class kitchens opened in Chemnitz. They served a steadily increasing number of midday and evening meals, from 1,860 portions in the first month to 5,325 in April 1918. According to contemporary observers like Stadtrat Professor Dr. Philipp Stein, the sudden interest in middle-class kitchens—and their increasing popularity—was unique compared to other German cities, such as Frankfurt am Main and Hamburg, where participation in public kitchens had been declining since the new harvest year began in late summer 1917.^{xix} (Chemnitz’s kitchens took a hit already in March 1917, when they began requiring general ration coupons in exchange for meal tickets.) However, even Stein’s numbers for Cologne, Hamburg, and Kiel show an upward trend in early 1918. It was a trend that culminated in astonishing numbers of meals served per day in October 1918, which Skalweit—even from the perspective of 1927—refuses to recognize, because he wanted to tell a narrative about Massenspeisung’s lack of success. Commentators who neglect the last months of the war and 1919 miss the continued contributions of Volksküchen to Germans’ daily diets (see below).

Table 4.7. Meals Served per Day in Public Kitchens in Germany (1918-1919)^{xx}



^{xviii} This contribution ranged from 26 M per day for up to 300 portions to 40 M per day for 4-500 portions. Rat der Stadt Chemnitz to the Königliche Kreishauptmannschaft zu Chemnitz, 4 Aug. 1916, doc. 90-91, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

^{xix} Philipp Stein, “Der Besuch der Massenspeisungen und die Lage der Lebensmittelversorgung,” *Beiträge zur kommunalen Kriegswirtschaft* 2, no. 30 (20 June 1918): 349-353.

^{xx} Landeslebensmittamt, 24 Oct. 1919, doc. 128, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

Table 4.8. Daily Public Kitchen Usage Statistics in Saxony (1915-1919)

| | 1915 | 1916 ^{xxi} | | | | | | |
|------------------|-----------------------|---------------------|-------|------------------------|------------------------|-----------------------|--------|--------|
| | | March | April | May | June | July | August | |
| Chemnitz | 3,000 ^{xxii} | 4,100 | 4,300 | 5,700 | 7,800 | 10,000 | 6,400 | |
| Dresden | 3,100* | | | 9,600 ^{xxiii} | 25,000 ^{xxiv} | 25,400 ^{xxv} | 20,500 | |
| Dresden Altstadt | | | | | | 15,000 | | |
| Dresden Neustadt | | | | | | 5,700 | | |
| Leipzig | >8,200† | >12,700† | | | | | | 22,233 |
| Löbau District | | | | | | | 4,000 | |
| Plauen | | | | | | | 2,900 | |
| Plauen District | | | | | | | 1,100 | |
| Zittau | | | | | | | 700 | |
| Zittau District | | | | | | | 3,300 | |
| Zwickau | | | | | | | 700 | |

The entries in these tables represent portions sold from “public kitchens,” including factory cafeterias that were provisioned by central kitchens but not work-based cantines that were entirely run and supplied by private employers. It is not always clear whether school cafeterias were included.^{xxvi} Numbers marked with an * are for kitchens run by the largest private philanthropy in Dresden, the Verein Volkswohl.^{xxvii} Numbers marked with a † represent yearly averages for the 18 municipal eateries in Leipzig but not the 9 “war kitchens” (hence the “>”).^{xxviii} Unless the primary sources suggested otherwise, I assumed the kitchens served once per day and closed on Sundays and holidays, for a total of 26 serving days per month and 310 serving days per year. All entries have been rounded to avoid the illusion of precision.

^{xxi} In August-September 1916, the State Food Office surveyed the district and city food offices; unless otherwise specified, the numbers come from docs. 81-137, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

^{xxii} This figure represents only the municipal eatery and not the 8 Kochschulen serving soldiers’ wives. The March through August 1916 figures for Chemnitz were calculated from the information given for the municipal eatery, the cooking schools, and the Volksküchen. Docs. 90-99, 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

^{xxiii} This composite figure represents the number of daily portions the newly opened (in April 1916) “Kitchens for everyone” served on 10 May 1916, plus the average number of daily portions the Verein Volkswohl served in 1916 (8,000). “Volksküchen für jedermann,” doc. 3, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD; “Die Arbeit der Volksheime 1918,” *Dresdner Nachrichten* Nr. 67 (9 March 1919), doc. 121, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

^{xxiv} This includes 17,000 from the “kitchens for everyone” and 8,000 from the kitchens for soldiers’ families and the unemployed. Dr. Matthes, “Die Abgrenzung des Besucherkreises,” in *Praktische Durchführung von Massenspeisung*, ed. Zentralstelle für Volkswohlfahrt, 55-65 (Berlin: Carl Heymann Verlag, 1916), 65.

^{xxv} Figure for 22 July 1916. Antwort des Ausschusses für Volksküchen zu Dresden auf die Anfrage vom 21. Aug. 1916, doc. 106, Nr. 23200 Massenspeisung Bd. 1, 10736 MdI, SHAD.

^{xxvi} There were at least 7 different kinds of public kitchen in Dresden: for soldiers’ families, for the unemployed, for the working class (run by the Verein Volkswohl), for the middle class, “for everyone” (*Küchen für jedermann*), for factory workers (that cooked food off-site for delivery), and for school children.

^{xxvii} E. P. “Die Dresdner Volksheime und Zentralküchen,” *DH* 15, no. 21 ([24 Feb. 1917]): 1; “Der Verein Volkswohl in Dresden,” *DH* 15, no. 36 (13 June 1917): 2; “Die Arbeit der Volksheime 1918,” *Dresdner Nachrichten* Nr. 67 (9 March 1919), doc. 121, Nr. 23201 Massenspeisung Bd. 1, 10736 MdI, SHAD.

^{xxviii} Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 148; Döhling, *Das Problem der Massenspeisung*, 61-62.

Table 4.8 (continued)

| | 1917 | 1918 ^{xxxix} | | | | | 1919 ^{xxx} | | |
|------------|------------------------|-----------------------------|----------------------|-------|-------|---------|---------------------|--------|---------|
| | | Jan. | Feb. | March | April | October | August | Sept. | October |
| Chemnitz | 4,000 ^{xxxix} | 3,400 | 5,300 | 4,300 | 3,500 | 16,200 | 7,200 | 7,900 | 8,400 |
| Dresden | | >10,000* ^{xxxixii} | | | | 65,600 | 28,900 | 24,300 | 20,200 |
| Dresden-A. | | | | | | | 7,400 | 3,700 | 2,800 |
| Dresden-N. | | | | | | | 13,000 | 8,100 | 6,200 |
| Leipzig | >10,700 [†] | >13,700 [†] | >12,400 [†] | | | 38,000 | 23,300 | 18,000 | 18,100 |
| Löbau | | | | | | | 13,500 | 6,300 | 3,400 |
| Zittau | | | | | | 8,800 | 8,300 | 3,100 | 1,500 |
| Zwickau | | | | | | | 700 | 350 | 0 |

The difficulty with rendering monthly or even weekly servings into daily portions is that the kitchens were open anywhere from 1 to 7 days per week. In the city of Zittau, for example, the same kitchen served two different groups: one on Monday, Wednesday, and Friday; the other on Tuesday, Thursday, and Saturday. School children are likely to have eaten every day at school-based feedings, but even workers at companies with meals provided by a central kitchen might not partake every day, depending on the menu, their budget, what they could purchase in shops, and how many ration cards they had left. Many communities introduced weekly subscriptions to reduce these daily fluctuations that frustrated both cooks and customers. The attraction of “number of daily portions” is that if we assume one portion per person, it estimates the number of persons and therefore the fraction of the population participating in the kitchens. Even if it were easier to calculate how many portions were served on an average day, however, it is harder to determine how many family members might have shared that meal. Therefore, this table should be read as an approximation of use of public kitchens during and after the war.

The usual narrative in both primary and secondary sources is that participation was greatest in early 1917 and then declined so much for lack of interest that many kitchens closed.^{xxxiii} According to Belinda Davis, “by the revolution, few remained in operation.”^{xxxiv} However, the numbers do not bear this out. For instance, Davis cites sources that claim usage in Berlin peaked at 152,000 participants per week in February 1917, while August Skalweit gives

^{xxxix} Figures for Chemnitz from Skalweit, *Kriegsernährungswirtschaft*, 49; October numbers in *ibid.*, 51. Dienemann, “Hygienische Maßnahmen,” 411, confirms the Oct. 1918 number for Dresden.

^{xxx} All 1919 numbers can be found in Landeslebensmittelamt, 5 Dec. 1919, doc. 134-135, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

^{xxxix} Calculated from January-April 1917 numbers from Skalweit, *Kriegsernährungswirtschaft*, 49.

^{xxxixii} This figure reflects the average daily midday portions that the Verein Volkswohl served over the entire year of 1918; it sold an additional 747,321 evening and Sunday meals. “Die Arbeit der Volksheime 1918,” *Dresdner Nachrichten* Nr. 67 (9 March 1919), doc. 121, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

^{xxxixiii} On the situation in 1917 and 1918: “Instead [of using public kitchens for the unemployed or the *Goulaschkanonen*] the utilization of factory canteens grew increasingly, to a lesser extent the other kitchens.” Dienemann, “Hygienische Kriegsmaßnahmen,” 411. On families preferring to eat at home: Landeslebensmittelamt, 24 Oct. 1919, doc. 128; and Dr. Fritsche to [Sä.] Arbeitsministerium, 4 Nov. 1919, doc. 131, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD. But cf. appeals to keep the kitchens open due to the lack of fuel for cooking at home: docs. 127, 129, 130, 134, 135, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

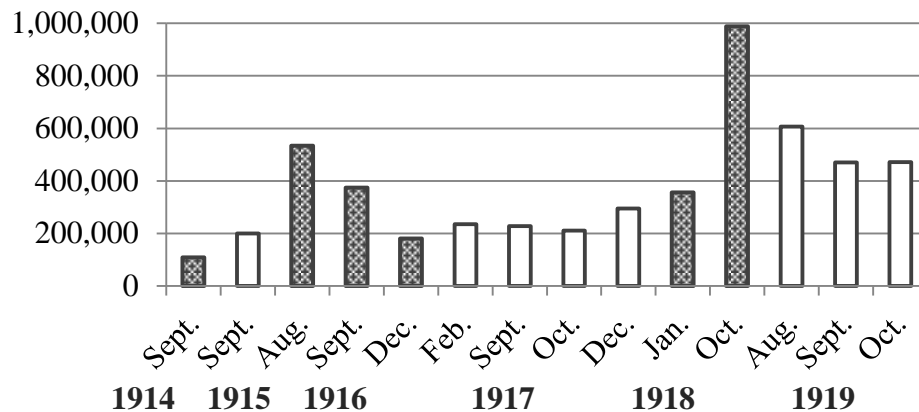
^{xxxixiv} Belinda Davis J., *Home Fires Burning: Food, Politics, and Everyday Life in World War I Berlin* (Chapel Hill: University of North Carolina Press, 2000), 154.

Table 4.8 (continued)

the figure of 180,000 portions per day at the beginning of 1917.^{xxxv} Just three pages later Skalweit lists an average daily sales for Berlin of 168,200 portions per day in October 1918, which Davis uses to produce graphs showing capacity and use of public kitchens in Germany.^{xxxvi} If there were hardly any kitchens open in Berlin in the fall of 1918, it is hard to imagine how they managed to serve almost as many meals then as during the accepted peak time of early 1917. Skalweit does acknowledge kitchens were not as well provisioned as demand may have required. Ironically, the emphasis he, Gustav Tenius, and contemporaries put on the cooking capacity of the kitchens—as evidence of their ability to meet demand, should it suddenly increase—may have contributed to this narrative of decline, as public kitchens cooked at 40-60% capacity.^{xxxvii}

Numbers for Dresden in 1917 are uncertain, but according to Skalweit, its kitchens served 65,600 portions per day in October 1918. That is 2.5 times as many meals as during the summer of 1916, when Massenspeisung was an object of so much public discussion, and 50 times as many as before the war. Similarly, the kitchens in Leipzig sold more meals in 1919, just before they closed in the first quarter of 1920, than in 1917. Lack of coal for fuel and heating, not lack of food supplies or demand, finally shuttered Saxony’s public kitchens.^{xxxviii}

Table 4.9. Meals Served per Month in Public Kitchens in Leipzig (1914-1919)^{xxxix}



^{xxxv} Skalweit, *Kriegsernährung*, 48, 51.

^{xxxvi} The participation percentage in Skalweit is incorrect: using the raw data he gives, one finds 8.12% of Berliners ate in the kitchens rather than 6.67% as printed. Furthermore, if one uses the 1917 census data instead of 1910, one finds a participation rate in Berlin of 9.64%. Participation rates for Dresden were still 12-13% in October 1918, down from its peak of 23% in April 1917. Skalweit, *Kriegsernährungswirtschaft*, 51.

In 1917, the populations were approximately Chemnitz 276,766; Dresden 512,847; Dresden-Altstadt 103,311; Dresden-Neustadt 116,473; Leipzig 542,845; Löbau District 93,402; Plauen 91,703; Plauen District 83,082; Zittau 35,040; Zittau District 74,762; Zwickau 70,932. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, *Haupt-ergebnisse der Volkszählung im Deutschen Reich am 5. Dezember 1917* (Berlin: Reichsdruckerei, 1918), 36-39.

^{xxxvii} Skalweit, *Kriegsernährungswirtschaft*, 51; Gustav Tenius, “Zur Statistik der Massenspeisungs-Einrichtungen,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 32-57 (Berlin: Reimar Hobbing, mid May 1917), 48-50.

^{xxxviii} Docs. 148-157, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

^{xxxix} These are if anything underestimates, as many of the bars given do not include the 9 war kitchens. Data compiled from Döhling, *Das Problem der Massenspeisung*, 61; Rat der Stadt Leipzig, to the Landeslebensmittelamt, 28 Aug. 1916, doc. 117, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD; Skalweit, *Kriegsernährungswirtschaft*, 51; Landeslebensmittelamt, 5 Dec. 1919, doc. 134-135, Nr. 23201 Massenspeisung Bd. 2, 10736 MdI, SHAD.

Chapter 5: Special Rations: How the War Came to Sick Rooms in Dresden

Artificial honey recipe: Cover 2 pounds of sugar in an earthenware or enamel pot with $\frac{1}{4}$ liter of water and add the juice (about 60 g) of a large lemon, which has been boiled and put through a fine sieve. Stirring continuously with a wooden spoon, heat the mass slowly until boiling and keep it at a very gentle simmer, skimming off any foam. Do not boil it too much or too long, or else the honey acquires a candy [caramel] taste. Once this mass has cooled it has a most pleasing taste, [but] one can impart the taste of honey when it is half cooled by adding a small amount of honey aroma, which is produced by [Saxon firms] and can be obtained from pharmacies or drug stores.⁷⁴⁹

Whoever would like to give his child something to bite on and doesn't want to give bread or biscuits can very easily bake cookies himself. Recipe: $\frac{1}{2}$ lb oatmeal that can be ground finer with a coffee mill if necessary, $\frac{1}{2}$ lb war wheat flour, 1 egg, $\frac{1}{4}$ lb sugar, $\frac{1}{8}$ liter milk (not more, likely somewhat less, water can also be used in place of milk), 1 [package] baking powder, and when possible $\frac{1}{2}$ of an eighth of a pound of butter. Vigorously beat egg, sugar, butter to a froth; add oats, milk, flour, and then the baking powder; knead the lump well; then roll [it] out, cut out any shape (wine glass), [and] bake on a sheet thinly coated with wax or fat.⁷⁵⁰

⁷⁴⁹ “Man übergieße 2 Pfund Zucker in irdenem oder Emailletopf mit $\frac{1}{4}$ Liter Wasser und fügt dazu den Saft (etwa 60 g) einer großen Zitrone, der vorher abgekocht und durch ein Haarsieb gegossen ist. Unter ständigem Umrühren mit Holzlöffel ist die Masse langsam bis zum Kochen zu erhitzen und 10 Minuten unter fortgesetztem Umrühren in ganz schwache Sieden zu erhalten, und wenn nötig, abzuschäumen. Man koche nicht zu stark und nicht zu lange, sonst erhält der Honig Bonbongeschmack. Schon diese Masse hat erkaltet einen höchst angenehmen Geschmack, den Geschmack nach Honig erteilt man ihr durch Zusetzen im halberkalteten Zustand einer kleine menge Honigaroma, das ... aus den Apotheken oder Drogerien bezogen werden kann.” Both recipes can be found in Franz Dienemann, *Mitteilungen des Ärztekollegiums beim städtischen Lebensmittelamt in Dresden*, Nr. 3 (July 1917), 7, Gruppe A Drucksachen bis Mai 1945, A 256/ II Lebensmittelkarten, 1915-1922, 17.2.1 Drucksammlung, Stadtarchiv Dresden.

⁷⁵⁰ “Wer gern seinem Kind etwas zu beißen geben will und will nicht Brot oder Zwieback geben, kann sich selbst sehr gut Keks herstellen. Rezept: $\frac{1}{2}$ Pfd. Haferflocken, die, wenn nötig, mit der Kaffeemühle noch klarer gemahlen werden können, $\frac{1}{4}$ Pfd. Kriegswheatmehl, 1 Ei, $\frac{1}{4}$ Pfd. Zucker, $\frac{1}{8}$ Liter Milch (nicht mehr, eher etwas weniger, an Stelle von Milch kann auch Wasser genommen werden), 1 Backpulver, dazu, wenn möglich $\frac{1}{2}$ Achtelpfund Butter. Ei, Zucker, Butter kräftig zu Schaum schlagen, Haferflocken, Milch, Mehl zusetzen, dann das Backpulver und nun tüchtig die Masse durchkneten, dann auftreiben, mit irgendeiner Form (Weinglas) ausstechen, auf einem Blech, das mit Wachs oder Fett dünn bestrichen [ist], backen.” Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 1. Aufl. (Jena: Gustav Fischer, 1918), 21-22. Unless otherwise noted, all citations from *Briefe* are from the first edition, whose foreword is signed August 1917.

In addition [to my complaint about not getting enough eggs], I speak for many others when I denounce the completely scandalous way in which the distribution of food for the sick has occurred. My youngest son, now five years old, fell ill with a very high fever on 2 January [1917]. The child refused to eat anything, [and] only with mild force could we get some milk into him. When his appetite returned somewhat after eight days, Professor Dr. H[einrich] Kraft prescribed milk for the child. At the same time he requested milk for eight days for my second son, who had come down with measles at the same time. I received notice of this on 27 January. The oldest boy had already returned to school, and the younger would have long since been buried, if we had not received some milk from compassionate persons.⁷⁵¹

The querulous father who wrote to the county government about the unconscionable delay in getting special milk rations for his two sons was none other than chemist Ragnar Berg. The boys' illnesses had made the family's precarious food situation worse: their general rations already did not suffice in times of health, so family members had been sending them food packages from Sweden and Turkey. In fact, little Alf may have contracted typhoid fever from a package that Berg's sister-in-law sent from Turkey, where she had recently been diagnosed as a healthy carrier of *Salmonella typhi*.⁷⁵² Alf subsequently caught measles from his ten-year-old brother Gunnar, and it was two months before he was out of bed, walking and talking again. At the height of the Turnip Winter and at a time when the boys' diet was of life-threatening concern to their parents, Else and Ragnar had to rely not on the planning of the government but on the generosity of neighbors and (possibly) black-market milk.

⁷⁵¹ "Ausserdem muss ich auch im Namen vielen Andere auf das aller schärfste gegen die überauskandalöse Art und Weise, in welcher die Zuteilung der Nahrungsmittel für Kranke geschiet gewesen ist. Mein jungster, heute 5 Jahre alt gewordenen Sohn erkrankte vom 2. Januar in luftigsten Fieber vor zunächst unbestimmte Hohe. Das Kind verweigerte jede Nahrungszuführen, nur etwas Milch konnte wir ihm mit mildem Zwang beitragen. Als sein Apetit sich wieder nach acht Tagen etwas hob, hat Herr Professor Dr. H. Kraft vorschriftsmässige Milch für das Kind beantragt. Gleichzeitig verlangte er für acht Tage Milch für meinen zweiten Sohn, der gleichzeitig an Masern erkrankt. Darauf habe ich am 27. Januar Bescheid bekommen. Der älteste Knabe ging damals schon wieder in der Schule [sic], und der jüngere wäre längst begraben gewesen, wenn wir nicht von barmherzigen Leuten etwas Milch bekommen hätten." Ragnar Berg to the Königliche Amtshauptmannschaft, 9 Feb. 1917, doc. 567-569 in Kopie-Buch Nr. 4, 12650 Personennachlass Ragnar Berg, SHAD.

⁷⁵² Berg to Bruder Walter, 23 Jan. 1917, doc. 535-536; to Doktor Kügelgen, 6 Feb. 1917, doc. 559-560; to Lene, 3 March, doc. 583-587; to Lieber Hofrat [Carl Röse], 19 March, doc. 616-617; and to Fräulein Elschen, 12 Sept., doc. 718-719, all in Kopie-Buch 4, 12650 Berg, SHAD. The most famous healthy carrier of this bacterium is of course Mary Mallon: Judith Walzer Leavitt, *Typhoid Mary: Captive to the Public's Health* (Boston: Beacon Press, 1996).

Since 1915, the Saxon government had made accommodations for the sick, the young, the old, the pregnant, and the institutionalized—in short, for categories of persons for whom regular food rations did not suffice physiologically and/or logistically. Generally a physician's affidavit, or for nursing mothers and infants a birth certificate, was required to receive permission to buy extra bread, bread spread (butter, jam, margarine), potatoes, or a "nutritional supplement" (malt, oatmeal, semolina). Children and the bearers of these special ration coupons were supposed to be first in line for milk (canned or fresh) due to its scarcity. It is likely that Ragnar Berg and Dr. Kraft had followed the appropriate procedure for requesting medically necessary milk, but the county government failed Alf and Gunnar because of poor organization and/or lack of supply due to the pressures that the blockade and military requisitions put on German agriculture.⁷⁵³

The Berg family lived outside Dresden in Loschwitz, in the Amtshauptmannschaft Dresden-Neustadt district. Next door in the city of Dresden proper, Dr. Franz Dienemann strove to prevent such delays and disappointments by organizing an efficient system for processing applications at the Patient Nutrition Division of the Food Office (*Krankenernährungsabteilung des Lebensmittelamtes*). He carried out an informational campaign among his medical colleagues about the ever-changing regulations and an educational campaign for city residents and potential patients on ways to eat healthfully despite the obvious limitations of the food supply. He also lobbied government officials such as the Nutrition Advisory Committee of the Saxon legislature (*Ernährungsbeirat*) to remember the sick in their discussions about the food economy.⁷⁵⁴

Dienemann was frequently frustrated with the slowness of the government, his fellow

⁷⁵³ For a similar story about the inability to get a half-liter of milk prescribed by a physician but told as a surrealist satire on bureaucracy, see O. Tempora, "Die Milchkarte," *Simplicissimus* 23, no. 50 (11 March 1919): 646.

⁷⁵⁴ Dienemann sat on this committee from April to November 1918, but only in September 1918 was he finally able to make a presentation about sick rations. Nr. 23191 Protokolle über Ernährungsbeirats-Sitzungen Bd. 2, 10736 Ministerium des Innern, SHAD.

physicians' inability or unwillingness to adhere to the rules, and the members of the public who refused to change their eating habits just because a war was on. In retrospect, he believed his office did the best that it could, given the circumstances.

In coaxing Dresden physicians to follow directions, Dienemann reminded them that the amounts they were allowed to prescribe were fairly liberal compared to other municipalities, and that the medical examining board of a large southern German city had called their patient care “exemplary” (*mustergültig*).⁷⁵⁵ Because this is the first in-depth study of the administration of sick rations in World War I and post-war Germany, I cannot determine whether Dresden was uniquely well organized. If Berg's complaint, Berlin police reports, and the public press can be considered at all representative of Germans' experience and opinions, then the implementation of sick rations throughout the country was even less successful than that of general rations in terms of the number of persons covered, the amount and appropriateness of the supplements, the speed of the application process, and the length of time the special rations extended.⁷⁵⁶ Then again, satisfied patients, parents, and physicians may have remained silent because they expected no less from the government, since they could not help themselves on the free market.⁷⁵⁷ Or the truly sick and starving may not have had a voice at all, as was the case for many residents of “closed” institutions such as state mental hospitals and prisons.

Historians have studied rationing for the general population, for the most privileged workers in war industries, and for the most nutritionally insecure persons (psychiatric inmates)

⁷⁵⁵ Dienemann, *Mitteilungen*, Nr. 3 (July 1917), 4.

⁷⁵⁶ From the Berlin area: Dr. Otto Hauser, “Mißstände bei der Krankenernährung,” *Vossische Zeitung* (Morgen) no. 182 (11 April 1917): 5; “Krankenversorgung,” *Vorwärts* 34, no. 279 (11 Oct. 1917): 3; “Anstaltskost in der Kriegszeit,” *Vorwärts* no. 348 (20 Dec. 1917): 3; Belinda Davis, “Food for the Weak, Food for the Strong,” in *Home Fires Burning: Food, Politics, and Everyday Life in World War I Berlin* (Chapel Hill: University of North Carolina Press, 2000), 159-189.

⁷⁵⁷ The State Health Office claimed that the work of the committee of physicians in Leipzig—reviewing almost 120,000 applications per year—“ran by and large without friction and relatively few complaints from treating physicians and the population.” Landesgesundheitsamt Sachsen, *Dritter Jahresbericht des Landes-Gesundheitsamtes über das Gesundheitswesen in Sachsen auf die Jahre 1914-1918* (Dresden: [Vogel], 1921), 151.

from the perspectives of social history, food studies, and political economy.⁷⁵⁸ We know that the national government issued recommendations for the sick not out of compassion but based on a calculated (yet very real) concern that widespread malnutrition would trigger an upsurge in tuberculosis morbidity and mortality.⁷⁵⁹ In Berlin, at least, the stigma attached to sick rations combined with the broken food economy to ensure that few eligible residents received extra rations—especially of milk, which marked them as weak, undeserving members of the national community.⁷⁶⁰ There is still room to explore this topic in other locations and from a medical history perspective, from the clinical reasoning for the class of rations that required a physician’s signature to the resulting ramifications for a politics of a (bio)medicalized social body.

This chapter demonstrates the ways in which the nutritional science that had been applied at individual bedsides in the decades leading up to 1914 was scaled up to accommodate large numbers of the sick. Dienemann occupied the unenviable position of having to mediate between three levels of government bureaucrats and a small constituency of vulnerable individuals,⁷⁶¹ between the economy of the nation and the economies of bodies that, according to his medical training, needed special nutritional attention. If the “standard” body was male, healthy, and

⁷⁵⁸ Gerald D. Feldman, *Army, Industry and Labor in Germany, 1914-1918* (Princeton: Princeton University Press, 1966); Avner Offer, *The First World War, an Agrarian Interpretation* (Oxford: Clarendon Press, 1989); Heinz Faulstich, *Hungersterben in der Psychiatrie 1914-1949: mit einer Topographie der NS-Psychiatrie* (Freiburg im Breisgau: Lambertus, 1998); Arnulf Huegel, *Kriegsernährungswirtschaft Deutschlands während des Ersten und Zweiten Weltkrieges im Vergleich* (Konstanz: Hartung-Gorre, 2003). Interestingly, historians have published relatively little on German military rations. But see Fritz Hartmann, *Die Heeresverpflegung*, Heft 11 of *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftliche Abteilung der Kriegsernährungsamts (Berlin: Reimar Hobbing, early May 1917); Peter Lummel, “Food Provisioning in the German Army of the First World War,” and Steven Schouten, “Fighting a Kosher War: German Jews and Kashrut in the First World War,” in *Food and War in Twentieth-Century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, 13-25 and 41-57 (Farnham, Eng.: Ashgate, 2011).

⁷⁵⁹ Matthias Erzberger, *Schädigung der deutschen Volkskraft durch die feindliche Blockade. Denkschrift des Reichsgesundheitsamtes, Dezember 1918* (Berlin: Gerhard Stalling, 1919), 21-23; Franz Bumm and Rudolf Abel, *Deutschlands Gesundheitsverhältnisse unter dem Einfluss des Weltkrieges*, 2 vols. (Stuttgart: Deutsche Verlags-Anstalt, 1928); Anne Roerkohl, *Hungerblockade und Heimatfront: die kommunale Lebensmittelversorgung in Westfalen während des Ersten Weltkrieges* (Stuttgart: Franz Steiner, 1991), 303-304.

⁷⁶⁰ Davis, *Home Fires Burning*, 159-169.

⁷⁶¹ Dienemann assumed that at any one time “the sick” constituted 2-3% of the national population, higher or lower in different locales based on the concentration of clinics and pensioners. He was particularly concerned about *Hauskranke*, the smaller subset of individuals living at home with some kind of diagnosis.

engaged in physical labor, the bodies this program confronted deviated from that norm: still growing and developing, pregnant or lactating, acutely or chronically ill, aged, or no longer mentally or physically fit to labor. The 70-kilogram standard man and his fractional equivalents for women, children, and the elderly used in explanations of nutritional requirements and for compiling statistics had always elided the differences in Germans' bodies and foodways, but the need for special rations for so many non-standard categories exploded this reductionist myth.

World War I changed the feeding of the sick, too. Special rations were simultaneously a delicate balancing act between medical principles, the community's food resources, cost to the individual, and what Belinda Davis has called "an insidious culture of selection" the war encouraged.⁷⁶² The planned economy forced the largely qualitative field of clinical dietetics into the quantitative mold of amounts measured in calories and grams, not in meals or servings. Before the war, doctors had prescribed sick diets based on their scientific understanding of pathological anatomy and physiology and on their empirical experience with patients' complaints. They had considered what irritated the digestive tract or the kidneys, what strengthened a weakened constitution, and what an invalid should be coaxed into eating or drinking. Now those foodstuffs might not be available and substitutions might have to be made. Furthermore, the centralized food system meant that an urban wife or mother could only "treat" a family member with home-made recipes by re-allocating the household's general rations, paying for a doctor's visit to get a certificate of ill health, turning to friendly neighbors, or relying on the barter or extortion of the black market.

According to the logic of the telescopic perspective, the ill and infirm were conceptually and even organically connected to their communities and to the nation. The bacteria that infected their lungs, the cancer that grew in their breasts, or the ulcers that ravaged their stomachs in

⁷⁶² Davis, *Home Fires Burning*, 160.

some sense afflicted the social body, because all of these individual bodies were being drawn together through their combined efforts to win the war, through the short and unequally distributed food supply, and through their (tenuous) belonging to *das Volk*. An insult to one was an insult to the many. Restoring health through special rations was therefore not merely a humanitarian gesture: the well had to be protected from the walking sick—and from those who consumed “too much.” Authorities like Dienemann had to balance granting some special rations to temper public unrest (like Ragnar Berg’s) but not so many or so much as to jeopardize general rations. Finally, feeding the invalided and institutionalized might have been the civilized thing to do, but the ultimate and overriding calculation was whether supplemental rations would eventually allow the patient to return to work—in war-important jobs most of all. Franz Dienemann’s writings demonstrate both the rhetorical struggle over the best or proper way to feed the German nation and the reality of compassionate (or harried) physicians prescribing extra foodstuffs for the hungry, sick, elderly, and/or pregnant bodies they confronted in their daily medical practices. The struggle between individual and collective good was waged over the bodies of Germany’s most vulnerable inhabitants.

The sources

Acquaintances remembered Dr. Franz Paul Richard Dienemann (1867-1938) as a dedicated physician.⁷⁶³ Born in Pößneck, Thuringia, he grew up in Dresden. After studying medicine in Leipzig, Strasbourg, and Erlangen, he returned to Dresden to practice in the Friedrichstadt city hospital. An unspecified illness prevented him from entering academia, so he passed the district

⁷⁶³ “Veränderungen im Mitgliederbestande 1937/38: Franz Dienemann,” in *Sitzungsberichte und Abhandlungen der Naturwissenschaftlichen Gesellschaft ISIS in Dresden. Jahrgang 1938 und 1939*, ed. Dr Alwein Schade, 53-54 (Dresden: H. Burdach, 1940). Almost the only source of biographical information is this eulogy that Heinrich Menzel, the new chairman of the ISIS scientific society, gave in September 1938. It relies on Dienemann’s son’s recollections and on personal impressions of the deceased, who had been scheduled to give a slide show of photographs from his trips to the Alps that night. ISIS refused to assimilate into the Nazi state apparatus (*gleichschalten*), hence my judgment that he was a moderate.

medical officer exam in 1895 and remained in public service until the end of his life. By World War I he had been promoted from district physician (*Distriktarzt*) to municipal physician (*Stadtarzt*), the number-two medical official in the district that encompassed the city.⁷⁶⁴ His moderate publication output included a medical dissertation on arteriovenous anastomoses and a study on the hygienic basis of Taylorism in the workplace.⁷⁶⁵ The good doctor remained spry into old age, and he continued his private practice in massage and physiatry (*Heilgymnastik*) until the day he died of a heart attack at the age of 70.⁷⁶⁶ Because he worked in Dresden until his death, had advanced to become a senior municipal medical officer (*Stadtobermedizinalrat*), but belonged to a scientific society that did not join the Nazi Party apparatus, Franz Dienemann appears to have been a politically moderate, conventionally trained physician open to holistic medical ideas.

From his position at the head of the Patient Nutrition Division, Dienemann wrote about rationing for both physicians and for the general public. Chief among his writings for medical colleagues were typed or printed notices mailed to the 472 physicians practicing in the city, instructing them on the most recent regulations and supplies.⁷⁶⁷ Forty of these *Memos from the Physicians Council of the City Food Office in Dresden (Mitteilungen des Ärztekollegiums beim städtischen Lebensmittelamt in Dresden)* appeared at irregular intervals from January 1917 until the City Food Office closed in September 1921 and offer a fascinating behind-the-scenes look at

⁷⁶⁴ Julius Schwalbe, ed., *RMKD 1900*, Teil II (Leipzig: Georg Thieme, 1900), 347; and *RMKD 1911*, Teil II (Leipzig: Georg Thieme, 1911), 454. On “Stadtarzt,” see Stadtarzt Dr. med. et phil. Otto Albrecht Neumeister, “Das Ärzte- und Apothekerwesen,” in *Wissenschaftliche Führer durch Dresden*, ed. Friedrich Schäfer, for the 79. *Versammlung Deutscher Naturforscher und Ärzte* (Dresden: v. Zahn & Jaensch, 1907), 254-258.

⁷⁶⁵ Franz Dienemann, *Ein Beitrag zur Kasuistik der arteriell-venösen Aneurysmen* at Friedrich-Alexander Univ. Erlangen (Erlangen: A. Vollrath’s k. b. Hofbruck, 1892); *ibid.*, *Die gesundheitlichen Grundlagen für gewerbliche Arbeit und Taylorsystem*, Veröffentlichungen der Dresdner Volkshochschule, Heft 4 (Dresden: Heinrich, 1920).

⁷⁶⁶ Physical medicine, which had had fallen in and out of favor among Saxon physicians since the early nineteenth century, experienced a resurgence in the 1880s. In 1919, a State Academy for Physiotherapy and Massage was opened to handle the increased demand of war wounded. Marina Lienert, “Die Staatsanstalt für Krankengymnastik und Massage,” *Ärzteblatt Sachsen* 5 (2009): 230-232.

⁷⁶⁷ Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 12. I have been unable to determine how many of Dresden’s physicians mobilized—possibly as high as 70%. Paul Weindling, “The Medical Profession, Social Hygiene and the Birth Rate in Germany, 1914-18,” in *Upheaval of War: Family, Work and Welfare in Europe, 1914-1918*, ed. Richard Wall and Jay Winter, 417-438 (New York: Cambridge University Press, 1988), 422.

the constant struggles of a local government to feed its citizens and of ordinary Germans to survive the war when the government failed. Dienemann also published articles in the medical press critiquing the sick ration orders coming out of Berlin and offering his experience to the physicians being asked to administer similar organizations in their cities.

For laypersons and potential patients, Dienemann wrote *A Physician's Letters on Nutrition to a Layperson*. According to the foreword, his non-medical colleagues at the City Food Office asked him to write a book so that they could understand the food situation from a doctor's perspective. In response, Dienemann composed his advice in the form of "letters from a physician," a genre that dates back at least to the eighteenth century in Europe.⁷⁶⁸ Both the first edition (finished in August 1917) and the slightly revised second edition (June 1918) are about 100 pages long and consist of fifteen "letters" written in an easy, conversational tone.

Dienemann plays himself as a family physician corresponding with a "dear friend," whom he addresses with the familiar German "Du." Dienemann styles the recipient—we do not read any letters from him—as a young man with an office job, wife, school-aged daughter and 6-month-old infant son. He fabricates a kind of a rapport with his imaginary pen pal by "quoting" from the other man's "letters" and responding to his "questions." I suspect that Dienemann chose a male correspondent out of a combination of propriety and the hope to engage both male readers and the women who were more likely to be purchasing and preparing family meals.

The reasons

In both special and general rationing, individualizing forces competed with collectivizing

⁷⁶⁸ A WorldCat search of "Briefe eines Arztes" produces a dozen examples written between 1770 and 1981; "letters from a physician" yields a result as old as 1749. Justus von Liebig published some editions of his popular treatise on "animal chemistry" as *Familiar Letters on Chemistry and its Relation to Commerce, Physiology, and Agriculture* (1843), *Chemische Briefe* (1844), and *Letters on Modern Agriculture* (1859). On how Liebig bridged the gap to his readers, Andreas Franzmann, "Der 'gebildete Laie' als Adressat des Forschers. Sequenzielle Analyse von Titel und Vorrede zur ersten Ausgabe von Justus von Liebig's 'Chemischen Briefen' von 1844," in *Wissenspopularisierung: Konzepte der Wissensverbreitung im Wandel*, ed. Carsten Kretschmann, 235-256 (Berlin: Akademie, 2003).

ones. In early 1917, August Skalweit defended the introduction of the semi-socialized food supply as an official measure to reduce economic inequality while acknowledging that equitable did not mean equal: “Sensible rationing cannot content itself with schematic allocation of equal per capita amounts” but required division of goods not just by head but also by age, work, and income.⁷⁶⁹ These individualizing demographic factors assumed varying physiological needs that multiplied under the clinical dietetic guidelines for conditions as diverse as pregnancy, diabetes mellitus, and tuberculosis. There was also a moral question: “Humanitarian considerations make it impossible for us to let invalids struggle for survival, to simply abandon the terminal cases to their fate,” Dienemann wrote in the medical press.⁷⁷⁰ As members of a civilized nation (*Kulturstaat*), Germans’ responsibility was to ethics as well as to economics.

Collectivizing forces included the desire to centralize and manage food resources “for the common good” and a utilitarian logic for distributing them that emphasized the labor that could win the war. The epitome of this trend was the introduction of supplements for hard(est) workers (*Schwer- und Schwerstarbeiter*) in July 1915 and for armaments workers under the Hindenburg Program (August 1916).⁷⁷¹ By the end of the war, utilitarianism had eclipsed the desire to treat medical conditions dietetically and to relieve the suffering of the ill and vulnerable. “The human resource was to be exploited on all levels,” writes historian Susanne Michl.⁷⁷² In response, as public rhetoric became increasingly collective, by necessity and choice actions became more

⁷⁶⁹ “Eine vernünftige Rationierung wird sich nicht mit der schematischen Zuweisung von gleichen Kopfanteilmengen begnügen können.” August Skalweit, “Kommunale Ernährungspolitik,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 7/8: Die Nahrungsmittelwirtschaft großer Städte im Kriege, 1-48 (Berlin: Reimar Hobbing, 3 March 1917), 39.

⁷⁷⁰ “Humane Gesichtspunkte sind es daher, die es uns unmöglich machen, die Invaliden des Lebenskampfes, die zu Tode Betroffenen, einfach ihrem Schicksal zu überlassen.” Franz Dienemann, “Ueber die Ernährung der Kranken im Kriege und ihre Grundlagen,” *DmW* 43, no. 13 (29 March 1917): 394-395, here 394.

⁷⁷¹ Adam Stegerwald, Richard Lenz, and Lucas Wiernick, *Die Schwerarbeiterfrage*, Heft 26/27 of *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts (Berlin: Reimar Hobbing, early Dec. 1917).

⁷⁷² Susanne Michl, *Im Dienste des “Volkskörpers”*: Deutsche und Französische Ärzte im Ersten Weltkrieg (Göttingen: Vandenhoeck & Ruprecht, 2007), 91.

individualistic. Hunger and profit propelled individuals, businesses, and governments to participate in the black market, whose decentralization of the food chain in no way served the common good.

The two recipes at the head of the chapter represent the ersatz and make-do economy of the kitchen in Germany during the second half of World War I and the first few years of the Weimar Republic. With butter and lard scarce, nutritional experts encouraged Germans to eat more sugar as a pure source of energy—for instance, as a bread spread.⁷⁷³ Real honey being in short supply and obtainable only at high prices, Dienemann borrowed a recipe for an artificial version from Munich nutritional chemist Theodor Paul (1862-1928). It uses the “Man nehme” construction Henriette Davidis made famous in her cookbooks and is an example of do-it-yourself substitution. Dienemann offered this homemade artificial honey as a cheaper version of the store-bought, manufactured kind and as a way for child-rich families to use the sugar they could not devote to canning because of the shortage of fruit. But who could find or afford a non-native luxury like lemons anymore?

By summer 1917, all the ingredients listed in both recipes except the lemon, baking powder, and honey aroma were rationed; in particular, oatmeal was almost exclusively guaranteed to children under the age of four as a carbohydrate-rich nutritional supplement for their growing bodies. Infants and toddlers were first in line for milk, especially if any whole milk was available. The oatmeal cookies (*Keks*) were a teething supplement, what with the scarcity of old bread for gnawing. They required two weeks’ worth of an infant’s summer 1917 ration of oats and eggs, half a week’s ration of flour and butter, almost two-thirds a daily ration of sugar, and one eighth of a daily ration of milk.⁷⁷⁴ By the time the second edition of the book was

⁷⁷³ Dienemann, *Briefe*, 34.

⁷⁷⁴ Ethel Cooper writes of a similar experience with oatmeal biscuits: “I have a recipe in Mrs Stowe’s cookery book

reviewed in early 1919, sugar rations had been increased by almost 100%, but breastfed babies received no milk at all, and only diabetics or those with bleeding ulcers were promised eggs.⁷⁷⁵ Everyone else had to purchase these things on the black market for exorbitant prices, raise cows or chickens themselves, or do without. As a “make-do” supplement in the face of a decreased bread supply, this may not have been a successful suggestion after all. These recipes typify a situation in which individuals had to pick up the government’s slack and demonstrate how such patchwork solutions almost inevitably failed.

Like so much of German food policy during the war, sick rations evolved from small, informal gestures to large, complicated mechanisms, and there seems to have been significant regional variation.⁷⁷⁶ In December 1915 the Physicians Council to the Dresden City Food Office began accepting requests for food supplements and educating doctors through meetings and journal notices.⁷⁷⁷ In May-June 1916 the Imperial Health Office (*Kaiserliches Gesundheitsamt*) in Berlin finally produced a report and some non-binding recommendations about the nutritional situation of the sick.⁷⁷⁸ But only at the beginning of March 1917, in the third year of the conflict, did the War Food Office (*Kriegsernährungsamt*, KEA) in Berlin issue requirements for unified sick rations across the empire and recommend every rationing district have a formal board

for them, just made of oatmeal and water! A very suitable recipe for these days. I have to leave out the butter because we so seldom have any, and I add a little sugar and a teaspoonful of egg-powder. Cookery books talk as if eggs and flour and butter were things that could be bought—so it is great luck to find some recipe that one can use.” Letter 52B, 29 July 1917, *Behind the Lines: One Woman’s War 1914-18. The Letters of Caroline Ethel Cooper*, ed. Decie Denholm (London: Jill Norman & Hobhouse, 1982), 208-209.

⁷⁷⁵ Franz Dienemann, *Briefe eines Arztes über Ernährung an einen Laien*, 2. Aufl. (Jena: Gustav Fischer, 1918); “Übersicht über die den Dresdner Einwohnern zustehenden Nahrungsmittelmengen” in *Mitteilungen*, Nr. 2 (June 1917), 10; Nr. 18 (Jan. 1919), 9; Nr. 21 (May 1919); Nr. 26 (Jan. 1920), 2.

⁷⁷⁶ Dienemann, *Mitteilungen*, [Nr. 1] (Jan. 1917), 2.

⁷⁷⁷ Franz Dienemann, “Die Versorgung der Kranken Dresdens. Mitteilung des Ärztekollegiums beim städtischen Lebensmittelamt in Dresden. Zu Punkt 2 der Tagesordnung zur Sitzung des Lebensmittelausschusses am 30. May 1919” (May 1919), filed with *Mitteilungen*, Gruppe A Drucksachen bis Mai 1945, A 256/ II Lebensmittelkarten, 1915-1922, 17.2.1 Drucksammlung, Stadtarchiv Dresden.

⁷⁷⁸ 26. Mai 1916—II 1541, Bd. 1, Ministerium des Innern. I. HA, Rep. 197 A, Preuß. Staatskommissar für Volksernährung, Abt. Ih, Nr. 9, Bd. 1-5 (20. Mai 1916 bis 1924). Acta betr. Lebensmittelversorgung Kranke und besonders bedürftiger Personen, sowie Verpflegung in den öffentlichen Kranken- und Irrenanstalten usw., Geheimes Staatsarchiv Preußischer Kulturbesitz, Berlin-Dahlem.

(*Prüfungsstelle*) staffed by an official physician. The Saxon Ministry of the Interior passed these instructions down the chain of command to City Physicians like Dienemann in April 1917 with the admonition that special rations were intended first to regenerate the ability to work, second to ameliorate suffering.⁷⁷⁹

Dresden was mostly allowed to continue the practices it had already established. In addition to managing fractions of generally rationed goods like milk and oatmeal, the Patient Nutrition Division also had to oversee the diabetic bread, malt, chocolate, and other items that were distributed as sick rations because they not available in sufficient quantities for the entire public. Between spring 1917 and fall 1919, the Dresden Patient Nutrition Division grew from four volunteer physicians, one city official, and 17 employees to eight physicians and even more clerks to receive, sort, and file the 3,000 applications per month from doctors on behalf of their patients.⁷⁸⁰ The office had received as many as 600 requests in one day.⁷⁸¹

From the medical perspective of clinical dietetics, the altered physiology of the sick required special rations. “Equality” in rations for them meant equal access to food they could eat, meaning different rations from those granted to the general population. Milk could sustain a child like Alf, whose fever had reduced his appetite. A woman with stomach ulcers and intestinal

⁷⁷⁹ Franz Dienemann, “Hygienische Kriegsmaßnahmen deutscher Städte. 8. Dresden,” *Öffentliche Gesundheitspflege* 3, no. 12 ([Dec.] 1918): 401-419, here 413.

⁷⁸⁰ In 1919, the committee consisted of Drs. Naether, Beschorner (a laryngologist), J. Heyde, Klopffleisch, Diestelhorst, Hermann Meyer, Alfred Cohn, Dietrich, and Päßle (an internist). Dienemann, “Die Versorgung der Kranken Dresdens.”

⁷⁸¹ Dienemann, “Ueber die Ernährung der Kranken im Kriege und ihre Grundlagen,” 395. After the war, the State Health Office published some numbers reflecting the enormous bureaucratic task of adjudicating requests for food for the sick: in Dresden-Neustadt-Land, where the Bergs lived, there were 10,050 applications from March through Dec. 1917, and 19,925 for the year 1918; in Dresden-Alstadt-Land there were 10,714 requests just from April to Dec. 1918. Landesgesundheitsamt Sachsen, *Dritter Jahres-bericht*, 151. The Zentralstelle für Krankenernährung in Berlin received many more applications: about 40,000 per month, including 15,000 new patients, in early 1917, and nearly 80,000 per month, with 20,000 new requests, in late 1918. The percentage of the population considered “sick” had grown from 2% before the war to 10% (160-170,000 persons). Dr. Martin Hirschberg, “Der gegenwärtige Stand der Krankenernährung in Berlin,” *BkW* 56, no. 9 (3 March 1919): 198-201, here 199.

catarrh could not live on tough bread and fibrous cabbage but only on milk and porridge.⁷⁸²

Bread and sugar were poison to the diabetic, whose body could better handle meat and fat. The bedridden exerted themselves less and therefore required fewer calories, while tuberculous patients needed more calories from all foods in order to fight off the infection, maintain their health, and reduce their risk of infecting others.⁷⁸³ These scientific facts were reduced to unattainable ideals under the strictures of the blockade and rationing system.

This was due in part to the fact that the utilitarian logic of rewarding service to the war effort eventually characterized sick rations (and later, pensions⁷⁸⁴). Dienemann praised the goal-oriented philosophy behind Saxony's supplements: "to restore the working capacity of patients as quickly as possible" by providing them "the most punctual and sufficient quantities of food within the limits of possibility."⁷⁸⁵ The *Memos* repeatedly reminded physicians to indicate "whether the patient is still working, whether he is bedridden, whether he will regain his working capacity[,] and his social position."⁷⁸⁶ Physicians Councils were openly willing to approve slightly larger supplements only for those who were going to recover their strength enough to go back to work but not for the permanently incapacitated.⁷⁸⁷ Wrote one district physician on why early cases of tuberculosis should be eligible for supplements but not cancer patients or the tuberculous elderly, "The basic principle must prevail that foods are only provided when they are

⁷⁸² In the same letter of complaint quoted from above, Ragnar Berg mentioned a woman with these conditions whose physician had prescribed her this diet for the previous 8 years. The local government had granted her a ration of just 1 lb of semolina per month and no milk. Berg to the Königliche Amtshauptmannschaft, 9 Feb. 1917, doc. 567-569 in Kopie-Buch Nr. 4, 12650 Berg, SHAD.

⁷⁸³ "Es ist dabei ziemlich gleichgültig, was der Patient ißt, es kommt nur darauf an, daß er recht viel ißt." Friedrich Müller, "Lungentuberkulose," in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 7. Aufl., 260-288 (Jena: Gustav Fischer, 1911): 284.

⁷⁸⁴ Paul Lerner, *Hysterical Men: War, Psychiatry, and the Politics of Trauma in Germany, 1890-1930* (Ithaca: Cornell University Press, 2003).

⁷⁸⁵ Dienemann: "'tunlichst rasche Wiederherstellung der Arbeitsfähigkeit der Kranken,' durch ihnen 'innerhalb der Grenzen des Möglichen rechtzeitig und ausreichend zur Verfügung zu stellende Lebensmittel.'" *Mitteilungen*, Nr. 3 (July 1917), 1.

⁷⁸⁶ "Wichtig ist uns, ob der Kranke noch arbeitet, ob er bettlägerig ist, oder ob er wieder arbeitsfähig wird und seine soziale Lage." Dienemann, *Mitteilungen*, [Nr. 1] (Jan. 1917), 2.

⁷⁸⁷ Dienemann, *Mitteilungen*, Nr. 2 (June 1917), 2.

absolutely necessary for recovery—it does not depend on the individual but on what he can still accomplish for the general public.”⁷⁸⁸ Dienemann did clarify that “work” should be interpreted in the broadest possible sense to include housework (women) and schoolwork (children).⁷⁸⁹ As the “difference” that drove sick rations (altered or pathological physiology) was subsumed by the difference that drove general rations (assumed caloric expenditure), the primary utility in wartime Germany came to be productive labor. The higher-than-normal rations for both the (temporarily) sick and the working were justified by the assumed end: victory on the battlefield.

Implementing special rations during the shortage of food required Germany’s physicians to compromise. Franz Dienemann knew it would be difficult to convince his colleagues to prescribe for collective or future health when individual and present sickness, misery, and hunger looked them in the face every day. But in the current situation, he agreed with the Saxon Ministry of the Interior that the best use of scarce resources was not to treat everyone equally, nor to try to alleviate the most severe suffering with extra rations, but to make sure everyone had what they needed (just enough to live on) and to economize the rest (provide physiological if not psychological satisfaction for those who worked).⁷⁹⁰ Dienemann was willing to compromise the best medical care for any one patient in order to provide some kind of aid in the form of special rations to as many patients as possible. But it was up to the city’s doctors to turn the municipal physician’s pronouncements into action, and his repeated pleas (detailed below) reveal what a struggle this was. Dienemann implored Dresden’s doctors to see the bigger picture with which he was confronted as a public official, to look beyond an individual patient’s bedside to see the

⁷⁸⁸ “Maßgebend ist aber der Grundsatz, nur dann Nahrungsmittel zuzuweisen, wenn sie zur Wiedergenesung unbedingt nötig sind—es kommt nicht auf den Einzelnen an, sondern darauf, was er der Allgemeinheit noch leisten kann.” Dr. med. Beintker, “Ueber Nahrungsmittelzuweisungen an Tuberkulöse,” *DmW* 45, no. 13 (27 March 1919): 359. Beintker was a Kreisarzt in the city of Dramburg (Drawsko Pomorskie) in the Prussian province of Pomerania.

⁷⁸⁹ Dienemann, *Mitteilungen*, Nr. 19 (Feb. 1919), 1.

⁷⁹⁰ Dienemann, *Mitteilungen*, Nr. 18 (Jan. 1918), 7.

hundreds of patients in institutions without recourse to the open market and to the thousands of households from whose allotments the special rations were drawn. This episode reminds us that discourse is not action, and that during World War I collective-good rhetoric was still sometimes easier said than done.

A food rationing system based on metabolic science and medical physiology was by design unequal, because it addressed a nation of embodied citizens whose differences on the levels of their cells and organs were expressed in the differences on their breakfast and dinner tables. The logic of the telescopic body explains the tension between the individualizing and collectivizing forces I have enumerated here. Indeed, it is almost too obvious to notice: it mattered whether this “lunger” got more butter or that fever patient went back to work because while physicians treated individual patients, the planned economy affected millions. It mattered because the milk Berg wanted for his sons had to come from the general food supply, such that the more the authorities granted to the sick, the less there was left for everyone else. Individually, one grocer or streetcar driver might or might not contribute to the war effort. But each recipient of sick rations who recovered not only returned to his or her place in the labor pool, s/he also returned to less-generous general food rations. Taken in aggregate, the thousands of Germans in each locale who benefitted from special rations were easy to see as a drain on the local food supply, which under the rubric of surplus and subsidized districts was also the national food supply.

When in May 1919 the Physicians Council defended itself against criticisms from the judiciary committee of the Dresden City Council, they drew from four of the five vocabularies behind rationing: physiological difference, collectivist rhetoric of stewarding the common good, utilitarian language of protecting the capacity for productive labor (*Arbeitskraft*), and a

humanitarian appeal on behalf of society's most vulnerable (missing: economic parity). They argued that they had advocated for the weakest members of the community "and above all prevented, to the best of [their] ability, every misuse of the nutritional capital belonging to the collective in the interest of the individual."⁷⁹¹ Even though the planned economy had been relaxed after the fighting had ceased, "for the general good" they had chosen to devote the available surplus to building up working strength rather than "merely" alleviating suffering. As general rations fluctuated, the Physicians Council found it more important to approve small supplements (¼ liter milk per day, ½ pound oats per week) for "weak" individuals who could be kept or made strong enough to work than to direct their limited resources toward the severely ill who had no chance of recovery. This difficult decision to give less to certain persons in favor of others had been normalized as the way to ensure the survival of the many at the expense of "a few." Medical judgment and the humanitarian impetus were markedly less pronounced.

The rations

The goals of economic parity, accommodations for physiological differences, "the greater good," enhanced productivity, and humanitarianism are reflected in a non-exhaustive list of the diagnoses that entitled Dresdeners to supplemental food (and sometimes coal and soap) rations: acute and treatable conditions (bleeding gastrointestinal ulcers, severe fevers, recuperation from serious surgery), chronic but manageable conditions (most cases of diabetes mellitus and tuberculosis), and terminal conditions (chronic renal disease, decompensated heart failure, cancer cachexia). Unacceptable diagnoses included anemia, prostatic hypertrophy, and unscientific descriptions such as "kidney disease," "stomach disorder," or "bilious complaint."⁷⁹² According to Dienemann's sarcastic assessment in the medical press in March 1917, "weakness" was

⁷⁹¹ Dienemann: "und vor allem jede mißbräuchliche Verwendung des der Allgemeinheit gehörigen Nahrungsgutes im Interesse Einzelner nach Kräften zu verhindern." "Die Versorgung der Kranken Dresdens," 1.

⁷⁹² Dienemann, *Mitteilungen*, [Nr. 1] (Jan. 1917), 3; Nr. 3 (July 1917), 3.

likewise too vague a category to deserve its own special rations category, as the general populace were merely unused to the reduction in their abundant pre-war diet and wrongly believed that anyone who could no longer eat until s/he was satisfied (*sattessen*) would keel over.⁷⁹³ But like so many others, by June 1917 he had changed his tune, and “weak” (malnourished) children and poor adults became eligible for supplements like oat products (*Hafernährmittel*). When it became obvious that medical indications could not be fulfilled, Dienemann tried to balance the drive toward productivity with basic humanitarianism and the fluctuating food supply with a growing number of individuals who could be classified as deserving: the more patients admitted to the rolls, the less each one could expect to receive.

There were not just questions about who was eligible but about what was rationed. “The most unbelievable ideas about patient nutrition continue to exist among the public,” chided Dienemann in *A Physician’s Letters*.⁷⁹⁴ He agreed some illnesses required a low diet but thought it was overkill when concerned relatives pressed “easily digestible foods” like eggs, meat broth, veal sweetbreads, and calf brain on the sick. Prepared properly, he insisted, almost any foodstuff could be made easy to digest; at least as important was to make the menu appetizing and varied. Because von Mering and Krehl’s textbook continued to propagate the idea of foods that were easy or hard to digest,⁷⁹⁵ this sounds like a rationalization for the benefit of poorer families who could not afford those delicacies. Dienemann continued, “Obviously false is the notion that everyone who is sick has a right to higher rations.”⁷⁹⁶ He tried to limit demand by reminding laypeople and doctors alike that most patients needed only 1500-2200 daily calories if

⁷⁹³ Dienemann, “Ueber die Ernährung der Kranken,” 294.

⁷⁹⁴ “Über die Krankenernährung bestehen im Publikum noch die unglaublichsten Vorstellungen.” *Briefe*, 90.

⁷⁹⁵ E.g. Hugo Winternitz, “Krankheiten des Magens,” in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Aufl., vol. 1, 421-476 (Jena: Gustav Fischer, 1922).

⁷⁹⁶ “Selbstverständlich ist es ein Irrtum, daß jeder, der krank ist, zu Mehrbezug berechtigt sei.” *Briefe*, 91.

homebound.⁷⁹⁷ Sick rations had to account for both the physiological abilities of the patient and the delivery capabilities of the rationing district.

To Dienemann's exasperation, most government officials were no better about organizing rations "scientifically":

Regarding the concerns of the authorities I frequently cannot avoid the impression that they are beginning from incorrect presuppositions, as if the old idea still prevailed that there is a particular diet, a specific kind of nutrition that every sick person needs by virtue of his being ill. We physicians have long since given up a *Krankenkost* in this sense. Soups for parturient women and the sick don't exist anymore, but the opinion still haunts us that hearty food equal eggs, meat, or even "bouillon."⁷⁹⁸

As we saw in Chapter 1, soups for pregnant and nursing women went back at least to the eighteenth century, and "bouillon" as a strength-giving food was Justus von Liebig's contribution to German cookery.⁷⁹⁹ The bureaucrats who found themselves designing the nation's menus were operating under the dietetics model embraced by the medical mainstream in the mid-nineteenth century—and still found in cookbooks and advertisements into the twentieth century—but replaced by the 1890s in hospital practice and in the writings of self-consciously forward-thinking physicians like Ernst von Leyden and Dienemann with individualized diets not unlike those long touted by alternative medical practitioners. Such meal plans ideally consisted of individualized combinations of "easily digestible" foods like milk, eggs, young vegetables, and toasted bread, most of which was admittedly unobtainable during the war. Nevertheless, from his experience with patients living at home rather than in an institution, Dienemann found the officials' ideas of "sick" and "digestible" too restrictive. Why did they give pregnant and new

⁷⁹⁷ Dienemann, *Briefe*, 90-93.

⁷⁹⁸ "Ich kann mich gegenüber der Sorge der Behörden um die Kranken des Eindrucks nicht erwehren, als ginge man an diesen Stellen von irrigen Voraussetzungen aus, als herrschte da noch vielfach die alte Vorstellung von der ganz besonders gearteten Kost, der besonderen Ernährung, die jeder Kranke, als Kranker an und für sich, bedürfe. Wir Aerzte haben ja längst eine Krankenkost in diesem Sinne abgeschafft. Wochen- und Krankensuppen gibt es nicht mehr, aber vielfach spukt doch bei uns noch die Anschauung, kräftige Ernährung = Eier, Fleisch, wenn nicht gar 'Bouillon.'" Dienemann, "Ueber die Ernährung der Kranken," 395.

⁷⁹⁹ Ulrike Thoms, *Anstaltskost im Rationalisierungsprozess. Die Ernährung in Krankenhäusern und Gefängnissen im 18. und 19. Jahrhundert* (Stuttgart: Franz Steiner, 2005).

mothers bread but consider this indigestible (*nicht zuträglich*) for the sick living at home?, he asked his colleagues. The working sick needed extra carbohydrates and fat, too. They were not as incapacitated as hospitalized patients, and exerting the effort to work strained their bodies, just like those of pregnant women or “hard workers.”⁸⁰⁰

There were three ways for ailing Dresdeners to receive what special rations were allotted to them. The standard method was to use “Form B.” In order to reduce fraud, the Physicians Council would only accept those that the patient’s physicians had filled out, complete with a history of the present illness and the patient’s socioeconomic status. The physician was supposed to mail the confidential form, postage paid, to the Patient Nutrition Division, where Dienemann or one of the volunteer physicians approved, modified, or denied the requested supplement(s) and amount(s). Usually only one extra ration was allowed (say, extra bread or canned milk), except cases of tuberculosis or diabetes mellitus, which could get 2-3 supplements at one time and more if there were extenuating circumstances. Dienemann was pleased that it took no more than 48 hours to get the special coupons to their recipients, who could use them starting the next Tuesday when purchasing goods either at their neighborhood shop or at an approved central location. (A “week” of sick rations began on a Tuesday.) All requests were granted for a defined period of time (e.g. 2-4 weeks for convalescence after surgery).⁸⁰¹

In particularly urgent cases the doctor could order by prescription (or after January 1918, by a preprinted short form) up to 1 liter of milk or a ½ pound of oat flour directly from certain shops. The sick person could then receive the food or drink the same day and for a few succeeding days without waiting for approval. If the prescription extended beyond a Sunday, then the longer Form B also had to be used, and all these requests had to be counted after the fact, so that

⁸⁰⁰ Dienemann, “Ueber die Ernährung der Kranken,” 395.

⁸⁰¹ Dienemann, *Mitteilungen*, Nr. 3 (July 1917), 3.

the Patient Nutrition Division knew how much of its precious stores were still available. Of all the facets of sick rations in Dresden, this one gave Dienemann the most trouble, because the city's doctors developed the habit of prescribing "urgent" milk whenever patients asked for it. "Ugly scenes have resulted from [over-prescribing the small supply of milk], in part from individuals who claim they need it urgently because they cannot drink their coffee black," he reported with exasperation in July 1918.⁸⁰² Dienemann vacillated between blaming his colleagues for their ignorance and charging them with neglecting the greater good by trying to get around rules they found too restrictive or with which they outright disagreed. Of course it is entirely possible that they simply could not keep up with the numerous and ever-changing rules.⁸⁰³

Physicians and nurses could give out certain supplements directly to "weak" individuals with a simple prescription and no form from the Physicians Council.⁸⁰⁴ In November 1918, Dienemann confirmed that physicians could write themselves prescriptions without the counter-signature of another doctor. On account of their overwork during the influenza epidemic, he recommended the two-pound cans of imitation lard (*Schmalz-Ersatz*) that could be had for 8 M 25 ⸘.⁸⁰⁵ "This is another one of those foods," wrote Dienemann, "that should benefit those individuals in particular who are weak but not yet sick in the sense that they are already being cared for by the Patient Nutrition Division—rather those whose condition threatens [to deteriorate], or for those for whom in the opinion of the physician the guaranteed amount [of general

⁸⁰² "Es sind unliebsame Szenen infolgedessen dort hervorgerufen worden und gerade zum Teil von Personen, die die Milch nach ihrer Aussage nur deswegen dringlich bedurften, weil sie ihren Kaffee nicht schwarz trinken könnten." Dienemann, *Mitteilungen*, Nr. 11 (July 1918), 1.

⁸⁰³ Professor Kraft requested standardization of sick rations on account of the difficulty of complying with the frequent rule changes. Page [7], Niederschrift über die 7. Sitzung des Ernährungsbeirats vom 3. August 1916, doc. 87-95, Nr. 23189 Protokolle Bd. 1, 10736 MdI, SHAD.

⁸⁰⁴ Dienemann, "Die Versorgung der Kranken Dresdens."

⁸⁰⁵ Dienemann, *Mitteilungen*, Nr. 14 (Nov. 1918). In Berlin, infant clinics likewise could give predetermined amounts of supplements like oatmeal or condensed milk to their clientele of children under the age of six years. Hirschberg, "Der gegenwärtige Stand der Krankenernährung in Berlin," 201.

rations] does not suffice.”⁸⁰⁶ The doctors must have taken him up on the offer, for another newsletter came out the same month announcing the imitation lard supply had been exhausted.⁸⁰⁷

By June 1917, bread, flour, meat, “cooking fat” (*Speisefett*), potatoes, milk, cheese, pasta, sugar, and semolina were rationed for the general population. In addition to certain amounts of these rations based on their age, the “sick” could receive extra milk, butter, eggs, and occasional goods. Special rations were either supplements (*Zusätze*) or substitutes (*Ersätze*). Imitation lard was a supplement, an additional foodstuff to strengthen or enliven an otherwise lean and monotonous diet. Other one-time offers included rare shipments of chocolate and one thousand bottles of Hungarian red wine that the city purchased and which were available in March 1918 for 5 Marks with a doctor’s order.⁸⁰⁸ In May the bottles went up to 6 Marks each, but “those of lesser means” (*Minderbemittelte*) could get a coupon for 3 Marks per bottle.⁸⁰⁹ Demand was apparently low, either because physicians were not prescribing it or because patients could not afford it (5 Marks was a whole day’s income for someone making a poverty wage of 1900M per year or less). By September the remaining bottles went on the free market, although poor patients could still get a reduced price.⁸¹⁰

The most consequential supplemental rations (*Zusätze*) were those for tuberculosis patients, who in the pre-antibiotic age were treated with heliotherapy (fresh air and sunlight) and diet (overnutrition). They were supposed to consume as many calories as possible from any source to build up their strength and immune systems to fight the infection and to counteract the

⁸⁰⁶ “Auch diesmal soll dies Nahrungsmittel vor allem solchen geschwächten Personen zugute kommen, die noch nicht krank sind in dem Sinne, daß sie bereits von der Abteilung für Krankenernährung mit Zulagen versorgt werden, sondern es zu werden drohen, oder für die nach Ansicht des Arztes die gewährten Mengen nicht ausreichend sind.” Dienemann, *Mitteilungen*, Nr. 12 (Sept. 1918), 3.

⁸⁰⁷ Dienemann, *Mitteilungen*, Nr. 15 (Nov. 1918).

⁸⁰⁸ Dienemann, *Mitteilungen*, Nr. 8 (9 March 1918). Tannin-rich red wine was supposed to be good for counteracting intestinal complaints, especially those caused by soggy, adulterated war bread. Erzberger, *Schädigung*, 63-66.

⁸⁰⁹ Dienemann, *Mitteilungen*, Nr. 9 (May 1918), 1.

⁸¹⁰ Dienemann, *Mitteilungen*, Nr. 12 (Sept. 1918), 3.

wasting effect of active tuberculosis.⁸¹¹ In the 1911 edition of von Mering and Krehl's *Textbook of Internal Medicine*, Friedrich Müller (1858-1941) had recommended 1 liter of milk per day,⁸¹² but under the planned food economy these patients joined a long line of milk-deserving individuals, behind infants, pregnant and nursing mothers, diabetics, and those with severe fevers or organic ailments that required a bland, liquid, or semi-liquid diet (milk as substitute for other foods).⁸¹³ The neediest patients were those with tuberculosis, diabetes, and severe gastric complaints,⁸¹⁴ and it is easy to imagine that they suffered even more from the reduction in milk in Dresden during the war than the general population.

In Dresden, physicians requested supplemental TB rations on colored forms, and the coupons were mailed directly to the patient to decrease the risk of infection at the central pick-up location.⁸¹⁵ On its own initiative, the Physicians Council had been prescribing generous weekly supplements to tubercular individuals living at home, for example in March 1917:

Pulmonary tuberculosis grade I, unable to work, recovery of strength to work probable, poor social standing; allowance: 7/2 liter milk, 1/8 pound butter, 1/2 pound oat flour.⁸¹⁶

But after the War Food Office in Berlin released new regulations that month, Dienemann complained to the medical press that the new rules privileged convalescence over work:

⁸¹¹ Flurin Condrau, "Der medizinische Diskurs über die Heilbehandlungen für Tuberkulose," in *Lungenheilstalt und Patientenschicksal: Sozialgeschichte der Tuberkulose in Deutschland und England im späten 19. und frühen 20. Jahrhundert* (Göttingen: Vandenhoeck & Ruprecht, 2000), 119-164. Surgery was rare until about 1930, 133-134.

⁸¹² Müller, "Lungentuberkulose," 281-288.

⁸¹³ Allotted amounts of specially rationed milk ranged from a quarter liter per day for pancreatic afflictions to half a liter per day in acute nephritis to three-quarters or even one liter per day for those taking a milk cure. Individuals with a diagnosis of tuberculosis generally received half a liter of milk, while those with diabetes had to make do with sugar-free condensed milk. Dienemann, *Mitteilungen*, Nr. 18 (Jan. 1919), 6.

⁸¹⁴ Dr. Leopold Kuttner, "Zur weiteren Regelung der Krankenernährung während des Krieges," *DmW* 44, no. 8 (21 Feb. 1918): 203-206, here 204. This lecture to the Medical Association of the Province of Brandenburg and the City of Berlin held on 18 Jan. 1918 followed one by Undersecretary Dr. Müller of the KEA on "Versorgungsfragen" and explicated the rules for sick rations in Berlin; see "Zur weiteren Regelung der Krankenernährung während des Krieges," *DmW* 44, no. 9 (28 Feb. 1918): 228-231 for its conclusion.

⁸¹⁵ Dienemann, *Mitteilungen*, Nr. 6 (Dec. 1917), 3.

⁸¹⁶ "Lungentuberkulose I, nicht arbeitsfähig, Wiedererlangung der Arbeitsfähigkeit wahrscheinlich, schlechte soziale Verhältnisse; Zulagen: 7/2 Liter Milch, 1/8 Pfund Butter, 1/2 Pfund Hafermehl." Dienemann, "Ueber die Ernährung der Kranken," 396.

institutionalized TB patients were granted 1 liter of milk and 4 eggs per week, while those living at home were granted at most ½ liter of milk per week and eggs only if there was a surplus.⁸¹⁷

Not only did his patients have long forms to fill out, but they often worked and needed the extra calories more than sanatorium inhabitants, who probably spent the days lying in chaise lounges in the sun as part of their physician-mandated heliotherapy. Dienemann did not think it right that sanatorium directors could order as much as they deemed necessary for their charges, who were not threats to public health, unlike tuberculous individuals living at home.

The challenge of coordinating in- and out-patient rations was difficult whether the food situation was bad or good. As TB supplements increased in amount and duration (from 8 to 12 weeks), so did the barrier for receiving them.⁸¹⁸ By the beginning of 1918, patients had to furnish a sputum sample in a container provided by the welfare police so that a doctor's microscopic examination attesting to the presence of bacilli could accompany further applications.⁸¹⁹ Three tiers of entitlement became five, then six.⁸²⁰ By summer 1919, the food situation had improved enough that TB rations now included meat or bacon and "fat" (presumably lard, since butter was allotted separately), but this came with an even higher level of surveillance. The Patient Nutrition Division had begun reporting individuals whose physicians had requested particularly generous supplements to the lung clinics; if the patient did not agree to enter a sanatorium to relieve the threat of spreading the infection, their sick rations would be cut off. In other words, as long as the blockade continued, a person had to be quite sick to get extra rations, but because both the food supply and the immune resistance of the population remained low, those individuals also

⁸¹⁷ "Warum ein Tuberkulöser in Anstaltsruhe 1 Liter Milch und 4 Eier bedarf, wenn er arbeitet, aber nur höchstens ½ Liter und Eier nur, wenn Ueberfluß, erhalten kann, sind nicht die einzigen Seltsamkeiten." Franz Dienemann, "Die einheitliche Regelung der Krankenernährung im Reich," *DmW* 43:1, no. 18 (3 May 1917): 560.

⁸¹⁸ Dienemann, *Mitteilungen*, Nr. 6 (Dec. 1917), 3.

⁸¹⁹ Dienemann, *Mitteilungen*, Nr. 7 (Jan. 29, 1918).

⁸²⁰ Dienemann, *Mitteilungen*, Nr. 18 (Jan. 1919), 4-5; Nr. 22 (June 1919), 1-2.

risked losing their personal freedom via institutionalization—“for the greater good.”⁸²¹

Other sick rations were substitutes (*Ersätze*), either for “guaranteed” rations that could not be filled or for rations the person would not, should not, or could not eat. These usually required trading in the unusable coupons. For example, if a mother could not find whole milk, her infant’s physician might prescribe one package of the dried skim milk protein powder Plasmon in exchange for a ½ liter-worth of whole milk cards, or else one package of the milk-fat nutraceutical Ramogen in exchange for whole milk cards totaling 3 liters.⁸²² Vegetarians were allowed to trade in their meat cards for foods they would eat.⁸²³ The War Food Office had merely granted diabetics higher sick rations, but Dienemann praised the fact that Saxony (and Baden-Baden) allowed vegetarians’ unused meat rations to be given to diabetics, whose health depended on the right kind of calories rather than simply on more of them. By the same Ministry of the Interior order, they were also allowed to exchange half of their bread ration for diabetic (low-carbohydrate) bread, but the only milk they could be promised was sugar-free condensed milk⁸²⁴

To balance out the foods diabetics could or should not eat, the Physicians Council created three categories of diabetic rations to match the three medical categories (mild, moderate, severe). Those with good control of their glycosuria could get ⅛ pound (60 g) of butter and an extra 250-500 g of meat per week (as long as the general meat ration did not exceed 200 g). In symptomatic cases with glycosuria, patients had to surrender their sugar cards to get 3/8 pound of butter and the extra meat. Severe diabetics had to give up both their sugar cards and the half of

⁸²¹ Dienemann, *Mitteilungen*, Nr. 22 (June 1919), 4. Dienemann only says that the tuberculous will be reported, not that they will be coerced into institutionalization and their supplements revoked, but this is implied. The Medizinalamt in Berlin had been strong-arming TB cases this way since at least early 1918. Kuttner, “Zur weiteren Regelung der Krankenernährung,” 205-206. According to Dr. Hirschberg, three quarters of those sent for follow-up testing at the TB clinics had no sign of active disease, but almost half of these were nutritionally needy anyway. Hirschberg, “Der gegenwärtige Stand der Krankenernährung in Berlin,” 200.

⁸²² Dienemann, *Mitteilungen*, Nr. 6 (Dec. 1917), 1-2.

⁸²³ Dienemann, *Mitteilungen*, Nr. 2 (June 1917), 4.

⁸²⁴ Dienemann, *Mitteilungen*, Nr. 2 (June 1917), 4; Nr 18 (Jan. 1919), 6.

their bread cards they couldn't use for low-carbohydrate bread in order to receive 320 g of butter (almost $\frac{3}{4}$ pound) and up to five eggs per week, a truly precious commodity. Because of the generosity of these rations, Dienemann had found it necessary to check in with the families every month to prevent their continuing to use the special coupons if the recipient died (usually of ketoacidotic coma or of tuberculosis). He confessed in the medical press that they still had not found a way to do this without offending either the diabetics or the recently bereaved.⁸²⁵

One patient population that literally could not stomach wartime rations were individuals with gastric and intestinal conditions like ulcers or colitis. Everyone bemoaned the loss of refined wheat baked goods during the war—a matter of status as well as of taste and habit—as grains were ground to 94% (almost whole-grain flour) rather than 65% (“refined” flour). In the spring of 1917, the War Food Office allowed local rationing agencies to offer 75% flour for sick children and adults suffering from digestive difficulties caused by the coarser milling. At first Dienemann argued that these individuals needed no special considerations, because the problem wasn't the flour but the bread. To conserve fuel and labor, the Bundesrat had restricted the operating hours of bakeries.⁸²⁶ These had to let their sourdough rise overnight (longer than usual), baked it in the morning, and seldom let it dry before selling it. The consumption of this heavy, wet bread with its high lactic acid content was the source of their digestive difficulties, he said. Dienemann suggested toasting store-bought bread to dry it out, and that bread baked at home with baking powder instead of a sourdough starter was “quite wholesome” (*recht bekömmlich*).⁸²⁷

⁸²⁵ Dienemann, “Die einheitliche Regelung der Krankenernährung,” 560; *Mitteilungen*, Nr. 2 (June 1917), 4; Nr. 3 (July 1917), 4-6; Nr. 18 (Jan. 1919), 2; Nr. 22 (June 1919), 5. Even after the war ended but as long as rationing continued, eggs were guaranteed only for severe diabetics and those with stomach ulcers: *Mitteilungen*, Nr. 26 (Jan. 1920), 1-2; Nr. 29 (June 1921), 3.

⁸²⁶ Werner, “Kriegsbrot,” *Dresdner Hausfrau* 13, no. 20 (12 Feb. 1915): 1.

⁸²⁷ Dienemann, *Mitteilungen*, Nr. 3 (July 1919), 6-7; *Briefe*, 28-29.

Dienemann commiserated with his colleagues, “It is understandable that the absence of white baked goods for breakfast does not contribute to stimulating the appetite and raising one’s mood, and therefore the doctors are especially frequently and insistently sought out for precisely this food.”⁸²⁸ By the 1910s, Germans preferred wheat bread to rye bread and more refined flour milled to a lower percentage over coarser flour containing more bran. Unenthused or incapacitated by *K-Brot* (*Kreigsbrot*, *Kartoffelbrot*), many patients (and some doctors) in Dresden therefore treated “sick bread” (*Krankenbrot*) as if it were for anyone who felt under the weather. This was false, Dienemann repeated: baked goods made from wheat were reserved for those with intestinal ailments only. And yet, the list of acceptable conditions for receiving this dispensation was long: bleeding from ulcers or cancer, esophageal narrowing, catarrhal jaundice, peritonitis, inflammation of the gall bladder, severe constipation, acute kidney inflammation and, dyspepsia (upset stomach).⁸²⁹ Dienemann constantly reiterated that his colleagues should be firm and decisive in their refusals of undeserving requests, despite—or because—the categories of eligibility had been so liberally defined.

The Physicians Council had eventually agreed to take on the administrative hassle of refined flour and bread—yet another entitlement group. In the fall of 1917, the city had accumulated a limited communal supply of 80% flour (rather than 94%), from which Dresden physicians could write a prescription to undernourished infants under 2 years old and adults with gastrointestinal conditions for up to 3½ pounds over a four-week period.⁸³⁰ When what little wheat the Municipal Association collected the following summer had to be stretched with potato flour, in order to receive a smaller amount of pure wheat baked goods (still ground at 94%),

⁸²⁸ “Es ist begreiflich, daß das Fehlen eines weißen Frühstücksgebäcks zur Erhöhung des Appetites und der Stimmung nicht beiträgt und darum die Ärzte gerade um dieses Nahrungsmittel besonders häufig und dringlich angegangen werden.” Dienemann, *Mitteilungen*, Nr. 26 (Jan. 1920), 2.

⁸²⁹ Dienemann, *Mitteilungen*, Nr. 31 (Oct. 1920), 3; Nr. 35 (July 1921), 2.

⁸³⁰ Dienemann, *Mitteilungen*, Nr. 5 (Oct. 1919), 3.

patients had to give up a larger amount of their general bread coupons: a new mother could get at most 360 g of wheat “sick bread” (*Krankengebäck*) in exchange for 400 g in dark bread (*Schwarzbrot*) coupons per week.⁸³¹ Only in the fall of 1918 could individuals with any diagnosis that caused a sensitive stomach receive rations of wheat flour or bread (at 80%) from specified bakeries and for a limited amount of time.⁸³² By the time wheat products (at 84%) became the norm again in October 1920, weekly rations had increased to 1900 g dark bread, 1425 g white bread, or 1140 g flour, and the sick could get their entire 1425 g ration in “sick bread” (wheat ground to 65%).⁸³³

Just as scarce as refined bread and in as high demand was milk, which Germans valued primarily for its fat. Due to fodder shortages, however, full-fat whole milk was increasingly difficult to find. In the interest of keeping the domestic peace and of persuading them to accept the food situation, Dienemann tried to sell skeptical readers of *A Physician's Letters* on the benefits of pasteurized skim milk, buttermilk, and processed dairy products like Larosan, malted milk, and Soxhlets Nutritional Sugar: these were full of sugar and protein (lactose and casein) and germ free. At one point he touted the benefits of goat's milk, which reportedly had more fat than cow's milk “and is therefore also more nutritious,” while on the next page he encouraged them to consider skimmed cow's milk as just as nutritious as whole milk, only without the fat!⁸³⁴ Dienemann even claimed that “many a baby who does not thrive well on whole milk can be helped with skim milk.”⁸³⁵ He further appealed to the contemporary physical-fitness movement: it was better to raise lean, active youngsters on skim milk than roly-poly children who didn't like

⁸³¹ Dienemann, *Mitteilungen*, Nr. 10 (June 1918), 2.

⁸³² Dienemann, *Mitteilungen*, Nr. 12 (Sept. 1918), 2.

⁸³³ Dienemann, *Mitteilungen*, Nr. 31 (Oct. 1920), 1-2.

⁸³⁴ Dienemann, *Briefe*, 15-17, 22.

⁸³⁵ “Gar manchem Säugling, der bei Vollmilch nicht recht gedeiht, ist mit Magermilch aufzuhelfen.” *Briefe*, 17.

physical exertion.⁸³⁶

Although “milk is the most important food at certain stages of development,”⁸³⁷ it was not a “universal food” for adults. Dienemann tried to dissuade his colleagues from prescribing it for anemia, due to its lack of iron (20). However, short-term “milk cure” rations were acceptable treatment for advanced (decompensated) heart failure, acute nephritis, fevers, and certain cases of poisoning. In a typical attempt to reduce spurious demand but not to exclude the deserving sick, a Saxon Ministry of the Interior order from 2 April 1917 instructed that imprecise diagnoses of “nerves,” “weakness,” and “constitutional illness” did not entitle a patient to whole milk—unless of course his or her condition was really serious. Such prevaricating would be comic if the situation had not been so tragic.

With one hand the Ministry—and, by extension, the Patient Nutrition Division—took away (to preserve the common good), and with the other it gave (out of humanitarian concern). Somewhere between the two poles of extremely strict and extremely lax regulations lay an acceptable amount of government generosity, and it was frequently up to the physicians to negotiate this gray zone. For instance, if there was too little milk available, they could prescribe flour instead, not because those foodstuffs were nutritionally equivalent but because both could be used to prepare soups or gruels that someone with poor digestive capabilities could eat.⁸³⁸ If the patient was unable to work, what was good for the individual competed with what was good for the community. If however the patient could be returned to good working order, then the special rations had been an investment in national well-being rather than a burden. Either way, the telescopic body connected the pregnant, sick, and infirm to the nation, but government

⁸³⁶ Dienemann, *Briefe*, 21.

⁸³⁷ “Daß die Milch für uns in bestimmten Lebenszeiten das wichtigste Nahrungsmittel ist, wirst Du als Vater eines prächtig gedeihenden, wie Du schreibst, Kriegsjungen am besten wissen.” Dienemann, *Briefe*, 14.

⁸³⁸ Dienemann, *Mitteilungen*, Nr. 3 (July 1917), 3-4; Nr. 13 (Oct. 1918); Nr. 18 (Jan. 1919), 6-7.

policies privileged belonging through labor over belonging through formal citizenship, personal identity, or family relation.

The results

The rhetoric of German officials and physicians shaded from confidence early in the war, through acknowledgment of mixed results, to alarm as the conflict ground to a halt but the blockade continued past the armistice. For reasons of both domestic and foreign policy, the government had begun by promising that Germany had or could produce enough food to “hold out” until victory—particularly if the population reduced its consumption.⁸³⁹ As late as March 1917, Dienemann reported in the medical press that Dresden’s death rate actually appeared to have decreased since peacetime. He cited a monthly average mortality of 13.2 per 1000 from January 1912 through July 1914, compared to a monthly average of 12.4 deaths per 1000 persons between August 1914 and December 1916.⁸⁴⁰ “Concerning the future,” he concluded, “experiences up to this point justify the hope that our people (*unser Volk*) will come through these most trying times without appreciable harm to its health.”⁸⁴¹ This was the party line during the war: to defy the British-led Allies and to assuage citizens’ concerns about possible adverse effects of the admitted food shortage.

We can track the change in outlook between the first and second editions of *A Physician’s Letters*. In August 1917, Dienemann admitted that there were some cases of malnutrition, rickets (“the English disease”), and tuberculosis; but he insisted that the health of the general population remained good. For instance, he had it on trustworthy authority from his

⁸³⁹ Paul Eltzbacher, ed. *Die deutsche Volksernährung und der englische Aushungerungsplan* (Braunschweig: Friedrich Vieweg & Sohn, 1914).

⁸⁴⁰ Dienemann, “Ueber die Ernährung der Kranken,” 397. He later reported a rate of 16.2 per 1000 for 1917, which includes the worst of the Turnip Winter (Jan.-March 1917). Dienemann, “Hygienische Kriegsmaßnahmen,” 402.

⁸⁴¹ “Was aber die Zukunft anbelangt, so berechtigen uns die bisherigen Erfahrungen zu der Hoffnung, daß unser Volk durch diese Zeiten schwerster Prüfung ohne nennenswerten Schaden an seiner Gesundheit hindurchgehen wird.” Dienemann, “Ueber die Ernährung der Kranken,” 397.

patients and from other doctors that many so-called “diseases of civilization” had improved on the forced low diet of the war: obesity, gout, heart disease, mild diabetes, appendicitis.⁸⁴² (Infant mortality had fallen with the birthrate, a mixed blessing.⁸⁴³) However, most of his encouragements that *Durchhalten* was possible and without lasting harm were cut from the edition of the book published in mid-1918, and he admitted that “as a result of the English war of starvation, it has never been possible to grant our patients as much as they need.”⁸⁴⁴ Without rationing, they would have given the sick mashed potatoes, egg dishes, gruels, fruit juice, mashed fruit, and dairy products. What had been considered necessary dietary prescriptions had become luxuries.

It is hard to say for sure whether lack of access to sick foods contributed to morbidity and mortality behind the blockade, not least due to the high level of general misery. As noted previously, the Imperial Office of Statistics estimated in 1918 that German adults collectively had lost 20% of their body mass.⁸⁴⁵ Shortages of clothing, shoes, bandages, soap, and disinfectant meant that most people were colder, dirtier, and wetter than they considered healthy.⁸⁴⁶ Certainly rates of tuberculosis, typhus, and other infectious diseases had increased even before the “Spanish influenza” pandemic hit in May 1918.⁸⁴⁷ And there were individual

⁸⁴² Dienemann, *Briefe*, 63; “Herr Dienemann: Mitteilungen aus der Dresdner Lebensmittelversorgung, 1917” under “Vereins- und Kongressberichte. Gesellschaft für Natur- und Heilkunde zu Dresden Sitzung vom 23. März 1918,” *MmW* 65, no. 41 (8 Oct. 1918): 1142-1144, here 1144; Ludolf Krehl, “Die Krankheiten der Kreislauforgane,” in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Aufl., vol. 1, 334-466 (Jena: Gustav Fischer 1922), 374.

⁸⁴³ Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 72-73; Weindling, “The Medical Profession, Social Hygiene and the Birth Rate in Germany, 1914-18,” esp. 422-424; Jay Winter, “Surviving the War: Life Expectation, Illness, and Mortality Rates in Paris, London, and Berlin, 1914-1919,” in *Capital Cities at War: Paris, London, Berlin 1914-1919*, ed. Jay Winter and Jean-Louis Robert, 487-524 (New York: Cambridge University Press, 1997), 498-502.

⁸⁴⁴ “Es ist eben infolge des englischen Aushungerungskrieges nicht einmal möglich, unseren Kranken soviel zuzuweisen, wie sie bedürfen.” Dienemann, *Briefe*, 2. Aufl., 101.

⁸⁴⁵ Erzberger, *Schädigung*, 11, 33.

⁸⁴⁶ Cooper, Letters 13C, 28 Oct. 1917, and 17C, 25 Nov. 1917, *Behind the Lines*, 227, 232; Chickering, *The Great War and Urban Life*, 277-280.

⁸⁴⁷ Landesgesundheitsamt Sachsen, *Dritter Jahresbericht*, 76-117, for influenza 100-102; Erzberger, *Schädigung*, 11-41; Wolfgang U. Eckart, “Die Vision vom ‘gesunden Volkskörper’: Seuchenprophylaxe, Sozial- und Rassenhygiene in Deutschland zwischen Kaiserreich und Nationalsozialismus,” in *Hauptsache Gesund!*, ed. Susanne Roessinger and Heidrun Merk, 34-47 (Marburg: Jonas, 1998), esp. 36-38; Winter, “Surviving the War.”

cases, like the ones Ragnar Berg complained about, in which sick rations could not be obtained at the levels desired.

With the end of the war and of the Empire, but not of the naval blockade, government officials and medical observers had no qualms about telling their constituents—and foreign parties—the whole truth and then some about the damage wrought on Germans’ individual and collective health.⁸⁴⁸ Of course, many of these protestations of victimhood were as calculated as previous ones of obfuscation and bravado. Whereas many German physicians had submitted to (self) censorship in public venues during the war, as early as December 1918 some began circulating dire numbers from the Imperial Office of Statistics: 762,796 more German civilians had died from July 1914 through June 1918 than projected by pre-war demographic trends.⁸⁴⁹ The medical men attributed these deaths not to their own inability to organize sick rations or to diagnose and treat patients but to the food shortage caused by the blockade. In subsequent iterations, this number was sometimes rounded up to 800,000 excess deaths of “war victims” (*Kriegsopfer*): “When Rubner alludes to this [number], he refers namely to tuberculosis, and it is obvious that the deterioration of the general state of health and the decline in the resistance of the *Volkskörper* are best seen from a consideration of tuberculosis morbidity.”⁸⁵⁰ With the world watching—and some of it offering humanitarian aid—official optimism about holding out gave way to official pessimism about rising rates of rickets, anemia, amenorrhea, and mortality.⁸⁵¹

⁸⁴⁸ E.g. Alexander Elster, “Chronik der Sozialen Hygiene,” *Öffentliche Gesundheitspflege* 51, no. 4 ([April] 1919): 135; Max Georg Beninde and Max Rubner, *Hungerblockade und Volksgesundheit* (Berlin: Schoetz, 1920).

⁸⁴⁹ Hamel, “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919), 4-6, here 5; Matthias Erzberger, *Schädigung der Deutschen Volkskraft durch die feindliche Blockade. Denkschrift des Reichsgesundheitsamtes, Dezember 1918* (Oldenburg i. Gr.: Gerhard Stalling, 1919), 15; Vincent, *The Politics of Hunger*, 141. This number does not include 209,000 deaths from “Spanish influenza.” Huegel, *Kriegsernährungswirtschaft Deutschlands*, 543.

⁸⁵⁰ “Rubner weist dabei namentlich auf die Tuberkulose hin, und es liegt auf der Hand, daß sich die Verschlechterung des allgemeinen Gesundheitszustandes und die Herabsetzung der Widerstandsfähigkeit des Volkskörpers am besten aus einer Betrachtung der Tuberkulose-morbidität ersehen läßt.” Elster, “Chronik der Sozialen Hygiene,” 138. See also Erzberger, *Schädigung*, 53.

⁸⁵¹ Margarete Starrmann-Hunger, *Sachsen: Untersuchungen über die wirtschaftlichen, sozialen und gesundheit-*

After the war, the Universum Film Corporation (UFA) gathered visual evidence of the toll the blockade had taken on Germans' individual and collective bodies in a documentary entitled *The Effect of the Hunger Blockade on the Health of the People* (1921).⁸⁵² The filmmakers parade emaciated old men in front of the camera and present “before” and “after” shots of fat burghers: before the war, filling out a bathing suit; after the war, with rolls of empty skin. Skinny young men totter down stairs on painful joints, while short children with bowed legs cry next to healthy children without rickets. Not all Germans had been so badly affected, but for those who had hungered, the physical changes could be profound. Finally, the film constituted the social body, first by graphing excess tuberculosis morbidity and civilian mortality with tombstones, and second by closing with a crowd of ghostly children representing the future lost generation.⁸⁵³

One condition that seems genuinely to have taken the medical community by surprise, beginning in the winter of 1916-1917, is what they called “hunger edema” (*Hungerödem*) or “hunger dropsy” (*Hungerwassersucht*).⁸⁵⁴ The typical patient with the “edema sickness” (*Oedemkrankheit*) was a hard-working man aged forty to sixty years old with a daily intake of

lichen Zustände der Bevölkerung (Dresden: Teubner, 1924). The most famous example of aid is the “Quaker Feeding” (*Quäkerspeisung*) organized by Herbert Hoover and American and British Friends organizations. See Achim von Borries, *Quiet Helpers: Quaker Service in Postwar Germany*, ed. Peter Daniels, trans. John Cary, Cathy Cary, and Hildegard Wright (London: Quaker Home Service and the American Friends Service Committee, 2000).

⁸⁵² Hans Cürlis, Nicholas Haufmann, Georg Reimann, E. Rosenthal, and Curt Thomalla, *Die Wirkung der Hungerblockade auf die Volksgesundheit* (Berlin: UFA Kulturabteilung, 1921), 53 mins., Nr. 18792, Bundesfilmarchiv, Berlin.

⁸⁵³ Sybilla Nikolow has tracked these kinds of visual representations into the Weimar Period: “Imaginäre Gemeinschaften: Statistische Bilder der Bevölkerung,” in *Konstruierte Sichtbarkeiten: Wissenschafts- und Technikbilder seit der Frühen Neuzeit*, ed. Martina Heßler, 263-278 (München: Wilhelm Fink, 2006) ; and *ibid.*, “Die Nation als statistisches Kollektiv: Bevölkerungskonstruktionen im Kaiserreich und in der Weimarer Republik,” in *Wissenschaft und Nation in der europäischen Geschichte*, ed. Ralph Jessen and Jakob Vogel, 235-259 (New York: Campus Verlag, 2002).

⁸⁵⁴ Kurt Hach, “Zur Frage der Ernährungsschädigung und der Hungerkrankheit,” *DmW* Nr. 36 (5 Sept. 1918): 996-997; Friedrich Kraus, “Die Folgen der Hungerblockade und der jetzt noch vorhandenen schlechten Ernährung großer Teile des Volkes,” in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Auflage, vol. 2, 232-236 (Jena: Gustav Fischer 1922). See also Arnulf Huegel, *Kriegsernährungswirtschaft Deutschlands*, 526-531; Faulstich, *Hungersterben in der Psychiatrie*, 48-55.

800-1300 calories, not more than fifty grams of protein, and at least fifteen percent indigestible cellulose (from whole-grain bread, root vegetables, and leafy greens). Characterized by slow speech and shuffling gait, dry skin and bruising, hypothermia and hyporeflexia, and “doughy” accumulations of fluid in the face, abdomen, and extremities, this condition was variously attributed to fat malnutrition, spoiled carbohydrate-based foods, too much water, too few vitamins, and auto-intoxication from either soluble protein breakdown products or from metabolic concretions (*Stoffwechselschlacken*) from the catabolism of a starving body consuming its own tissue to survive. Recommended therapies ranged from merely eating more fat to a comprehensive approach of complete bed rest in a warm room with hot baths and an improved diet high in protein, fat, and calcium but low in water and salt (NaCl). Physicians tried prescribing thyroid extract (to speed up metabolism), epinephrine (to increase energy), and diuretics (to off-load the accumulated fluid). Because low-level malnutrition in much of Europe’s population had resolved by the late nineteenth century, even among the institutionalized, this “prison edema” was relatively unknown to Western Europeans before World War I.⁸⁵⁵

This failure of the vaunted German agriculture and bureaucracy was punctuated by the disaster that occurred in prisons and especially long-term care institutions, where “the healthy suffered hardly any less hunger than the sickly ones and patients.”⁸⁵⁶ Saxony was acutely affected, as its unusually large number of clinics and sanatoria further drew down a public food supply strained by its imbalance of industrial to agricultural areas.⁸⁵⁷ Georg Ilberg (1862-1942),

⁸⁵⁵ Dienemann, *Briefe*, 77-78. “Dropsy” (*Wassersucht*) tended to appear with scurvy and/or night blindness, but had essentially disappeared from prisons in the 1870s; malnutrition remained a problem. Thoms, *Anstaltskost*, 795-796.

⁸⁵⁶ “Hier haben die Gesunden kaum weniger gelitten unter dem Hunger als die Kränklichen und Kranken.” Friedrich Kraus, “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 3. Rubner declared that warning signs appeared as early as 1916, but physicians could not publicize these findings because of government censorship; and besides, who would have believed that the situation was so bad? Max Rubner, “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 2. Nevertheless, French physicians read with interest the hints that traveled in the medical press: Michl, *Im Dienste des “Volkskörpers”*, 92-93.

⁸⁵⁷ Dr. Kraft finally refused to accept any diabetics at Lahmann’s Sanatorium at Weisser Hirsch on account of the

the chief physician at the Sonnenstein Asylum outside Pirna, calculated that 7,480 more patients had died in Saxon psychiatric institutions than expected—and that did not include the mentally ill, intellectually disabled, and epileptic patients housed in smaller hospitals or living at home who did not receive enough to eat, became ill, and died.⁸⁵⁸ Particularly those with tics, seizures, or outbursts needed more calories than the others, but it was not possible to provide them, and even patients with close family connections had succumbed. “At least our enemies cannot claim the murder of so many defenseless persons through the blockade as a heroic feat!” he declared.⁸⁵⁹

The fault lay somewhere between the inability of many institutions to raise their own food, the powerlessness of inmates to benefit from the black market, and insufficient special rations for a group of individuals who clearly were not contributing to the war effort. What began as unconscious disorganization proceeded into conscious selection that continued under a eugenic mindset for the next two decades. The most infamous example of this souring of medical humanitarianism in favor of raw utilitarianism is Karl Binding and Alfred Hoche’s provocative treatise defending euthanasia, *Allowing the Destruction of Life Unworthy of Life* (1920).⁸⁶⁰ Binding had been a law professor at the University of Leipzig from 1872 to 1912, while Hoche was a psychiatrist in Freiburg im Breisgau, where Binding retired shortly before World War I began. The idea that there were valid legal and socio-biological reasons that some persons should be shuffled off this mortal coil was one of the most influential arguments used in the

large amounts of butter, meat, milk, and semolina that they required; many would have come from other ration districts. Page 9, Protokoll über die 5. Sitzung des Ernährungsbeirates vom 22. Juni 1916, doc. 58-66, Nr. 23189 Prokotonle Bd. 1, 10736 Mdl, SHAD.

⁸⁵⁸ Georg Ilberg, “Die Sterblichkeit der Geisteskranken in den sächsischen Anstalten während des Krieges,” *Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medizin* 78, no. 1/2 (1922): 58-63; Günter Heidel and Marina Lienert, “Georg Ilberg (1862-1942): Leben und ärztlich-humanistisches Vermächtnis,” *Psychiatrie, Neurologie, und medizinische Psychologie* (Leipzig) 41, no. 11 (Nov. 1989): 651-659.

⁸⁵⁹ “Jedenfalls dürfen sich unsere Feinde die Abtötung so vieler wehrloser Menschen durch die Blockade nicht als Heldentat anrechnen!” Ilberg, “Sterblichkeit,” 63.

⁸⁶⁰ Karl Binding and Alfred Hoche, *Die Freigabe der Vernichtung Lebensunwerten Lebens, ihr Mass und ihre Form* (Leipzig: Felix Meiner, 1920); on historical precedents and the debate that ensued, Karl Heinz Hafner and Rolf Winau, “‘Die Freigabe der Vernichtung lebensunwerten Lebens.’ Eine Untersuchung zu der Schrift van Karl Binding und Alfred Hache,” *Medizin-historisches Journal* 9, no. 3/4 (1974): 227-254.

development of the policies of negative eugenics the National Socialist state enacted less than two decades later. Proposals to legalize suicide encourage or even legislate the killing of the terminally ill or “mentally dead” went back at least to the 1890s. But this strain of thought remained marginal until 70,000 German psychiatric inmates died directly or indirectly of hunger during and after World War I.⁸⁶¹ Then “rational,” economic arguments seemed to corroborate the earlier biological ones.⁸⁶²

In so far as the extremes of weight loss, lack of energy for physical exertion, and outright starvation were concerned, experiences of rationing confirmed standard nutritional science.⁸⁶³ Bodies required so many calories for basic functions (basal metabolism); more for movement and periods of growth, pregnancy, and convalescence; less for smaller, younger, and older bodies. Even Dienemann admitted in *A Physician's Letters* that official rations necessitated recourse to the black market because they were quantitatively insufficient even before considering losses to spoilage and kitchen waste.⁸⁶⁴ What was debated was whether rations had been qualitatively sound—for anyone. In 1917 economist Hans Krüger at the City Food Office in Dresden had noted that the military's task of feeding its largely homogeneous population of healthy young men was easier than the civilian authorities' responsibility to feed a varied population of men, women, old, young, sick, and well.⁸⁶⁵ After the war, some medical experts, like Drs. Friedrich Kraus (1858-1934) and Rudolf Abel (1868-1942), charged that “the standard

⁸⁶¹ Heinz Faulstich, *Hungersterben in der Psychiatrie*, 59-68; Huegel, *Kriegsernährungswirtschaft Deutschlands*, 548-552.

⁸⁶² Paul Weindling, *Health, Race, and German Politics between National Unification and Nazism, 1870-1945* (Cambridge: Cambridge University Press, 1989), 393-398; Robert Proctor, *Racial Hygiene: Medicine under the Nazis* (Cambridge, MA: Harvard University Press, 1988), 177-182.

⁸⁶³ E.g. Adolf Loewy, “Über Kriegskost. Nach statistischen Erhebungen,” *DmW* 43:1, no. 6 (8 Feb. 1917): 161-165 and no. 7 (15 Feb. 1917): 194-198; Friedrich Kraus, “Störungen des Stoffwechsels,” in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Aufl., vol. 2, 164-238 (Jena: Gustav Fischer, 1922), 166.

⁸⁶⁴ Dienemann, *Briefe*, 74.

⁸⁶⁵ Hans Krüger, “Die Massenspeisung,” in *Beiträge zur Kriegswirtschaft*, ed. Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 1-31 (Berlin: Reimar Hobbing, mid May 1917), 9-10.

man” was a scientific fallacy, because it applied “mechanical” controls to biologically diverse bodies, producing hunger edema among other pathologies.⁸⁶⁶ Perceptive observers even noted that Germans hungered differently: for some the decrease in calories affected their weight most, for others it was the decrease in meat or in fat, or a particular combination of these factors.⁸⁶⁷

By design the scaling (*Staffelung*) of both sick and general rations recognized some but by no means all possible physiological differences. Allotments were adjusted for age, paid occupation, and overall health status. Eventually there were special rations in Dresden for 6-8 age groups from birth to death; at least 3 categories of “hard workers”; women in the last two trimesters of pregnancy, after childbirth, and while breastfeeding; 3-6 stages of tuberculosis; and numerous diagnosable conditions from stomach ulcers to post-operative recovery. The poor (*Minderbemittelte*) received some discounts, while families raising crops and animals (*Selbstversorger*) collected fewer rations. Missing from the bureaucrats’ calculations were height and weight, which would have allowed for more individualized rations calculated by Rubner’s body-surface area law. Also missing was sex. The “standard” adult female body supposedly required 76% of the calories of a 70-kilogram man doing average work over an 8-hour day. This assumption was heavily classed, as any woman not wealthy enough to have servants performed significant household labor; and working-class women frequently fulfilled a “double shift” of paid employment in or out of the house in addition to domestic duties.⁸⁶⁸ In addition, the planned economy meant that daily food shopping became that much more cumbersome, and until Saxony reduced food queues, it involved standing in long lines in all manner of weather. So while many

⁸⁶⁶ Friedrich Kraus, “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 3; Friedrich Kraus, “Störungen des Stoffwechsels,” in *Lehrbuch der inneren Medizin*, ed. Ludolf Krehl, 14. Aufl., vol. 2, 164-238 (Jena: Gustav Fischer, 1922), 233; Rudolf Abel, from a talk before the Medizinische Gesellschaft (Jena, 28 May 1919), summarized as “Die Ernährungsverhältnisse in Deutschland vor, in und nach dem Kriege,” *DmW* 45, no. 48 (27 Nov. 1919): 1342.

⁸⁶⁷ Franz Schacht, “Die physiologischen Lehren der jetzigen Volksernährung,” *Zeitschrift für physikalische und diätetische Therapie* 21, no. 10 (1917): 296-306, here 306.

⁸⁶⁸ Children’s labor was similarly classed. Physiologist Adolf Loewy (1862-1937) suggested counting persons under the age of 11 as “children” and those older as “adults.” Loewy, “Über Kriegskosten,” 165.

women were better off on their rations than their male counterparts, it was unrealistic to suppose that they automatically needed less sustenance based merely on their sex.

One group that aroused particular attention for its absence from the rationing tables was the country's intellectual workers (*Geistesarbeiter*). As Dr. Max Georg Beninde (1884-1949) asserted after the war, "According to general opinion, the mental workers have suffered much worse than the hand-working people, especially the civil service"; and district physicians reported more and more of them were seeking approval for convalescent vacations.⁸⁶⁹ These white-collar workers complained that the science on which the planned food economy was based did not sufficiently recognize *their* exertions. For instance, in March 1917 elected representatives to the Saxon Nutrition Advisory Council discussed the "pressing necessity" of granting special rations to civil-service employees and whether the public would stand for it—to no avail.⁸⁷⁰ Dienemann reflected this debate in *A Physician's Letters*, when he "replied" to his reader's surprised concern that "your mental activity is valued so little when considering nutritional need. That's just the way it is: even the most strenuous mental activity induces no recognizable increase in nutritional need."⁸⁷¹ According to the Munich School of Metabolism paradigm, the reader's "exhaustion" (*Ermüdung*) was just an individualized response to work and not a general law that needed to be taken into account by physiologists and the bureaucrats in charge of rations.

⁸⁶⁹ "Nach allgemeinem Urteil haben die Geistesarbeiter wesentlich schwerer gelitten als die handarbeitende Bevölkerung, ganz besonders der Beamtenstand." Beninde, "[Vortrag]," *BkW* 56, no. 1 (Jan. 1919): 8.

⁸⁷⁰ Abgeordneter Oskar Heinrich Günther (1861-1945) from Plauen and Amtshauptmann Graf von Holtzendorff, pp. 2-4, doc. 134-149, Niederschrift über die 19. Sitzung des Ernährungsbeirats vom 8. März 1917, Nr. 23190 Protokolle Bd. 2, 10736 Mdl, SHAD. On the Reichs level, Huegel, *Kriegsernährungswirtschaft Deutschlands*, 598-590.

⁸⁷¹ "Dich wundert, daß die Muskelarbeit so gut bedacht ist, und Deine geistige Tätigkeit so gering in Bezug auf Nahrungsbedarf eingeschätzt wird. Es ist aber nicht anders, selbst die anstrengendste geistige Tätigkeit bedingt keine erkennbare Erhöhung des Nahrungsbedarfs." Dienemann, *Briefe*, 61. There is a long history of mental work and a rich diet being considered antithetical to each other: Steven Shapin, "The Philosopher and the Chicken: On the Dietetics of Disembodied Knowledge," in *Science Incarnate: Historical Embodiments of Natural Knowledge*, ed. Christopher Lawrence and Steven Shapin, 21-50 (Chicago: University of Chicago Press, 1998).

Admittedly these complaints about physiological requirements were confounded by economic factors. Not only did white-collar workers like bureaucrats and clerks not qualify for extra food rations the way many blue-collar laborers did, but their fixed salaries were no match for rising prices. Having learned a lesson about nutritional physiology from the rations hierarchy, therefore, the 600,000-member-strong Union of Retail Organizations (*Arbeitsgemeinschaft der Kaufmännischen Verbände*) petitioned the Saxon and Prussia parliaments in 1918 either to eliminate “hard-working” supplements and increase general rations, or to grant extra rations to every “hard-working” person putting in 8-9 hour shifts.⁸⁷² (“Hardest-working” supplements could continue as long as all persons working under similarly taxing conditions were eligible, regardless of their employer.) In the first edition of *Letters from a Physician*, Dienemann agreed that “the simplest solution to the whole problem of supplements would be a sufficient per-capita mean calorie total for the entire population”; by the second edition the food situation had deteriorated so badly that he could not keep up the farce of “holding out” and cut most of that section from the book.⁸⁷³

Conclusion

As it was, after the hard(est)-working programs closed at the end of 1918, all individuals in Dresden over the age of eight received the same general ration, which gradually rose until the end of the program in September 1921.⁸⁷⁴ Public control of the food market that had begun in January-February 1915 rolled back in stages between October 1920 and September 1921.⁸⁷⁵ In March 1921, only milk, butter, and eggs were still rationed; by June 1921, only milk, semolina,

⁸⁷² As reported in Elster, “Chronik der Sozialen Hygiene,” 140-141.

⁸⁷³ “Die einfachste Lösung der ganzen Frage der Sonderzulagen wäre also: eine genügende Kopf-Durchschnitts-Calorienmenge für die Gesamtbevölkerung.” Dienemann, *Briefe*, 88.

⁸⁷⁴ “Übersicht über die den Dresdnern zustehenden Nahrungsmittelmengen,” *Mitteilungen*, Nr. 18 (Jan. 1919), 9; “Über die den Dresdner Einwohnern zustehenden Nahrungsmittelmengen,” *Mitteilungen*, Nr. 26 (Jan. 1920), 6.

⁸⁷⁵ Dienemann, *Mitteilungen*, Nrs. 31-36 (Nov. 1920-July 1921) and notices dated 13 Aug., 18 Aug., and Sept. 1921.

baked goods, and maybe sugar were still obtainable as supplements.⁸⁷⁶ The Dresden Patient Nutrition Division disbanded as of 15 August 1921, although prescriptions for sick bread and semolina were valid until 24 September, and milk could still be prescribed beyond that date.⁸⁷⁷ All other patients had to fend for themselves on the free market.

The preceding analysis has shown that the collective experience of negotiating the “good enough” diet Dienemann described in *A Physician’s Letters* broadened the population’s familiarity with the continuum of scientific knowledge about nutrition, especially the calorie paradigm by which rations were measured. Once the local, state, or imperial governments decided to act on the food question to quell domestic unrest and to reduce the risk of triggering a resurgence of epidemic tuberculosis, they looked to nutritionists and physiologists as well as economists and agriculturalists for expert advice to shape their policies. Very few Germans (except maybe frontline soldiers) could have failed to notice the quantitative, calorimetric science that public officials used to determine their nutritional needs, often knowing nothing more about them than their age and occupation. The intimate act of preparing and eating food had not only been made public but had been quantified on both the individual level and a mass scale.

In retrospect, World War I rationing was a triumph neither of the vaunted German bureaucracy nor of nutritional science.⁸⁷⁸ But it was a major step toward the collectivist thinking that, by the late 1920s, increasingly informed public discussions of what it meant to be German and to belong to the German nation. That the adoption of collectivism was not immediate and on command is evidenced by the difficulty Dienemann had in getting his colleagues to prescribe not (just) for the good of their individual patients but according to the rules that had been designed

⁸⁷⁶ Dienemann, *Mitteilungen*, Nr. 33 (March 1921), 1; Nr. 34 (June 1921), 1.

⁸⁷⁷ Typed note entitled “Krankenernährung” and dated Dresden, 13 August 1921; filed with *Mitteilungen*, 17.2.1, Stadtarchiv Dresden.

⁸⁷⁸ Corinna Treitel, “Max Rubner and the Biopolitics of Rational Nutrition,” *CEH* 41 (2008): 1-25.

with the collective good in mind. They were still consciously or unconsciously working under a different mindset, one that put the individual patient and her altered physiology above everything else. That this shift toward collectivism was not universal is evidenced by how much competition over food and other scarce resources divided the nation: families from neighbors, citizens from public officials, consumers from shopkeepers and “profiteers,” civilian hospital patients from military ones, and especially farmers from city dwellers.

Nevertheless, the war brought Germans closer together physically. In the nationalist fervor of the crowds that thronged the streets during the August Days of 1914; in the millions of men who volunteered to fight for “God, emperor, and fatherland”; and in the millions of women and children who danced in the “polonaises” to keep themselves warm while waiting in the hope to purchase food, collective levels of the telescopic body were being constituted. Wartime rationing enumerated and systematized individual bodies, tastes, and capabilities. In addition to encouraging them to think of themselves as bodies that did or did not labor, that expended X-number of calories, and that ate so-and-so many grams of fat, it articulated them as parts of a telescopic body that extended from the macromolecular level up to the collective. Germans began to think of themselves and not the Kaiser as the embodiment of the nation, *das Volk*. It was *their* bodily survival and the health of the next generation of *their* children that determined the continuation of the German nation, not his.

Physicians were among the first to use the metaphor of the *Volkskörper* to describe the condition of the German people after the war.⁸⁷⁹ In December 1918, Dr. Johannes Orth (1847-1923) opened a meeting of the *Vereinigten ärztlichen Gesellschaft* in Berlin by analogizing from the gathered doctors’ individual practices to their collective responsibility for the nation: “the

⁸⁷⁹ Michl, *Im Dienste des “Volkskörpers”*. Although Michl writes as if this concern began with the war, the terminology her sources used was confined to “Volksernährung” and “Volkskraft” at that point. Pp. 54, 82-110.

medical profession has historically laid the greatest value not only on curing sick persons or providing them relief but also observing the physical welfare of the whole *Volk*, to watch over it in order to protect *das Volk* from damage to its health.”⁸⁸⁰ Other speakers at this conference, which was publicized on both sides of the Atlantic Ocean,⁸⁸¹ continued the theme of the aggregated health of the people: Max Rubner spoke of the protein-rich diet necessary for the “regeneration of the tremendous loss to our *Volkskörper*”⁸⁸²; Friedrich Kraus of the limited rations having exercised “a grave influence on the strength of the people and ... on the whole health of the people”⁸⁸³; and Privy Councilor Dr. Carl Hamel (1870-1949) on “the impacts of years of deprivation on the *Volkskörper* as a whole” and on physicians’ “holy duty” “as the appointed guardians of the health of the people.”⁸⁸⁴ Finally, Emanuel Wurm (1857-1920), Secretary of State for the Imperial Food Office, closed the conference by thanking the physicians who “stand at the sick bed of the nation.”⁸⁸⁵

The rhetoric of the *Volkskörper* could be applied to cross purposes, depending on one’s politics. On the one hand, parties who wanted the blockade ended described the collective body as sick. British journalist Henry Noel Brailsford (1873-1958) picked up on the leitmotif when he

⁸⁸⁰ Orth: “der Aertzestand von jeher grössten Wert darauf gelegt hat, nicht nur kranke Menschen zu heilen oder ihnen Linderung zu schaffen, sondern auch das körperliche Wohl des ganzen Volkes zu beachten, über es zu wachen, um das Volk vor gesundheitlichen Schädigungen zu bewahren.” “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 1.

⁸⁸¹ Max Rubner, *et al.*, *The Starving of Germany. Papers Read at Extraordinary Meeting of United Medical Societies Held at Headquarters of Berlin Medical Society, Berlin, December 18th 1918* (Berlin: L. Schumacher, 1919). For whatever reason, Orth’s comments were not included.

⁸⁸² Rubner: “Wiederaufbau des ungeheuren Verlustes unseres Volkskörper.” “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 3.

⁸⁸³ Kraus: “einen schwerwiegenden Einfluss auf die Volkskraft und ... auf die ganze Volksgesundheit.” “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 3.

⁸⁸⁴ “Damit erwächst aber uns Aerzten, als den berufenen Hütern der Volksgesundheit, die heilige Pflicht, dass wir uns schirmend vor unser erschöpftes und von Hungersnot bedrängtes Volkes hinstellen.” and “Meine Aufgabe wird es nun sein, die Wirkungen dieser jahrelangen Einschränkungen auf den Volkskörper als Ganzes Ihnen an einigen Zahlenbeispielen zu veranschaulichen.” Hamel, “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 5, 4.

⁸⁸⁵ Wurm: “Sie am Krankenbett der Nation stehen.” “[Vortrag],” *BkW* 56, no. 1 (Jan. 1919): 9. Wurm, a Jewish chemist and journalist who had founded and led the Konsumverein *Vorwärts* in Dresden (1888-1890), presided over the successor to the KEA, the Reichsernährungsamt, from 14 Nov. 1918 until it was absorbed into the Reichsernährungsministerium on 13 Feb. 1919. Between 1890 and 1918 he had frequently been a Reichstag representative from the small kingdom of Reuß jüngerer Linie, which joined Thüringen after the revolution.

toured the war-ravaged country:

A doctor would prescribe a rest-cure, with abundant and stimulating food, for the whole nation. It is not merely half-starved: it is in a state of nervous ill-health that varies according to temperament from dull apathy to neurotic overexcitement. No one is surprised to hear of the physical consequences of nearly five years' progressive under-feeding.⁸⁸⁶

While Brailsford—a socialist, pacifist, and feminist—claimed “the average man and woman in the streets is visibly listless and anemic,” another British observer wrote, “There are very few fat people in Berlin today, but equally there is no obvious expression of hunger and exhaustion on the faces of the people.”⁸⁸⁷ On the other hand, the collective body might be so strong that it could not be killed. Upon signing the Versailles Treaty in June 1919, Catholic Center politician Matthias Erzberger (1875-1921) warned the agreement would cause “anarchy and famine” but declared, “A people of 70 millions suffers but does not die.”⁸⁸⁸ By virtue of the sheer number of Germans in the Reich, he promised, Germany would continue to exist. Even shorn of 7 million citizens in Alsace-Lorraine, Northern Schleswig, and the new Poland, and 3 million military and civilian casualties, the German Reich had an undeniable physical presence in Central Europe.⁸⁸⁹

In truth, the effect of the blockade and therefore the countervailing effect of the special rations program depended on the individual's financial resources, access to food resources, and initial state of health. Some bodies, such as healthy or overweight ones, weathered the food

⁸⁸⁶ Henry Noel Brailsford (1873-1958), “An Impression of Germany,” *Across the Blockade: A Record of Travels in Enemy Europe* (New York: Harcourt, Brace & Howe, 1919), 122. American lawyer and pacifist Madeleine Zabriskie Doty (1877-1963), who traveled around war-torn Europe, agreed: “The [German] nation is dying.” *Short Rations: An American Woman in Germany, 1915...1916* (New York: The Century Co., 1917), 241.

⁸⁸⁷ Cambridge economist C.W. Guillebaud in early May 1919, as quoted on p. 381 in Keith R. Allen, “Sharing Scarcity: Bread Rationing and the First World War in Berlin, 1914-1923,” *Journal of Social History* 32, no. 2 (Winter 1998): 371-393.

⁸⁸⁸ “Ein Volk von 70 Millionen leidet, aber es stirbt nicht.” “Declaration by German Plenipotentiaries on signing Armistice, November 11, 1918,” in *International Law Documents. Neutrality, Conduct and Conclusion of Hostilities with Notes. 1918*, ed. US Naval War College, International Law Studies Series vol. 58, 73-74 (Washington, DC: Government Printing Office, 1919): 74. See also Erzberger's memoir, *Erlebnisse im Weltkrieg* (Stuttgart: Deutsche Verlagsanstalt, 1920).

⁸⁸⁹ Detlev J. K. Peukert, *The Weimar Republic: The Crisis of Classical Modernity*, trans. Richard Deveson (New York: Hill and Wang, 1989), 7-9.

shortage comparatively well. Those with metabolic conditions like gout or mild to moderate diabetes mellitus actually functioned better. Others, such as those infected with *Mycobacterium tuberculosis*, or ones with severe diabetes or sensitive digestive tracts, had their underlying conditions exacerbated by the war diet. Some Germans had survived the blockade, rationing, and hunger better and others worse, but it was much easier to omit the nuances and describe the whole country as a hungry, emaciated, disease-ravaged entity that deserved sympathy—and a resumption of foreign trade. It was cruelly ironic that the very sick persons who had been marginalized by their own countrymen’s planned food economy in favor of hale and laboring individuals were elevated to represent the nation as innocent victims of Allied inhumanity.

The hypothetical moral question of whether some individuals should not be allowed to continue living—or whether they should be forced to choose to die or be killed—became a practical legal and social question with the advent of a food economy run and funded (even in part) by the government. When not just the money to subsidize the care of the sick came from the communal budget that had to meet expenses for many different constituencies, but the very food that fed them was taken off the tables of healthy Germans and out of the mouths of their children, then the continued subsistence of the sick and disabled became a collective concern. Historian Klaus Dörner explained “All these factors contributed to the trend that medicine became incapable of differentiating between state and society, and instead tended to favor the state or ‘people’s body’ over the individual.”⁸⁹⁰

The failure of the centralized food system during World War I taught Germans to selectively attend to the suffering of the most vulnerable members of their nation. It was a small rhetorical and then mental shift from “we must feed those who work in the war effort to ensure

⁸⁹⁰ “All diese Faktoren bergen zweifellos die Tendenz in sich, daß die Medizin unfähig wurde, zwischen Staat und Gesellschaft zu differenzieren, und statt dessen neigte, vom individuellen auf den Staats- bzw. ‘Volkkörper’ zu schließen.” As quoted in Hafner and Winau, “‘Die Freigabe der Vernichtung lebensunwerten Lebens,’” 245n129.

victory” to “we will not feed those who do not contribute.” In fact, General Paul von Hindenburg said as much when he misquoted a Bible verse in his leaked memo to Chancellor Theobald Bethmann-Hollweg (1856–1921): “Whoever does not work shall not eat,” thereby omitting those who could not work—the young, the old, the infirm, and their caregivers—as well as those whose work was viewed as less critical to winning the war.⁸⁹¹ The goal-directed, hierarchical philosophy of World War I based (largely) on what individuals did (i.e. contributed to the war effort) became the racialized scale for rations in World War II based on who individuals were (Aryan, Slavic, Jewish, etc.). The issues of economic parity, physiological difference, and especially humanitarianism fell by the wayside as those of collective good and productive labor became paramount for the strengthening and victory of the people’s community.

⁸⁹¹ Private memo to Chancellor Bethmann-Hollweg, 13 Sept. 1916, as quoted in Davis, *Home Fires Burning*, 179. Standard English translations of 2 Thessalonians 3:10 read something like “Whoever does not want to work should not eat.” From the four most common versions in Germany in 1916: Elberfelder 1905/[1871]: “Denn auch als wir bei euch waren, geboten wir euch dieses: Wenn jemand nicht arbeiten will, so soll er auch nicht essen.”; and Luther 1912/1545: “Und da wir bei euch waren, geboten wir euch solches, daß, so jemand nicht will arbeiten, der soll auch nicht essen.” German versions accessed 31 March 2012, <http://ebible.com>.

Conclusion: Nutritional Knowledge and Power in the Third Reich

Leipziger Allerlei in One Pot

Although the necessary vegetables are not as young and tender as in the early summer, they lend themselves especially well to being cooked in meat broth. A half pound of beef and a couple good soup bones together with leek and celery roots makes a good stock [consommé]. Simmer to draw out the flavor, then strain. The vegetables provided by the winter market: carrots, kohlrabi, cauliflower, green [peas] (conserved) or dried peas (cheaper, but have to be soaked the evening before) are cleaned, added to the meat broth, and cooked until soft. About half an hour before serving, lay on top potatoes that have been peeled and quartered or cut into even smaller pieces, salt them lightly, and let them cook. Then everything is carefully mixed. The meat that has cooled while the vegetables cooked should be removed from all the bones, minced or put through a grinder, and stirred into the finished dish. Salt to taste.⁸⁹²

Your body belongs to the nation!
Your body belongs to the Führer!
You have the duty to be healthy!
Food is not a private matter!⁸⁹³

⁸⁹² “Leipziger Allerlei in einem Topf: Wenn die dazu benötigten Gemüse nicht mehr so jung und zart wie im Frühsommer sind, eignen sie sich besonders gut dazu, in Fleischbrühe gekocht zu werden. Ein halbes Pfund Rindfleisch und ein paar gute Suppenknochen dazu geben zusammen mit Porreezwiebel und Selleriewurzel eine gute Kraftbrühe. Alles gut ausgekocht, durchgegossen. Das gut zugeputzte Gemüse, je nachdem es der winterliche Markt bringt: Möhren, Kohlrabi, Blumenkohl, grüne (Konserven) oder getrocknete Erbsen (billiger, jedoch am Abend vorher einweichen), werden in die kochende Fleischbrühe getan und weichgekocht. Etwa eine halbe Stunde vor dem Anrichten legt man die geschälten und in Viertel oder noch kleinere Stücke geschnittenen Kartoffeln oben auf, salzt sie nochmals leicht und läßt sie garkochen. Dann wird alles vorsichtig gemischt. Das während der Kochdauer des Gemüses kaltgewordene Fleisch oder Suppenfleisch löst man gut von allen Knochen, wiegt es fein oder passiert es durch die Maschine und rührt es mit an das fertige, nochmals mit Salz abgeschmeckte Gericht. Preis: Fleisch (oder Suppenfleisch mit Knochen) 70 Pfg., Gemüse 50 Pfg., Erbsen getrocknet 25 Pfg. Kartoffeln 20 Pfg., Gewürze und Salz 10 Pfg., zusammen: 1.75 Mark.” “Heimatlich Eintopfgerichte für vier bis fünf Personen,” *Leipziger Hausfrau* 32, no. 5 (2 Nov. 1933): IV. Leipziger Allerlei is traditionally cooked in May-June with young asparagus and fresh crawfish; this recipe was introduced for the new “One-Dish Sunday” meal program.

⁸⁹³ National Socialist slogans as quoted in Robert Proctor, *The Nazi War on Cancer* (Princeton: Princeton University Press, 1999), 120.

In his opening remarks for the 1928 “Nutrition” exhibition in Berlin, Prussian State Minister for Agriculture Heinrich Steiger (1863-1943) hoped that “the exhibition ... through word and picture would encourage the visitor to contemplate and then to do his part in the great task of directing the individual, the family and the whole population (*Volk*) in proper diet.”⁸⁹⁴ From 5 May through 12 August, the “hundred-day show” at the Kurfurstendamm fair grounds brought together science popularizers and industry representatives to educate and to entertain in the single most spectacular food- and nutrition-related exhibition in the early twentieth century. But the lectures, displays, and films had clear political overtones: eating right was not just recommended but required for the continued life and health of Germans, individually and collectively. Eaters should choose their meals based on the needs of the nation as well as on the strengths and limitations of their individual bodies. These decisions were generally enacted within the gendered and generational dimensions of family structures. And families acted as interlocutors between individuals and the population, whose well-being depended on theirs. The connectivity between these different levels of magnification (individual, family, collective) I have termed the “telescopic body” (or perspective).

Such an exposition would not have been entirely unthinkable in 1890. The 1883 Hygiene Exhibition in Berlin had showcased the latest technologies, statistics, and regulations the German state and its experts used to monitor and improve health, mostly for infants, prostitutes, and the tuberculous.⁸⁹⁵ Meanwhile, the ever-popular World’s Fairs (e.g. Paris, 1889; Chicago, 1893) had

⁸⁹⁴ “Die Ausstellung, so führte er u. a. aus, will den Besucher durch Wort und Bild zum Nachdenken veranlassen und ihn anregen, für seinen Teil ebenfalls mitzuarbeiten an der großen Aufgabe, den einzelnen, die Familie und das ganze Volk zu einer zweckmäßigen Ernährung zu erziehen.” “Die Ernährung des Menschen,” *Dresdner Anzeiger* 198, no. 211 (6 May 1928): 2.

⁸⁹⁵ Eike Reichardt, *Health, Race and Empire: Popular-Scientific Spectacles and National Identity in Imperial Germany, 1871-1914* (Lexington, KY: Lulu.com, 2008), 62-80.

combined international and industrial demonstrations with amusement-park amenities.⁸⁹⁶

“Nutrition” differed from these in that it adopted the tone of moral and patriotic responsibility for individual and therefore collective health that had appeared in popularizations of hygiene around the turn of the century. The Allied blockade and ineffective governmental responses had caused deprivations during and after World War I that amplified and concentrated this synecdochic trend in public health. Germany had enjoyed a much stronger agricultural trade balance in 1890, but now food autarky was discussed as an individual and collective desideratum.⁸⁹⁷ With various reformers, eugenicists, and pronatalists concerned about improving the quality of the population that had survived the conflict in the short term (while increasing its quantity over the long term), something as seemingly mundane as what to eat and drink constituted a legitimate, even pressing topic for public education in 1928 in a way that it had not four decades earlier. These were the politics of the table.

The content of the “Nutrition” exhibition was also different than if it had been held forty years earlier. Dresden Mayor Bernhard Blüher (1864-1938), who served as chairman of the board of the German Hygiene Museum, defended the Berlin exhibition—just two years after the 1926 Health, Social Welfare, and Physical Fitness fair in Düsseldorf (GeSoLei)—on the grounds that “the science of human nutrition has until now received too little attention, and the progress that science has made has not yet spread to the public.”⁸⁹⁸ It is true that the definition of a healthy diet had changed radically in the preceding decade and a half: by “progress” Blüher undoubtedly meant the transition from primarily quantitative to primarily qualitative nutrition. With

⁸⁹⁶ Paul Greenhalgh, *Ephemeral Vistas: The Expositions Universelles, Great Exhibitions and World's Fairs, 1851-1939* (Manchester: Manchester University Press, 1988).

⁸⁹⁷ E.g. “Was wünschen und erwarten wir im nächsten Jahrzehnt für die deutsche Volksernährung?” *Dresdner Hausfrau* 26 Bd. 2, no. 36 (6 June 1928): [4] and no. 37 (13 June 1928): II.

⁸⁹⁸ “Gerade die Wissenschaft der menschlichen Ernährung hat bisher viel zu wenig Beachtung gefunden, und soweit die Wissenschaft gewisse Fortschritte verzeichnet hat, sind sie noch nicht ins Volk gedrungen.” “Die Ernährung des Menschen,” *DA* 198, no. 211 (6 May 1928): 2. See also “Der Mensch ist, was er ißt. Rundgang durch die Berliner Ernährungsausstellung,” *DA* 198, no. 216 (9 May 1928): 5-6.

coupons measured in grams and liters and equivalences calculated in daily and weekly caloric values, war-time rationing had ingrained the calorie paradigm in anyone who did not know it already. (Remember that working-class activists used the Voit standard of 118 grams of protein per day to argue for higher wages.) Only in the 1920s did the scientific mainstream accept and propagate the vitamin paradigm. The result—a recommended diet rich in fruits and vegetables (some raw, or at least not boiled), whole-grains, meat, and dairy—looked (and tasted) suspiciously like the diet alternative medical practitioners and food reformers had been promoting, with varying amounts of meat and success, since the late nineteenth century.⁸⁹⁹

Nevertheless, one wonders according to which metric “the science of human nutrition ... received too little attention.” The preceding chapters have described numerous means by which nutritional knowledge circulated among kitchen, laboratory, clinic, and exhibition in the late-nineteenth and early-twentieth centuries, from doctors’ visits to journal and magazine articles, and from cookbooks to traveling shows and public lectures. If none of the efforts to inform lay Germans about the latest in diet and nutrition had reached their audiences in four decades, then this dissertation would be built on a shaky foundation indeed. On the contrary, Blüher was resorting to the language of ignorance as a common justification for hygiene education: scientists and physicians were experts, the public was ignorant, and the Hygiene Museum could transmit the necessary information from one to another.

Ignorance was (and is⁹⁰⁰) a common charge in discussions about food and nutrition, as we have seen throughout this study. Physicians like Otto Dornblüth assumed that the new generation of homemakers was ignorant of the proper way to cook. Heinrich Lahmann and other reformers

⁸⁹⁹ Martin Vogel, “Wissenschaft und Volk in Sachsen. Ansprache zur Eröffnung der Ausstellung ‘Richtige Ernährung’ in Leipzig, 29. September 1929,” *Hygienischer Wegweiser* 4, no. 4 (April 1929): 103-104.

⁹⁰⁰ David Smith and Malcolm Nicolson, “Nutrition, Education, Ignorance and Income: A Twentieth-Century Debate,” in *The Science and Culture of Nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, 288-318 (Atlanta: Rodopi, 1995).

agreed that immoderate diet had corrupted Germans' instincts, but many of them complained that academic medicine itself lacked common sense and disregarded alternative scientific research. Meanwhile, the medical establishment accused "quacks" like Lahmann of ignoring scientific evidence and the gullible public of being ignorant of the dangers of alternative medicine. Ragnar Berg reproached the canning industry for a combination of greed and ignorance about the necessity of steaming for retaining canned vegetables' minerals and high base content. During World War I, accusations of ignorance abounded: food shortages were blamed on farmers not knowing how bad the food situation was in the cities,⁹⁰¹ and Franz Dienemann chided Dresden's doctors for their unfamiliarity with the procedures for prescribing supplemental rations.

Of course, it is entirely probable that much of this "ignorance" actually represented different knowledges and priorities.⁹⁰² The young women who read Dornblüth's cookbook for the sick—or more likely, newer versions of Henriette Davidis's general cookbook—cooked with new ingredients and technologies that certainly changed their tastes and preferences. Lahmann's low-acid diet combined a mythical rural past with his clinical experience and understanding of physiology, and alternative practitioners knew very well the tenets of scientific medicine but preferred other body concepts. Furthermore, Germans' "ignorance" of the dangers of medical sects like homeopathy and naturopathy often reflected a desire for cheap medical care that they could perform at home without the risks associated with drugs and surgery. Industrialists who blanched raw produce in the process of canning it were doing no more than watching their bottom lines while following contemporary bacteriological and (mainstream) nutritional advice.

⁹⁰¹ E.g. Niederschrift über die 28. Sitzung des Ernährungsbeirats vom 8. November 1917, doc. 17-17/14, Nr. 23190 Protokolle über Ernährungsbeirats-Sitzungen Bd. 3, 10736 Ministerium des Innern, SHAD; August Skalweit, *Die deutsche Kriegsernährungswirtschaft* (New Haven: Yale University Press, 1927), 203-205.

⁹⁰² Uwe Spiekermann, "Science, Fruits, and Vegetables: A Case Study on the Interaction of Knowledge and Consumption in Nineteenth- and Twentieth-Century Germany," in *Decoding Modern Consumer Societies*, ed. Hartmut Berghoff and Uwe Spiekermann, 229-248 (New York: Palgrave Macmillan, 2012). Spiekermann argues that the German public knew very well what a "healthy" diet was but continued to purchase foodstuffs based on taste preferences and price, at least through the 1940s.

Farmers accused of hoarding or of driving up prices frequently rejected their “duty” to feed urban consumers at the cost of financial loss and food insecurity for their dependents.⁹⁰³ And in all fairness, the few overworked physicians left practicing civilian medicine during the war faced desperate patients and ever-changing regulations.⁹⁰⁴

Furthermore, the public’s ignorance of their bodies and of the principles of proper nutrition could not have been as severe as Blüher suggested, given the frequency with which a telescopic perspective was used to argue for the collective importance of individual behaviors like eating and physiological processes like digestion. Corporeal metaphors such as the *Volkskörper*—whose usage in public discourse peaked in the 1930s and 1940s⁹⁰⁵—required this scientific underpinning of biochemistry, anatomy, and physiology. As nutrition was by that time intimately connected with bodily health, and as bodily health was integral to the National Socialist racial project, controlling what different groups of people ate (and drank) was central to both the promises and the crimes of the Third Reich.⁹⁰⁶ Yet what the Nazis wanted and what they got were two different things, so let us examine their food ideology before moving on to their

⁹⁰³ Robert G. Moeller, “Dimensions of Social Conflict in the Great War: The View from the German Countryside,” *Central European History* 14, no. 2 (June 1981): 142-168.

⁹⁰⁴ Susanne Michl, *Im Dienste des “Volkskörpers”*: *Deutsche und Französische Ärzte im Ersten Weltkrieg* (Göttingen: Vandenhoeck & Ruprecht, 2007), 92.

⁹⁰⁵ Cornelia Schmitz-Berning, “Volksfremder, Volksgemeinschaft, Volksgenosse, Volkskörper, Volksschädling,” in *Vokabular des Nationalsozialismus* (New York: Walter de Gruyter, 1998), 653-664, 667-673; Wolfgang U. Eckart, “Die Vision vom ‘gesunden Volkskörper’: Seuchenprophylaxe, Sozial- und Rassenhygiene in Deutschland zwischen Kaiserreich und Nationalsozialismus,” in *Hauptsache gesund! Gesundheitsaufklärung zwischen Disziplinierung und Emanzipation*, ed. Susanne Roeßiger and Heidrun Merk, 34-47 (Marburg: Jonas Verlag, 1998); Ute Planert, “Der dreifache Körper des Volkes: Sexualität, Biopolitik und die Wissenschaften vom Leben,” *Geschichte und Gesellschaft* 26, no. 4 (2000): 539-576; Moritz Föllmer, “Der ‘kranke Volkskörper’. Industrielle, hohe Beamte und der Diskurs der nationalen Regeneration in der Weimarer Republik,” *Geschichte und Gesellschaft. Zeitschrift für historische Sozialwissenschaft* 27, no. 1 (2001): 41-68; Thorsten Halling, Julia Schafer, and Jörg Vögele, “Volk, Volkskörper, Volkswirtschaft—Bevölkerungsfragen in Forschung und Lehre von Nationalökonomie und Medizin,” in *Das Konstrukt “Bevölkerung” vor, im und nach dem “Dritten Reich”*, ed. Rainer Mackensen and Jürgen Reulecke, 388-428 (Wiesbaden: Verlag für Sozialwissenschaften, 2005); Peter Walkenhorst, *Nation-Volk-Rasse: Radikaler Nationalismus im Deutschen Kaiserreich 1890-1914* (Göttingen: Vandenhoeck & Ruprecht, 2007), esp. 80-165; Boaz Neumann, “The Phenomenology of the German People’s Body (*Volkskörper*) and the Extermination of the Jewish Body,” *New German Critique* 106 (Winter 2009): 149-181.

⁹⁰⁶ Wolfgang Heide, “Ernährungswirtschaft und Verbrauchlenkung im Dritten Reich 1936-1939” (diss., Free University of Berlin, 1989).

food policies and practices.

Nazi food ideology

“Man is what he eats” (*Der Mensch ist, was er ißt*) read the headline of one of the newspaper articles quoted above about the 1928 “Nutrition” exhibition in Berlin. This well-known phrase from nineteenth-century French gourmand Jean Anthelme Brillat-Savarin can be interpreted as a metaphysical statement about the nature of being. It also allows the possibility that individual behavior can be changed and if necessary improved. Many reformers saw the political and social changes of 1933 as a new beginning with new possibilities for social transformation.⁹⁰⁷ However, the some deep-seated biological identity like “race” that precludes the possibility of alteration, much less improvement, in the lifetime of the individual. Nazi food ideology was much less likely to admit the possibility of changeable biological identity than most of the social hygiene and eugenics literature from the Imperial or Weimar Periods.⁹⁰⁸

A particularly disturbing example comes from Ernst Hiemer’s (1900-1974) children’s book *The Poisonous Mushroom (Der Giftpilz, 1938)*. Its cover depicts mushrooms with exaggerated “Jewish” noses, and the title story explains that “the Jew is the most poisonous mushroom of all.”⁹⁰⁹ Suggesting that danger comes in through the mouth like tainted food, “Der Giftpilz” appealed to fears of contamination that analogized between racial undesirables and diseases like cancer or typhus.⁹¹⁰ An Aryan mother tells her son Franz that people are like mushrooms: some are good, some are bad, and it can be difficult to tell them apart by sight.

⁹⁰⁷ Florentine Fritzen, “Vom ‘Menschheitsfrühling’ zu ‘Neuform heil!’ wie Lebensreformer 1933 den Umbruch von der ‘Neuen Zeit’ zur ‘Großen deutschen Revolution’ vollzogen,” *Forschung Frankfurt* 24, no. 4 (2006): 63-66.

⁹⁰⁸ Klaus-Dieter Thomann, “Wissenschaftliche Sozialhygiene und gesellschaftliche Praxis im Deutschen Reich: Ein Beitrag zur Entwicklung der Sozialhygiene im ersten Drittel des 20. Jahrhunderts,” *Sudhoffs Archiv* 68, no. 1 (1984): 61-76; Renate Bridenthal, Atina Grossmann, and Marion Kaplan, eds., *When Biology Became Destiny: Women in Weimar and Nazi Germany* (New York: Monthly Review Press, 1984).

⁹⁰⁹ Melvin Konner, *The Jewish Body* (New York: Nextbook, 2009), 98. For a thorough discussion of the “Jewish” nose, foot, voice, etc., see Sander L. Gilman, *The Jew's Body* (New York: Routledge, 1991).

⁹¹⁰ E.g. Geoffrey Campbell Cocks, *The State of Health: Illness in Nazi Germany* (Oxford: Oxford University Press, 2012), 91-95, 219-235; Eckart, “Die Vision vom ‘gesunden Volkskörper,’” 38.

Although Jews might be baptized or try to dress up as doctors, they never lose their “true” nature: “Just as one single mushroom can kill an entire family, so a single Jew can destroy a whole village, a whole city, even an entire Volk.”⁹¹¹ The unsuspecting or ignorant family that consumed poisonous mushrooms might die, just like a community or even the entire Volk in the presence of even one son or daughter of Abraham. This kind of anti-Semitic propaganda poisoned Germans against their Jewish neighbors.

On the level of the individual, Nazi food ideology meant self-control of one’s appetites. Munich dermatologist Franz Wirz (1889-1962), who held high-ranking positions for education and food policy in the Nazi Party and State, explained as much in an article on the challenges facing the German people.⁹¹² He begins by establishing the appropriate relationship between individual and collective. “In the National Socialist state,” writes Wirz, “it is never a question about whether it is going well for this or that person according to his own point of view, rather it is a question about whether it is going well for the whole Volk.”⁹¹³ And it was not going well for the German nation, whose industrialized, modern diet was making it sick. Wirz imagines the situation in which an otherwise well-endowed representative of a superior gene pool eats, drinks, or smokes himself to ruin. But “[his deterioration] is less important than the fact that he has inflicted damage to the whole Volkskörper. . . . metabolic disorders, tooth decay, and infertility is the way in which the harmful diet of the individual leads to injury of the whole Volk.”⁹¹⁴

⁹¹¹ “Genau wie ein einziger Pilz eine ganze Familie töten kann, so kann ein einzelner Jud ein ganzes Dorf, eine ganze Stadt, sogar ein ganzes Volk zerstören.” Ernst Hiemer, *Der Giftpilz* (Nürnberg: Stürmer Verlag, 1938), 7.

⁹¹² Franz Wirz, “Nationalsozialistische Forderungen an die Volksernährung,” *Die Ernährung* 1, no. 3 (1936): 103-112; Jörg Melzer, *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch* (Stuttgart: Franz Steiner, 2003), 183-185.

⁹¹³ “Im nationalsozialistischen Staate handelt es sich niemals darum, dass es diesem oder jenem Menschen an sich, nach seinem eigenen Gesichtspunkt gemessen, gut geht, sondern es handelt sich darum, ob es dem ganzen Volke gut geht.” Wirz, “Nationalsozialistische Forderungen an die Volksernährung,” 105.

⁹¹⁴ Wirz: “so ist das weniger wichtig als die Tatsache, daß er damit dem ganzen Volkskörper Schaden zufügt. Ich wiederhole nochmals: Stoffwechselkrankheiten, Gebißverfall und Unfruchtbarkeit, das ist der Weg, über den die schädliche Ernährung des einzelnen zu einer Schädigung des ganzen Volks führt.” “Nationalsozialistische

Nutritional science could eventually make up for their lost instincts; until then, Germans had to apply reason and will to their diets. It was therefore the responsibility of Party members to conduct themselves as examples for the rest of the populace, consuming a diet that was “natural, pure, and simple” (*natürlich, rein und einfach*).⁹¹⁵ When deciding what to eat or drink, the question “Am I serving my people with this?” was supposed to be paramount.⁹¹⁶

However, it does not suffice to say that the individual was subsumed by the collective in fascist societies.⁹¹⁷ In their social organization, they hovered between the separate spheres of liberalism and the radical reorganization of communism. Hitler’s Germany and Mussolini’s Italy, with their penchant for traditional gender roles and aversion to “Bolshevism,” preserved the family as a necessary (but not unproblematic) institution within the one-party state. Lisa Pine has argued that the family in Nazi Germany was the “germ cell of the nation,” nurturing individuals for the good of the Volk.⁹¹⁸ This redirected the trajectory of the telescopic body from the relatively state-free domestic realm created during the Weimar period to one aligned with the government.⁹¹⁹ The fascist family was also unlike the communist ideal of the early Soviet Union, which sought to centralize identity and action.⁹²⁰ Certain duties in the Third Reich were parceled out to lower levels of organization—like feeding to families and reproduction to individuals—albeit it within guidelines established by the state. Although canteens and public kitchens became

Forderungen,” 107.

⁹¹⁵ Wirz, “Nationalsozialistische Forderungen an die Volksernährung,” 109.

⁹¹⁶ “Diene ich damit meinem Volke?” Wirz, “Nationalsozialistische Forderungen an die Volksernährung,” 112.

⁹¹⁷ E.g. Victoria De Grazia, *How Fascism Ruled Women: Italy, 1922-1945* (Berkeley, CA: University of California Press, 1992), 279. Cf. Moritz Föllmer, “Was Nazism Collectivistic? Redefining the Individual in Berlin, 1930–1945.” *Journal of Modern History* 82, no. 1 (March 2010): 61-100.

⁹¹⁸ Lisa Pine, *Nazi Family Policy, 1933-1945* (Oxford: Berg, 1997), 10, 71, 179; for the Italian *cellula madre*, De Grazia, *How Fascism Ruled Women*, 79.

⁹¹⁹ Michelle Mouton, *From Nurturing the Nation to Purifying the Volk: Weimar and Nazi Family Policy, 1918-1945* (New York: German Historical Institute & Cambridge University Press, 2007).

⁹²⁰ Communal living was an expediency at a time of housing shortage as well as an ideological goal. Stephen Kotkin, “Living Space and the Stranger’s Gaze,” in *Magnetic Mountain: Stalinism as a Civilization* (Los Angeles: University of California Press, 1995), 157-197; Sheila Fitzpatrick, *Everyday Stalinism: Ordinary Life in Extraordinary Times; Soviet Russia in the 1930s* (New York: Oxford University Press, 1999), 46-50.

increasingly common late in the war, and despite the existence of fringe initiatives like the Lebensborn program, the Nazis were not so socialist as to set out to make eating or reproduction public and collective functions.⁹²¹ Instead of mandatory public kitchens, there was a campaign for Sunday one-pot meals around the family table. Instead of government-sponsored childcare for working mothers, women were incentivized or forced out of the workplace to bear and raise their children at home.⁹²² Thus the private sphere retained official importance in the Third Reich, if only as a staging ground for state desires.⁹²³ For perpetrators, bystanders, and resisters alike, the family served a refuge from the violence of the regime and its war.⁹²⁴

On the level the nation in Nazi food ideology, Adolf Hitler had set the tone in *Mein Kampf* when he wrote from Landsberg prison,

Only when the Reich's frontiers include the last German, and when it is unable to assure its food supply, does there grow out of the needs of its own people the moral right to occupy foreign earth and soil. The plow is then the sword, and the daily bread of posterity grows out of the tears of war.⁹²⁵

If, or rather when the Greater Germany he imagined ran out of room to live (*Lebensraum*) and land on which to sustain itself, then it had the right to take what it needed from others. The driving force behind this imperialism was not the desire to rule over more subjects or more territory than the next empire but specifically to conquer land whose agricultural exploitation would secure the continued existence of this supposedly chosen people. Hitler promised to

⁹²¹ On the failures of both rations and canteens, Argus, "Behind the Enemy Line," *Nation* 158, no. 21 (20 May 1944): 596. On Lebensborn, Pine, *Nazi Family Policy*, 39-42; and Claudia Koonz, *Mothers in the Fatherland: Women, the Family and Nazi Politics* (New York: St. Martin's Press, 1987), 398-400.

⁹²² Kindergartens were intended to protect the health of the next generation and to begin their indoctrination into proper Germanness; unlike the (small) Lanham Act (1942) appropriation in the United States, they were not intended to allow women to work outside the home. Pine, *Nazi Family Policy*, 28-34; Elizabeth Harvey, *Women and the Nazi East: Agents and Witnesses of Germanization* (New Haven: Yale University Press, 2003), 52-57, 233-260.

⁹²³ "While Nazi rhetoric evoked the nostalgic myth of a sheltering [preferably peasant] family, state policy promoted a submissive family that delivered up its members to the total state." Koonz, *Mothers in the Fatherland*, 388 and 178-179.

⁹²⁴ Claudia Koonz, *Mothers in the Fatherland*, 408-420; De Grazia, *How Fascism Ruled Women*, 112-115. Sometimes they looked forward to family life after Germany won the war. Föllmer, "Was Nazism Collectivistic?," 93-97

⁹²⁵ From p. 7 of *Mein Kampf*, as quoted on p. 38 of Frederick L. Schuman, "The Third Reich's Road to War," *Annals of the American Academy of Political and Social Science* vol. 175: The Shadow of War (Sept. 1934): 33-43.

reverse the Biblical prophecy that one day, the nations would beat their swords into plowshares and their spears into pruning hooks (Isaiah 2:4). Instead of peace, Germans would learn war, and they would win their daily bread on the battlefield.

Nazi food policies and practices

These convictions—and memories from the lean years of the Great War—shaped domestic food policies in the Third Reich as well as the conduct of World War II. The National Socialists clearly believed that they possessed the correct answers to all the social upheavals of the early twentieth century, from the Woman Question to the Jewish Problem. At the beginning of their twelve-year reign, they seem to have assumed that rational individuals, wanting to make the best decisions, would decide in favor of the solutions the fascists favored, whether it was that women should stay home and raise children or that Jews should emigrate. As individuals continued to make what they considered to be poor or even wrong decisions, the Party line hardened. Nazis confronted (perceived) ignorance with escalating levels of coercion, from more education, to government regulations designed to restrict choice, to theft and out-right starvation.

National Socialist food practices brought this biopolitical struggle to Germans' tables almost immediately. 1 October 1933 was the inaugural "One-Dish Sunday" (*Eintopfsonntag*), henceforth observed on the first Sunday of the month from October to March. All households and restaurants were strongly encouraged to serve a simple meal with ingredients that cost no more than 50 cents per person and then donate the money saved from the typical Sunday roast to the Winter Relief Organization (*Winterhilfswerk*, WHW).⁹²⁶ Those who participated were materially and ideologically supporting the new regime. Those who did not risked harassment from their neighbors or members of the SA, SS, or National Socialist Welfare Organization (*NS-*

⁹²⁶ Nancy Ruth Reagin, *Sweeping the German Nation: Domesticity and National Identity in Germany, 1870-1945* (New York: Cambridge University Press, 2007), 125. On the evolution from small, voluntary domesticity programs during the 1920s to large and/or coercive ones in the 1930s and 1940s, see chapters 4-6 more generally.

Volkswohlfahrt, NSV), who went door-to-door to collect the donations. Newspapers and cookbooks offered recipes like the one at the start of the conclusion, and the program was quite successful.⁹²⁷ To further demonstrate the unity of the national community (*Volksgemeinschaft*) on this issue—and to garner support from the poor and unemployed—the NSV also hosted one-dish dinners in the squares of larger cities. These were a comical re-creation of that most domestic of rituals—the weekly Sunday dinner—in the most public of spaces and are an excellent example of how under Nazism, the personal was political and the private had largely become public.

From dozens of political parties to one, from a plethora of independent social organizations to those approved by the Party and the state, the public sphere narrowed after the National Socialists' seizure of power in 1933. Leeway for discussions about hygiene had narrowed, too. Bruno Gebhard, Assistant Science Director at the Germany Hygiene Museum in Dresden, reflected in his autobiography that by 1935, “the time for social medicine was over—for how long, I could not tell.”⁹²⁸ Only racial hygiene was now allowed. While during the Weimar period social medicine had encouraged “health care” (*Gesundheitsfürsorge*), during the NS period racial hygiene demanded “health management” (*Gesundheitsführung*).⁹²⁹ In practice this looked like one Party, one State, and many competing health organizations.⁹³⁰ Lack of coordination from

⁹²⁷ In the winter of 1935-1936, the NSV collected more than 31 million Reichsmark alone. “Der Eintopfsonntag,” LeMO [Lebendiges virtuelles Museum Online], accessed 5 July 2013, <http://www.dhm.de/lemo/html/nazi/innenpolitik/eintopf/>.

⁹²⁸ Bruno Gebhard: “aber mit der sozialen Medizin war es vorbei—für wie lange, konnte ich nicht ahnen.” *Im Strom und Gegenstrom, 1919-1937* (Wiesbaden: Franz Steiner, 1976), 89.

⁹²⁹ Michael Kater, “Die ‘Gesundheitsführung’ des Deutschen Volkes,” *Medizinhistorisches Journal* 18, no. 4 (1983): 349–375; Winfried Süß, *Der “Volkskörper” im Krieg: Gesundheitspolitik, Gesundheitsverhältnisse und Krankenmord im nationalsozialistischen Deutschland 1939-1945* (München: R. Oldenbourg, 2003), 292-310.

⁹³⁰ Among them were Offices for the Peoples' Health (*Ämter für Volksgesundheit*), Reichs Physician Leader (*Reichsärztführer*), Reichs Health Leader (*Reichsgesundheitsführer*), the General Commission for Sanitation and Public Health (*Generalkommissar für das Sanitäts- und Gesundheitswesen*). Süß, *Der “Volkskörper” im Krieg*, 41-126, 151-168; Kater, “Die ‘Gesundheitsführung’ des Deutschen Volkes.” Specifically for Dresden see Fäßler, Peter. “Sozialhygiene—Rassenhygiene—Euthanasie. ‘Volksgesundheitspflege’ im Raum Dresden,” in *Dresden unterm Hakenkreuz*, ed. Reiner Pommerin, 193-207 (Cologne: Böhlau, 1998).

above only made it that much more likely that Germans would encounter a surveilling medical apparatus. They had lost their right to be sick and gained an explicit duty to be healthy.

We can track this change in milieu in the re-casting of the subjects and objects of hygiene education. In Germany in the nineteenth and early twentieth centuries, health reformers of all stripes had understood their task as the “enlightenment” (*Aufklärung*) of the population. This sentiment was usually paired with a positivistic belief in an individual’s ability to educate himself and to change his lifestyle for the betterment of his individual and social health. It could be seen in a variety of cultural movements, from middle-class education and self-improvement (*Aufbildung*) in the mid-nineteenth century to the self-help movements of the Wilhelminian Empire and Weimar Republic.⁹³¹ Under the National Socialists, the German government gradually adopted a new tack: enlightenment from above, starting with Josef Goebbels’s Ministry of Popular Enlightenment and Propaganda (*Ministerium für Volksaufklärung und Propaganda*). “*Aufklärung* in the Nazi period becomes another word for propaganda—a one-way flow of information, a vectored and extreme form of clarification,” writes historian Robert Proctor.⁹³² The rhetorics of self-improvement and self-help were replaced with the coercion to “choose” wisely. Put another way, “enlightenment in the Nazi era was not something you yourself strived to attain, but rather something you did to other people or other people did to you.”⁹³³ In essence, the Nazis did not believe others should have the right to make other (read: wrong) decisions. Their ultimate goal was to control individual decision making for the good of the collective.

The example of whole-grain bread demonstrates the National Socialists’ progression

⁹³¹ Michael Hau, *The Cult of Health and Beauty in Germany: A Social History 1890-1930* (Chicago: University of Chicago Press, 2003).

⁹³² Proctor, *The Nazi War on Cancer*, 50.

⁹³³ Proctor, *The Nazi War on Cancer*, 49.

from education to coercion. Whereas many Germans impacted by the depression had to buy the cheaper rye bread during the years around 1930, full employment and the improved economic situation later in the decade allowed them to afford refined wheat bread again. But the consumption of hardy rye bread not only aligned with Nazi idea(l)s regarding a diet that was “natural, pure, and simple,” it also supported domestic rye agriculture, which otherwise had to compete against mostly imported wheat. Propagandists like Wirz and the German Hygiene Museum thus sought to alleviate ignorance in the population about the correctness of eating rye bread for the health of individual and collective alike.

But personal economics and preference were more powerful drivers than either education or ideology. The 1935 Bread Law (*Brotgesetz*) that standardized weights, brands, and packaging failed to increase consumption of whole-grain bread. When the Saxon District Office for the People’s Health (*Gauamt für Volksgesundheit*) realized that Saxons were not eating rye baked goods because there was little to buy or because what the stores offered was difficult to digest, it undertook a campaign in 1938 to train millers and bakers that was soon implemented elsewhere in the Reich.⁹³⁴ This education succeeded only in increasing consumption among Germans already committed to the cause. Finally, in the name of war-preparedness, the Reichs Committee for Whole-Grain Bread (*Reichsvollkornbrotausschuß*) enforced dark bread for the “master race” and nutrient-poor refined bread for forced laborers and Jews. This good science put in service of bad politics is why “after the Second World War the worry about one’s daily bread was not a worry about one’s whole-grain bread.”⁹³⁵

⁹³⁴ Spiekermann, “Vollkorn für die Führer: zur Geschichte der Vollkorn-Brotspolitik im Dritten Reich,” *Zeitschrift für Sozialgeschichte des 20. und 21. Jahrhunderts* 16, no. 1 (Jan. 2001): 91-128.

⁹³⁵ “Nach dem Zweiten Weltkrieg dominierte die Sorge um das tägliche Brot, doch es war nicht die Sorge um das Vollkornbrot.” Spiekermann, “Vollkorn für die Führer,” 127. For more on the food situation in Germany after the war, Alice Weinreb, “For the Hungry Have no Past nor do They Belong to a Political Party: Debates over German Hunger after World War II,” *Central European History* 44, no. 1 (March 2012): 50-78.

Government regulations similarly sought to redirect and restrict choice when it came to the consumption of dietary fats, namely butter and margarine. For reasons of food autarky, the Nazis wanted Germans to eat less margarine, since its production depended upon imported raw materials.⁹³⁶ For reasons of war preparedness, they wanted them to eat less butter, too.⁹³⁷ To these ends, customer lists and limits were introduced in October 1935. Farmer Walter Oskar Lohs (1879-1959), who owned a struggling estate at Berthelsdorf bei Hainichen outside Chemnitz, wrote in his journal,

The well-known effects of every controlled economy have come to pass. People are already standing in lines in butter shops again, and they only get half [kilo?] pieces. A nurse only gets a quarter piece. There is no fat or margarine anymore, pigs are rationed. All this the results of crazy price politics. The workers—plebs—must get stupidly low food prices and everyone else, no matter whether high government official or big industrialist, gets *Volksgemeinschaft*—⁹³⁸

Lohs voted with his bank account. Disgusted with the planned economy during World War I and throughout the 1920s, he had joined the NSDAP in February 1932, flying a swastika flag over Hermannshof all that summer. He had supported the SA in various ways, too. But the new government had reduced butter prices in June 1934 despite a drought that decreased the amount of milk his cows could make, so his debt was only worsening.⁹³⁹ According to Lohs, even the market regulation (*Marktordnung*) of the new Reichs Food Corporation's (*Reichsnährstand*)

⁹³⁶ Sabina Merta, "Margarine in Competition with Butter in Germany (1872-1933): The Example of Van den Bergh's Margarine Factory in Kleve," in *The Food Industries of Europe in the Nineteenth and Twentieth Centuries*, ed. Derek J. Oddy and Alain Drouard, 119-132 (Farnham, Eng.: Ashgate, 2013), 127; Dietmar Petzina, *Autarkiepolitik im Dritten Reich* (Stuttgart: Deutsche Verlagsanstalt, 1968).

⁹³⁷ In April 1933, the government began restricting margarine production and consumption. On 1 July 1934 it introduced regulations standardizing five kinds and quality of butter: German Best-Quality Butter (*Deutsche Markenbutter*), Fine Butter (*Feine Molkereibutter*), Standard Butter (*Molkereibutter*), Country Butter (*Landbutter*), Cooking Butter (*Kochbutter*). The same year it introduced 27 kinds of cheese with 8 different fat contents. Docs. V, IX, XII, Nr. 46 (II, Nr. 17), 2.3.27 Wohlfahrtspolizeiamt 1871-1945, Stadtarchiv Dresden.

⁹³⁸ "Die bekanntesten Folgen jeder Zwangswirtschaft sind eingetreten. In den Buttergeschäften stehen die Leute schon wieder Schlange und es gibt nur ½ Stückchen. Eine Krankenschwester bekommt nur ein ¼ Stückchen. Fett und Margarine gibt es nicht mehr, die Schweine werden zugeteilt. Alles die Folgen der verrückten Preispolitik. Der Arbeiter—Plebs—muß unsinnig billige Lebensmittelpreise bekommen und alle anderen ganz gleich ob hoher Staatsbeamter oder großer Industrieller, mit ihm, Volksgemeinschaft—[.]” 24 Oct. 1935, p. 55, Nr. 1 Tagebuch (1919-1937), 12728 Personennachlass Walter Oskar Lohs, SHAD.

⁹³⁹ 4 Aug. 1934, pp. 45-46, Nr. 1 Tagebuch, 12728 Lohs, SHAD.

amounted to socialist slavery; it meant the same lack of control over his business and more debt when he had to sell his products for less than it cost him to produce them.⁹⁴⁰ As far as Lohs was concerned, the result of the newest food regulations was one big unhappy people's community of scarce butter.⁹⁴¹ His only consolation was that "even harsh lords do not rule for long, and lies have short legs. He who does not keep his promises loses the faith" of the people.⁹⁴²

The results of the Third Reich's rearmament at the expense of both food producers and consumers quickly became apparent to the regime's critics. A satirical photomontage by the German Communist, pacifist, and Dadaist John Heartfield (1891-1968) absurdly and brilliantly critiques these domestic policies. Published from exile in Prague, "Hurray, the Butter is All Gone!" (1935) lends itself to wry comments about the old imperial slogan "blood and iron." It depicts an extended family sitting around a dinner table laden with metal weights, truck axels, and a bicycle. Oma bites a shovel, while the baby in the carriage gums an axe emblazoned with a swastika; even the dog has to content himself with a large nut and bolt in place of a bone. Hitler had promised to feed the German people from the German soil, much as the Kaiser's government had during World War I. But with resources increasingly directed toward (illegal) rearmament programs, the illustration implies, there are few leftover for food production.⁹⁴³ In other words, in Hitler's Germany there is plenty to eat, but what there is, is made of steel and iron. Reichstag

⁹⁴⁰ Lohs mentions a "slave state" twice in 1919 (3 and 22 May) but some form of being "a slave to Hitler" 14 times between his first and last entries during the Third Reich (Aug. 1934-June 1937); pp. 10, 11, 47-56, Nr. 1 Tagebuch, 12728 Lohs, SHAD. On the Reichsnährstand see Clifford R. Lovin, "Agricultural Reorganization in the Third Reich: The Reich Food Corporation (Reichsnährstand), 1933-1936," *Agricultural History* 43, no. 4 (Oct. 1969): 447-461; Gustavo Corni and Horst Gies, *Brot, Butter, Kanonen: die Ernährungswirtschaft in Deutschland unter der Diktatur Hitlers* (Berlin: Akademie Verlag, 1997), esp. 319-353; and Melzer, *Vollwerternährung*, 151-162.

⁹⁴¹ And scarcer margarine. On the failures of Nazi agro-economics, Mark Spoerer and Jochen Streb, "Guns and Butter—But No Margarine: The Impact of Nazi Agricultural and Consumption Policies on German Food Production and Consumption, 1933-38" (paper prepared for the IV International Economic History Congress, Helsinki, Finland, 21-25 Aug. 2006).

⁹⁴² Lohs: "auch strenge Herrn regieren nicht lange, und Lügen haben kurze Beine. Wer nicht hält was er verspricht, verliert das Vertrauen." 24 Oct. 1935, p. 55, Nr. 1 Tagebuch, 12728 Lohs, SHAD.

⁹⁴³ In food policy as in medicine: 1935 marked a shift from utopian aspirations (biodynamism, naturopathy) to more pragmatic goals that could support the war effort. Corinna Treitel, "Nature and the Nazi Diet," *Food and Foodways* 17 (2009): 138-158; Proctor, *Nazi War on Cancer*, 54-57, 120-172

President Hermann Goering's (1893-1946) justification for emphasizing war-readiness over gastric comforts clothed international aggression in the language of dietary health: "Ore has consistently made an empire strong, butter and lard have at most made a people fat."⁹⁴⁴

Recent studies have shown that even before out-right rationing was introduced on the eve of World War II,⁹⁴⁵ Germans' health suffered adversely from the (re)direction of resources toward military rather than consumer goods—especially basic ones like dietary fats and proteins.⁹⁴⁶ The average heights of children living in Leipzig rose over the 1920s but stagnated during the 1930s, and mortality from many infectious diseases rebounded in the 1930s compared to the 1920s.⁹⁴⁷ Disaffected physician-émigré Martin Gumpert (1897-1955) declaimed in his 1940 exposé *Heil Hunger!* that "Hitler's programme of health restoration is a crime against the health of 80 million people in the heart of Europe, a crime against the civilization of our world" because it perverted the meaning of health and made a mockery of social medicine.⁹⁴⁸

While adverse health effects early in the Third Reich have surprised historians who relied on consumer satisfaction to explain why so many Germans allowed atrocities to occur around them, poor physical and mental health, illness, and death for persons excluded from the *Volks-gemeinschaft* and from subsistence food rations have never been surprising.⁹⁴⁹ Even before 1933

⁹⁴⁴ "Erz hat stets ein Reich stark gemacht, Butter und Schmalz haben höchstens ein Volk fett gemacht." "Hurrah, die Butter ist alle!," *Arbeiter-Illustrierte-Zeitung* (19 Dec. 1935), John Heartfield, Dada Photomonteur: Official Internet Archive, accessed 29 June 2013, <http://www.johnheartfield.com/JOHN-HEARTFIELD-ART/MONTAGE/heartfield-hurray-butter-gone.html>.

⁹⁴⁵ Although fats had been rationed since 1 Jan. 1937, cards were not required for most food purchases until 28 Aug. 1939. Arnulf Huegel, *Kriegsernährungswirtschaft Deutschlands während des Ersten und Zweiten Weltkrieges im Vergleich* (Konstanz: Hartung-Gorre Verlag, 2003), 329; Corni and Gies, *Brot, Butter, Kanonen*, 555-558.

⁹⁴⁶ Cocks, *The State of Health*, 62-67, 76-91; Süß, *Der "Volkskörper"*, 179-241, 292-310; Elizabeth M. Collingham, *The Taste of War: World War Two and the Battle for Food* (London: Allen Lane, 2011), 26-38, 353-358.

⁹⁴⁷ Jörg Baten and Andrea Wagner, "Autarchy, Market Disintegration, and Health: the Mortality and Nutritional Crisis in Nazi Germany 1933-1937," *Economics and Human Biology* 1 (2003): 1-18, here 7 and 17; *ibid.*, "Mangelernährung, Krankheit und Sterblichkeit im NS-Wirtschaftsaufschwung (1933-1937)," *Jahrbuch für Wirtschaftsgeschichte* 1 (2003): 99-123.

⁹⁴⁸ *Heil Hunger! Health under Hitler*, trans. Maurice Samuel (New York: Alliance Book Corporation; Longmans, Green & Co., 1940), 13.

⁹⁴⁹ E.g. Cocks, *State of Health*, 219-235.

National Socialists clearly did not shy away from using retributive violence against those deemed irredeemable (e.g. Communists) or in order to persuade others (e.g. moderates) to side with them.⁹⁵⁰ The growing suspicion that the members of some groups were incapable of making the right decisions emboldened the NS government in both their population and food policies: in the late 1930s and early 1940s, short rations for the mentally ill and disabled gave way to “mercy deaths.”⁹⁵¹ Emigration and resettlement programs became forced labor and extermination. And the morale-boosting One-Dish Sundays and Winter Relief programs were joined in wartime by race-based rationing that rewarded German citizens (*Reichsdeutsche*) with the food bounty stolen from occupied territories and that starved Poles, forced laborers, and concentration camp inmates (Jews most of all).⁹⁵² In fact, some of the earliest reports outside Europe of German atrocities revealed the systematic starvation of Soviet POWs, Polish civilians, and ghettoized Jews.⁹⁵³ Like a tourniquet around a limb, National Socialist food policies cut off sustenance to parts of the social body they deemed diseased and expendable.

Before the war, Deputy Führer Rudolf Heß (1894-1987) had succinctly summarized the relationship between iron and fat, food and war as “canons instead of butter,” but it was not a simple tradeoff.⁹⁵⁴ “At the strategic level,” writes historian Adam Tooze, “guns were ultimately viewed as a means to obtaining more butter, quite literally through the conquest of Denmark,

⁹⁵⁰ Dirk Schumann, *Political Violence in the Weimar Republic, 1918-1933: Fight for the Streets and Fear of Civil War* (New York: Berghahn Books, 2009); Richard Bessel, *Political Violence and the Rise of Nazism: The Storm Troopers in Eastern Germany, 1925-1934* (New Haven: Yale University Press, 1984).

⁹⁵¹ Heinz Faulstich, *Hungersterben in der Psychiatrie 1914-1949: mit einer Topographie der NS-Psychiatrie* (Freiburg i. B.: Lambertus, 1998), 101-314.

⁹⁵² In Collingham’s phrase, “Germany exported hunger to the East,” *The Taste of War*, 180-218; Huegel, *Kriegs-ernährungswirtschaft Deutschlands*, 337-357.

⁹⁵³ “Germans Impose Mass Death on Red Prisoners and Poles,” *LIFE* (23 Feb. 1942): 26-27 (Google eBook). The text accompanying horrific photographs of the starving and/or dead is unequivocal about Nazi atrocities against the Soviets, Poles, and especially Jews occupying their desired “*lebensraum*” [sic].

⁹⁵⁴ Reinhold Reith, “‘Hurrah die Butter ist alle!’ ‘Fettlücke’ und ‘Eiweißlücke’ im Dritten Reich,” in *Erfahrung der Moderne*, ed. Michael Pammer, Herta Neiß, Michael John, 403-426 (Stuttgart: Franz Steiner, 2007).

France and the rich agricultural territories of Eastern Europe.”⁹⁵⁵ “That is the mechanics of Nazi imperialism,” confirmed Gumpert:

in order to still the hunger existing in the Reich, new hunger-territories are “liberated,” and in order to still *their* hunger foreign peoples must be assaulted. The wheat of Hungary and the Ukraine, Roumanian oil, the fields of Yugoslavia, the cows of Holland and Denmark, the ore of Sweden: all of these countries must make up their minds whether or not they wish to be pulled along in the power avalanche.⁹⁵⁶

The Third Reich was, Joseph Goebbels said, “digesting” the “occupied territories.”⁹⁵⁷ Despite the German military’s best efforts to loot the continent, even citizens living in the Fatherland felt hunger in 1941, and a truly precarious situation set in near the end of the war and for the next two years, with both government and markets in shambles. Food autarky was a sham for an industrialized country in the heart of Europe, and neither could an imperialist war satisfy Nazi dreams for “living space.”

The telescopic body and the Volkskörper

Denied at the voting box, politics in the Third Reich took place in the street, on the marching field, and on the dining table, where individual bodies confronted ideology and economics at every meal.⁹⁵⁸ As the National Socialists’ goals and strategies changed, so did the meanings and power dynamics of what ordinary Germans ate and drank every day. Food was not a private matter. Because of Nazism’s in-group/out-group worldview, even those who made the “right” choices for non-fascist rationales or those who made “wrong” choices for whatever reasons could be assimilated in the dominant narrative, defined by their actions (supporting the regime) or their identities (ignorant Aryans who needed to be educated or regulated). “Politics is the fight for sustenance,” wrote the leader of a right-wing group that in the 1920s sent young

⁹⁵⁵ Tooze, *Wages of Destruction*, 163.

⁹⁵⁶ Gumpert, *Heil Hunger!*, 86. Emphasis in original.

⁹⁵⁷ Tooze, *Wages of Destruction*, 548.

⁹⁵⁸ Bessel, *Political Violence and the Rise of Nazism*; Nadine Rossol, *Performing the Nation in Interwar Germany: Sports, Spectacles and Political Symbols, 1926-1936* (New York: Palgrave Macmillan, 2010).

people to farms to replace foreign workers. “We experience in our bodies every day what it means to have practiced bad politics [under the wartime and socialist governments]. Because we Artamanen are fighting for our right to life, we are practicing politics.”⁹⁵⁹

The Nazis claimed that “your body belongs to the nation/Führer,” but they had to trust that Germans would cultivate themselves for the greater good, using techniques of discipline, self-expression, and health promotion that had been developed over the preceding half century. Historian Geoffrey Cocks has argued that “the modern self in Germany would be ever more a recourse since the Nazi state would increase the amount of attention paid to the health of the individual in the construction of a healthy racial community.”⁹⁶⁰ Individual choices—like exercise or calling in sick—could be thus both a service for and an escape from the regime. The Nazis could and did pay so much attention to individual health as the means to the end of a healthy racial community because of what I have called the “telescopic perspective.”

The telescopic body or perspective synthesizes developments in the human sciences, social theory, and political culture in the late-nineteenth and early twentieth centuries. Physiologists and microscopic anatomists showed that human bodies could be understood at ever-more-minute levels. Laboratory researchers were able to define the composition of foodstuffs more precisely, allowing nutritionists to couch their recommendations in terms not just of “protein” but of (non)essential amino acids, not just “nutrients” but vitamins and minerals. While mainstream physicians and scientists claimed to be the proper arbiters of health and

⁹⁵⁹ “Politik ist: Kampf um die Ernährungsgrundlagen. Lebensmöglichkeiten eines Volkes. Was es bedeutet, schlechte Politik getrieben zu haben, spüren wir jeden Tag am eigenen Leibe. Wir Artamanen kämpfen um unsere Lebensmöglichkeiten, deshalb treiben wir Politik.” Friedrich Schmidt, “Artamanenbewegung und Politik,” *Die Kommenden* (27 July 1927): 355; Stefan Brauckmann, “Artamanen als völkisch-nationalistische Gruppierung innerhalb der deutschen Jugendbewegung 1924-1935,” *Jahrbuch des Archivs der deutschen Jugendbewegung* Neu Folge Band 2, no. 5 (2006): 176–196; Michael H. Kater, “Die Artamanen—Völkische Jugend in der Weimarer Republik,” *Historische Zeitschrift* 213 (1971): 577-638.

⁹⁶⁰ Cocks, *State of Health*, 75. He defines “the modern individual self [as] constantly suspended between health and illness,” 2.

sickness, alternative researchers and healers vied for legitimacy and patients, too. The popular press and hygiene education circulated these ideas.

Between Georg Simmel's overstimulating metropolis and Max Weber's efficient bureaucracy lay numerous groups mediating between the physical bodies of their members and the metaphysical body of society, the nation, the race. In this study on food and nutrition, I have chosen to highlight "the family" as the most typical site for food consumption and as an institution many Germans across the socioeconomic spectrum invested with respectability, identity outside work, and hope for the future. But fin-de-siècle Germany was a nation of joiners, with Germans joining the youth movement, sporting groups, homemaker associations, trade unions, buyers' cooperatives, philanthropic associations, political parties, and religious organizations. These supra-individual levels of the telescopic body shaped their identities and connected them with each other. Sciences like social medicine, eugenics, or racial hygiene could conceivably solve social problems in the early twentieth century because society was thought of as a biological organism.⁹⁶¹

This project began as a study of the German concept of the *Volkskörper*. However, I discovered the term in primary sources much less frequently than the secondary literature had led me to believe, particularly before World War I. Until then, "Volkskörper," like "Volksgemeinschaft," was used occasionally by conservative historical actors like Karl August Lingner. After World War I, and especially from the late 1920s, writers and speakers all across the political spectrum applied "Volkskörper" to describe the organic connectivity of the German people. I wondered how it was that members of a nation as modern as Germany during the Weimar and

⁹⁶¹ Emile Durkheim, *The Division of Labor in Society*, trans W. D. Halls (New York: Free Press, 1997, 1893), 83-87, 101-109, 118-123; Alfred Grotjahn, "Fünfundzwanzig Jahre Soziale Hygiene. Rückblick und Ausblick," *Archiv für Soziale Hygiene und Demographie* Neue Folge, 5 (1930): 181-183; Eckart, "Die Vision vom 'gesunden Volkskörper,'" 40-45.

Third Reich periods could believe that sexual relations between two individuals of “different races” could disturb the collective health of the Volk. Why did Gustav Stresemann (1878-1929), an economist and moderate politician, use medical metaphors like “Our German people’s body is sick with fever” to describe the political situation in November 1923?⁹⁶²

It occurred to me that the answer lay in the very fact of Germany’s scientific and medical advancement, combined with all the public and private efforts to educate Germans about their bodies and those of their children, sexual partners, and colleagues. Anatomy and exercise physiology appealed to hikers, sports enthusiasts, and occupational designers. Infant care and cooking exhibitions were directed primarily toward young women and mothers, while both sexes welcomed opportunities to learn about venereal diseases. Tuberculosis lessons pertained to anyone who lived or worked in small, poorly ventilated rooms. With so much exposure to health and hygiene, nutrition was important not just to individual but also to collective health because Germans had learned the interconnectivity of their anatomico-physiological bodies with each other and with the economic and political life of their nation. Of all these things, food and drink were basic daily necessities as well as sites fraught with meaning. Even if they did not apply the science as expected, biological and specifically corporeal language had become a common feature of public discourse.⁹⁶³ It was not the “Volkskörper” concept that explained the centrality of nutrition but the underlying “telescopic body” concept.

The turning point was World War I. At the “Nutrition” exhibition in Berlin in 1928, what Walter Benjamin called “the political corner” showcased “odd food substitutes” (*merkwürdigen*

⁹⁶² “Unser deutscher Volkskörper ist fieberkrank und verträgt nicht die Eisenbartkur eines neuen Bürgerkrieges.” Thomas Raithel, *Das schwierige Spiel des Parlamentarismus: Deutscher Reichstag und französische Chambre des Députés in den Inflationskrisen der 1920er Jahre* (München: R. Oldenbourg, 2005), 305. At the time Stresemann was Chancellor and Foreign Minister; his coalition collapsed the next day.

⁹⁶³ Uwe Spiekermann, “Zeitensprünge: Lebensmittelkonservierung zwischen Haushalt und Industrie 1880-1940,” in *Ernährungskultur im Wandel der Zeiten*, ed. Katalyse e. V. and Buntstift e. V., 30-42 (Cologne: Katalyse, 1997).

Ersatzmitteln) collected during the war, relics of the not-too-distant past.⁹⁶⁴ In the face of the food and fuel shortages that generated “rum-substitute” and “Fruitogen” jam, it seemed to many that total war did require Germans to fight and eat as one. However, no planned economy was sufficiently flexible to replace the open market in foodstuffs. The result was a geographic and bureaucratic patchwork of restrictions, rules, and regulations that drew soldiers and civilians, producers and consumers into an all-encompassing network of antagonism. Collective decision-making over the course of the conflict settled on work (especially in the war industries) as the deciding factor in the allocation of scarce food resources, to the detriment of school-aged children, those on fixed incomes, and the sick. At the end of the war, their suffering was held up to international observers as the suffering of the entire nation. As a consequence, the National Socialists did not have to posit the *Volkskörper* as sick, because German self-image vis-à-vis other countries had been expressed in the stark terms of national weakness (but Aryan strength) since 1918. The *Volkskörper* was the temporary acme of a telescopic body that extended historically to the pre-war period and corporally from cells nourished by vitamins to stomachs fed on a predictable schedule, from individuals sitting down to table together to a nation of eaters (and drinkers) that went hungry or ate to satisfaction depending on their place in (inter)national economics and politics.

Conclusion

After World War II and the Holocaust, the idea of collective health remained in an aggregated, statistical sense; “*Volksgesundheit*” was still used to describe population-level health. But expressions of biological collectivism like “*Volksgemeinschaft*” and bodily metaphors like “*Volkskörper*” largely fell out of favor and are rarely used in political discourse

⁹⁶⁴ “Berliner Ernährungsausstellung,” *DA* 198, no. 210 (5 May 1928): 3; Walter Benjamin, “Jahrmarkt des Essens: Epilog zur Berliner Ernährungsausstellung,” in *Gesammelte Schriften*, ed. Rolf Tiedemann and Hermann Schweppenhäuser, vol. IV, part 1, ed. Tillman Rexroth, 527-532 (Frankfurt am Main: Suhrkamp, 1972), 530-531.

today.⁹⁶⁵ Instead, Germans are more concerned about “the people” as an economic body rather than as an organic body, particularly when it comes to issues like health insurance, immigration, and public welfare.⁹⁶⁶ The telescopic body, however, endures as a mode of synecdochic thinking underlying much of modern, biomedical public health. Dietary advice is still given in terms of nutrients (antioxidants, complex carbohydrates, polyunsaturated trans-fats); individual health is often measured in laboratory results (LDL, hemoglobin A1c); and collective health is reported in terms of average body mass index (BMI).⁹⁶⁷ In short, telescopic thinking explains how individual characteristics aggregate to become indicators of collective well-being.

Today’s nutrition movements still align along a telescopic spectrum. For instance, both mainstream and some alternative sources of advice employ reductionist views of foods and their interactions with bodies that involve macromolecules, calories, vitamins, minerals, and acid-base balance. Despite its name, the Whole Food Movement likewise defines “good” foods as those that are unprocessed, thus preserving their nutrients, including those as-yet undefined by laboratory science. Meanwhile, the Slow Food movement focuses on a higher level of magnification, namely the eating individual in good social company. The persistence of telescopic

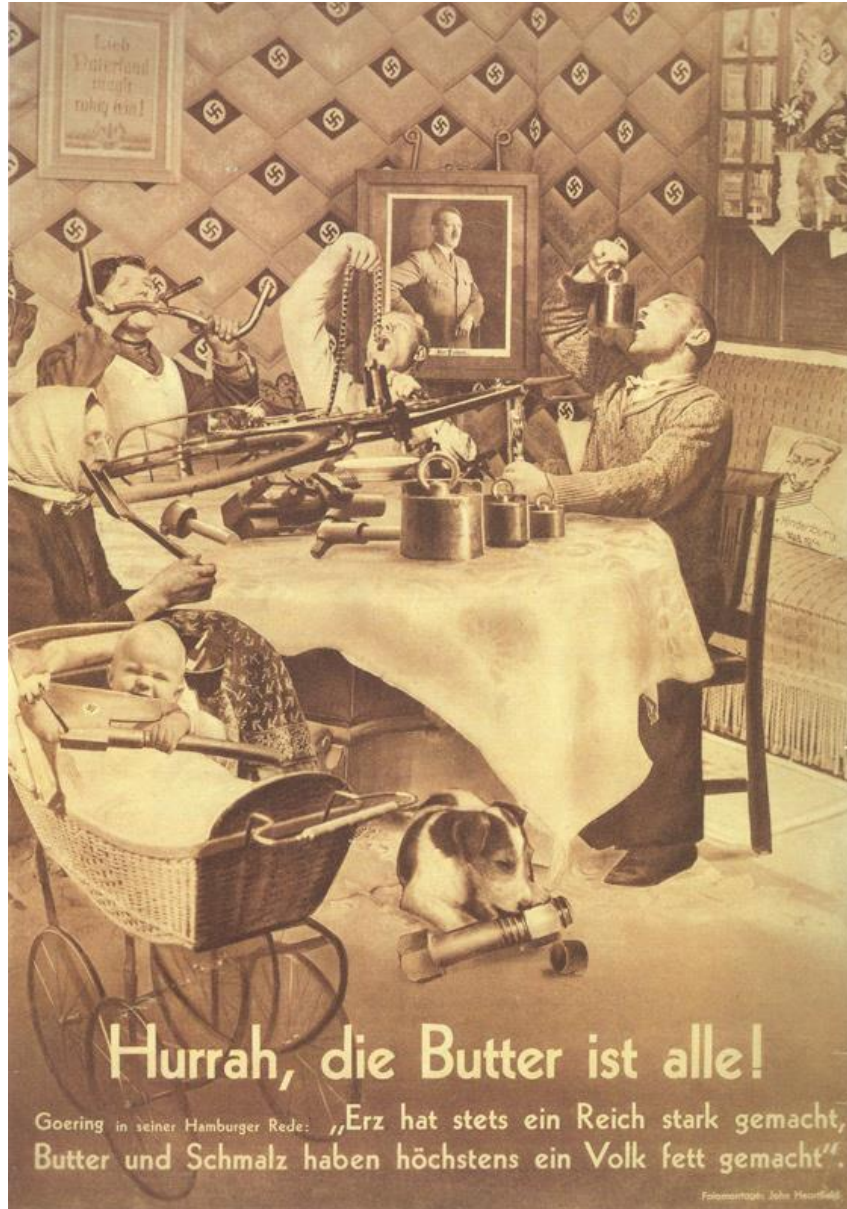
⁹⁶⁵ The idea of corporeal metaphors is not completely dead in popular discourse: on foreign bodies in the Germany body, see Annemarie Hürlimann, Martin Roth, and Klaus Vogel, eds., *Fremdkörper/Fremde Körper. Von unvermeidlichen Kontakten und widerstrebenden Gefühlen* (Ostfildern-Ruit: Hatje Cantz, 1999); on the cultural imperialism of assimilating foreign immigrants via their foods see Thomas Cernay, “Das Fressprinzip. Wie der Volkskörper sich selbst verdaut,” *Informationszentrum Dritte Welt* 253 (2001): 28; and on the Staatsbibliothek Berlin acting as the memory center of the city-organism of Berlin see Jakob Hein, “Das deklarative Langzeitgedächtnis Berlins,” *Bibliotheks-Magazin*, Sonderausgabe 350: Für Forschung und Kultur (2011): 119.

⁹⁶⁶ E.g. “Die Deutschen werden immer dicker -was tun?” thread initiated by ischi20 on [www.chefkoch.de](http://www.chefkoch.de/forum/2,22,114316/Die-Deutschen-werden-immer-dicker-was-tun.html), 12 Nov. 2004, accessed 23 Feb. 2012, <http://www.chefkoch.de/forum/2,22,114316/Die-Deutschen-werden-immer-dicker-was-tun.html>. For scholarly examples see Dieter Oberndörfer, “Zuwanderung und der Wohlstand Deutschlands,” *Sowi. Sozialwissenschaftliche Informationen. das Journal für Geschichte, Politik, Wirtschaft und Kultur* 31, 2 (2002): 86-91; Karen Pendergast, et al., compare effect of body size on health care costs in the US and Germany in “Impact of Waist Circumference Difference on Health-Care Cost among Overweight and Obese Subjects: The PROCEED Cohort,” *Value in Health* 13, no. 4 (June 2010): 402-410.

⁹⁶⁷ For the US case, see Michael Pollan, *In Defense of Food: An Eater's Manifesto* (New York: Penguin Press, 2009); Adele E. Clarke, Janet Shim, Laura Mamo, Jennifer Fosket, and Jennifer Fishman, eds., *Biomedicalization: Technoscience and Transformations of Health and Illness in the U.S.* (Durham, NC: Duke University Press, 2009); Arthur Agatston, “Why America is Fatter and Sicker Than Ever,” *Circulation* 126, 1 (3 July 2012): e3-e5.

perspectives demonstrates the success of efforts like the DHMD's to popularize biological sciences, including physiology and biochemistry. It is difficult to assume what their individual body concepts are, but the public are not as ignorant as Blüher imagined them to be.

Conclusion – Illustration



“Hurrah, the butter is all gone! Goering in his speech in Hamburg: ‘Ore has consistently made an empire strong, butter and lard have at most made a people fat.’”⁹⁶⁸ The room is decorated with symbols of the family’s loyalty to the Führer and a conservative vision of Germany. In addition to the swastika wallpaper, on the wall hangs a sampler with the first line of the chorus of one of Germany’s unofficial anthems, “Die Wacht am Rhine”: “Dear Fatherland, have no fear!” A portrait of Adolf Hitler stands in the corner, and a pillow with General and President Paul von Hindenburg’s face lies on the sofa.

⁹⁶⁸ “Hurrah, die Butter ist alle!,” *Arbeiter-Illustrierte-Zeitung* (19 Dec. 1935), John Heartfield, Dada Photomonteur: Official Internet Archive, accessed 29 June 2013, <http://www.johnheartfield.com/JOHN-HEARTFIELD-ART/MONTAGE/heartfield-hurray-butter-gone.html>. Image used with permission.

Appendix: Illustrations



A.1. Nutrition Exhibition (Berlin, 1928)

In the foreground, a spiraling cone shows how much of certain nutrients (water, protein, etc.) various foods contain. To the left is a bay about food preparation. In the background stands the ever-popular pyramid purporting to display the amount of food a man eats in one year.⁹⁶⁹



A.2. “Vitamin Content of Food”: from left to right vitamins D, A, B, C, E; and from top to bottom foods that are “free” of, “poor” in, and “rich” in each. For example, honey contains no vitamin B and tomatoes have little, while whole grains are rich in it.⁹⁷⁰

⁹⁶⁹ Photo 8, Sondergruppe Der Mensch und seine Ernährung auf der Berliner Ausstellung Die Ernährung (1928), DHMD 2009/627.1-23, DHMD Archiv, Dresden.

⁹⁷⁰ Photo 10, Sondergruppe Der Mensch und seine Ernährung auf der Berliner Ausstellung Die Ernährung (1928), DHMD 2009/627.1-23, DHMD Archiv, Dresden.



A.3. In the center is an interactive station labeled **“What happens where?”** Pushing the buttons would light up the part of his gastrointestinal tract that corresponded to the digestive process(es) on each label. To the left hangs a poster, **“How many times must a bite be chewed?”** The answer depended on the type of food arrayed around the clock face: less for soft vegetables, more for meat or crusty bread. To the right hangs a two-dimensional anthropomorphization of the digestive canal, with workers responsible for different **“jobs”** along its length. The glass cylinders below probably contain mock-ups of various digestive juices.⁹⁷¹

⁹⁷¹ Photo 20 (detail), Sondergruppe Der Mensch und seine Ernährung auf der Berliner Ausstellung Die Ernährung (1928), DHMD 2009/627.1-23, DHMD Archiv, Dresden.



A.4. “Odol. Absolute best mouthwash in the world!” (c. 1905)⁹⁷²



(Bild eines Odol-Tropfens im Mikroskop)

ODOL

hat folgende Wirkungen:

1. Gründliche Reinigung und nachhaltige Desinfektion des Mundes und der Zähne
2. Anregung und Belebung des Nervensystems
3. Beseitigung jedes üblen Mundgeruches und Erzeugung eines reinen frischduftenden Atems

Was das Odol vor allen anderen Mundreinigungsmitteln besonders auszeichnet, ist seine merkwürdige Eigenart, die Mundhöhle nach dem Spülen gewissermaßen mit einer mikroskopisch dünnen, dabei aber dichten antiseptischen Schicht zu überziehen, die noch stundenlang nachwirkt. Diese Dauerwirkung, die kein anderes Präparat besitzt, ist es, die demjenigen, der Odol täglich gebraucht, die Gewißheit gibt, daß sein Mund sicher geschützt ist gegen die Wirkung der Fäulniserreger und Gärungsstoffe, die die Zähne zerstören.

Odol-Zahnpasta ist wie Odol nach streng wissenschaftlichen Grundsätzen aufgebaut. Odol-Zahnpasta wird von uns nicht in schweren Bleituben, die zwar billig, aber scheußlich sind, geliefert, sondern — ohne Preiserhöhung — in reinen Zinntuben. Es gibt keine bessere Zahnpasta als Odol-Zahnpasta. Odol-Zahnpasta hat ebenfalls desinfizierende Wirkung, verhütet Zahnbelag und hat köstlichen Geschmack.



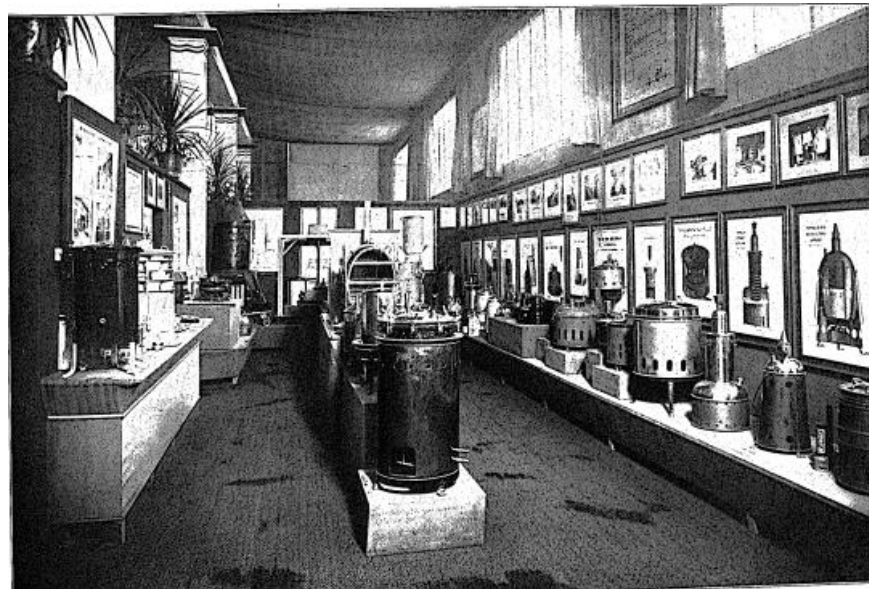
A.5. The image in the upper left is captioned “(Image of an Odol drop in a microscope).”⁹⁷³

⁹⁷² DHMD 2004/1378, DHMD Archiv, Dresden. This image is watermarked with the hygiene eye.

⁹⁷³ “Odol,” *Dresdner Hausfrau* 25, no. 49 (7 Sept. 1927): XI. Image courtesy of the Deutsche Nationalbibliothek.



A.6. “Main Hall of the Pavilion [at the German Cities Exhibition (Dresden, 1903)]. Under the microscopes the causes of infectious diseases, living and preserved. In the booths to the left and right the individual epidemic diseases in three-dimensional form (moulages) in addition to statistical and geographical information.”⁹⁷⁴ Notice the divans for resting.



A.7. “Disinfection Apparatuses.”⁹⁷⁵

⁹⁷⁴ Nr. 543. Haupthalle des Pavillons. Unter den Mikroskopen die Erreger der Infektionskrankheiten, lebend und in Dauerpräparaten. In den Seitenkojen links und rechts die einzelnen Volkskrankheiten in plastischer (Moulagen) Darstellung nebst statistischen und geographischen Angaben. Karl August Lingner, “Volkskrankheiten und ihre Bekämpfung,” in *Die deutschen Städte*, vol. 2, ed. Robert Wuttke (Leipzig: Friedrich Brandstetter, 1904), 318.

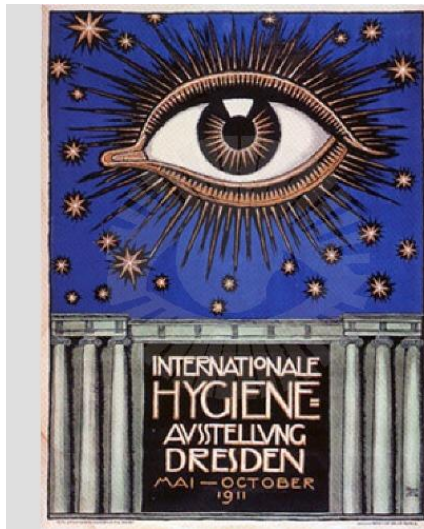
⁹⁷⁵ Nr. 545. Apparate zur Desinfektion. *Ibid.*, 319. Images courtesy Mansueto Library, University of Chicago.



DHMD 2001/195.32 Fotografie

Alle Rechte vorbehalten durch Stiftung Deutsches Hygiene-Museum
Lingnerplatz 1, 01069 Dresden, www.dhmd.de

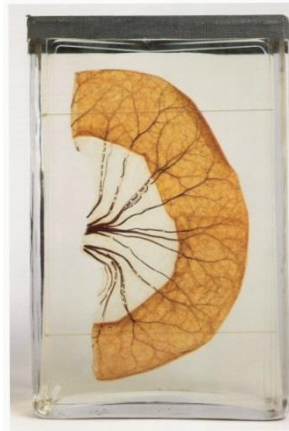
A.8. Statue of Hercules at the Entrance of the Popular Section at the 1. International Hygiene Exhibition (Dresden, 1911). “No riches/ compare with you/ O Health.”⁹⁷⁶



DHMD 1995/20 Plakat

Alle Rechte vorbehalten durch Stiftung Deutsches Hygiene-Museum
Lingnerplatz 1, 01069 Dresden, www.dhmd.de

A.9. Promotional Poster for the 1. International Hygiene Exhibition with the iconic, all-seeing hygiene eye in a starry sky (1911).⁹⁷⁷



A.10. Spalteholz Preparation of a segment of small intestine, encased in glass.⁹⁷⁸

⁹⁷⁶ DHMD 2001/195.32, DHMD Archiv, Dresden.

⁹⁷⁷ DHMD 1995/20, DHMD Archiv, Dresden.

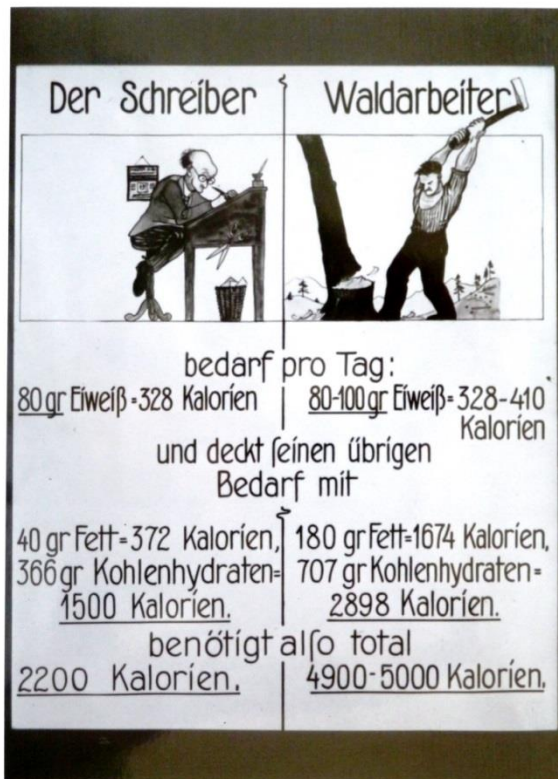
⁹⁷⁸ “Abb. 15. Darmschlinge, Feuchtpräparat nach Spalteholz, zwischen 1946 und 1971,” in Klaus Vogel, *Das Deutsche Hygiene-Museum Dresden 1911-1990* (Dresden: Stiftung Deutsches Hygiene-Museum, 2003), 26.



A.11. Nutrition at GeSoLei (Düsseldorf, 1926)

On the wall are reproductions of stylized enzymatic digestion in the mouth, stomach, and small intestine from Fritz Kahn's famous encyclopedia of human biology.⁹⁷⁹

The central glass case holds a 3D model of the gastrointestinal system.⁹⁸⁰



A.12. "The Clerk vs the Woodsman."

Both men need about 80 g protein (328 calories) for their daily basal metabolism. In addition the office worker needs 40 g fat and 366 g carbohydrates for a total of 2,200 calories per day. The laborer requires up to 5,000 calories per day.

⁹⁷⁹ Fritz Kahn, *Das Leben des Menschen. Eine volkstümliche Anatomie, Biologie, Physiologie und Entwicklungsgeschichte des Menschen*, vol. 3 (Stuttgart: Kosmos; Gesellschaft der Naturfreunde; Frank'sche Verlagshandlung, 1927), 101, 117, 134, 139, 147. Numerous illustrations from this book were made into wall posters for the show.

⁹⁸⁰ Photos 7 (detail) and 40 Nr. 2, GeSoLei 1926, DHMD 317.XII—Ernährung.1-59, DHMD Archiv, Dresden.



A.13. “The Preparation of Vegetables and Potatoes in the Kitchen.” The German Hygiene Museum produced this poster for the Gesundheitspflege—Soziale Fürsorge—Leibesübungen (GeSoLei) Exhibition in Düsseldorf in 1926.


Best practice: steam the vegetables in fat or butter[;] steam potatoes in a steamer.

Correct: Pour off the cooking water, but re-use it for soups and sauces. Cook potatoes with so little water that it cooks off when the potatoes are done.

False: Throw away the cooking water, thereby losing valuable nutrients, especially minerals and accessory nutritional factors [vitamins].^{xi}


⁹⁸¹ Photo 53, GeSoLei 1926, DHMD 317.XII—Ernährung.1-59, DHMD Archiv, Dresden.

Die Eiweiss, Salz, Zucker und Duftstoff lösende Fähigkeit des kalten Wassers bewirkt das Auslaugen der Nahrungsmittel, wenn man sie in kaltem Wasser zum Kochen ansetzt. Man setzt deshalb alle die Nahrungsmittel in kaltem Wasser an, deren Zellinhalt man auslaugen will.



In kochendem Wasser:

In kochendem Wasser gerinnen sowohl Hühnereiweiss als auch die Eiweisstoffe der Zellen. Es bildet sich eine feste Schicht, die ein weiteres Auslaugen verhindert. Durch Überbrühen löst man Salze, Duftstoffe aus Pflanzenteilen, von denen man nur diese Stoffe wünscht. Kochendes Wasser, Gemüsewasser etc. enthält stets viel wertvolle Stoffe. Darf nicht fortgossen werden. Stärke ist nur in Abbauprodukten verdaulich. Mehligartige Speisen werden durch Verkleistern beim Kochen verdaulich.



Beim Abbrühen von 100 Gr Weisskraut gehen 12,90 Gr Nährstoffe verloren.

Der Gasverbrauch GmbH
Abt. Außendienst
Berlin 1929

Chemie des Kochens. II

M 130

A.14. “The Chemistry of Cooking II.” Cooking foods in cold water supposedly leached more nutrients than with hot water, so broths should be put on the stove with cold water. Hot water curdled proteins and created a protective “sear.” The water from boiling vegetables like cabbage contained “valuable components” (wertvolle Stoffe) and





should not be thrown away. Carbohydrate-rich foods became more digestible (verdaulich) by cooking.⁹⁸²

In Dampf:





In Dampf werden die Speisen gar ohne ausgelaugt zu werden. Beim Garkochen im Dampftopf werden die Zellverbände am wenigsten zerrissen und fast alle Nährsalze bleiben in den Speisen enthalten.

In Heissluft und Fett:

In heisser Luft verdunstet das Wasser aus den äusseren Zellen und auf den Speisen bildet sich die wohlschmeckende Kruste durch Bräunen der Zucker- und Eiweisstoffe bei trockener Hitze. In heissem Fett verdunstet ebenfalls das Wasser der äusseren Zellen worauf das Herausbacken aus Fett beruht. Backt man schwimmend aus Fett heraus, so bildet sich sofort eine Kruste um das ganze Stück, so dass kein Fett weiter eindringen kann. Die Speisen werden beim Garkochen in Fett durch das Eindringen desselben in ihrem Nährwert erhöht.

Veränderung des Nährwertes der Speisen beim Garkochen in:

| | | | |
|---|---|---|---|
| Wasser viel Verlust | Dampf wenig Verlust | Luft fast kein Verlust | Fett Gewinn |
|  |  |  |  |

Der Gasverbrauch GmbH
Abt. Außendienst
Berlin 1929

Chemie des Kochens. III

M 131

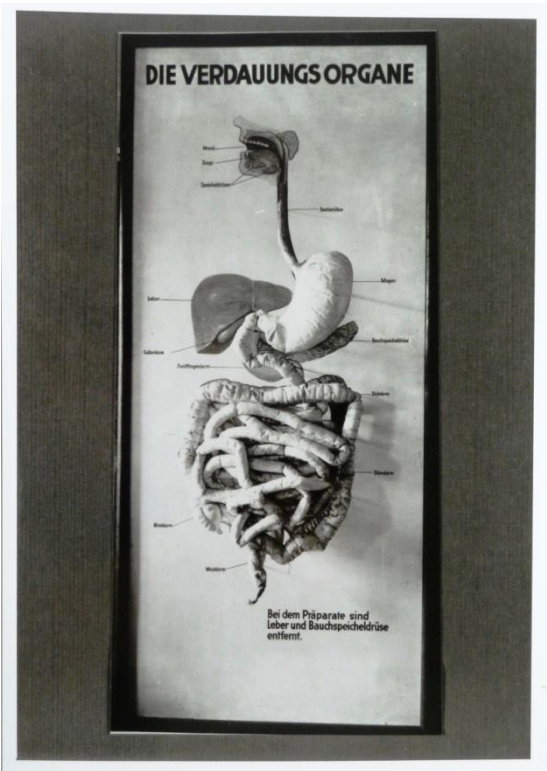
A.15. “The Chemistry of Cooking III.” Steam cooked foods without leeching their nutrients. Hot air and fat steamed the water of the outer cells, creating a tasty, crunchy outer layer. Fried foods’ nutritional value supposedly increased as they soaked up the cooking fat. This poster evinces a curious combination of quantitative nutrition (more

calories is good) and qualitative nutrition (how foods are prepared affects their nutritional content).

⁹⁸² M130 and M131, Musterbuch für Lehrtafeln, DHMD 2002/1866, DHMD Archiv, Dresden. These are drafts for posters presumably used for the “Nutrition” exhibition in Berlin in 1928 and “Proper Nutrition” in 1928-1929.

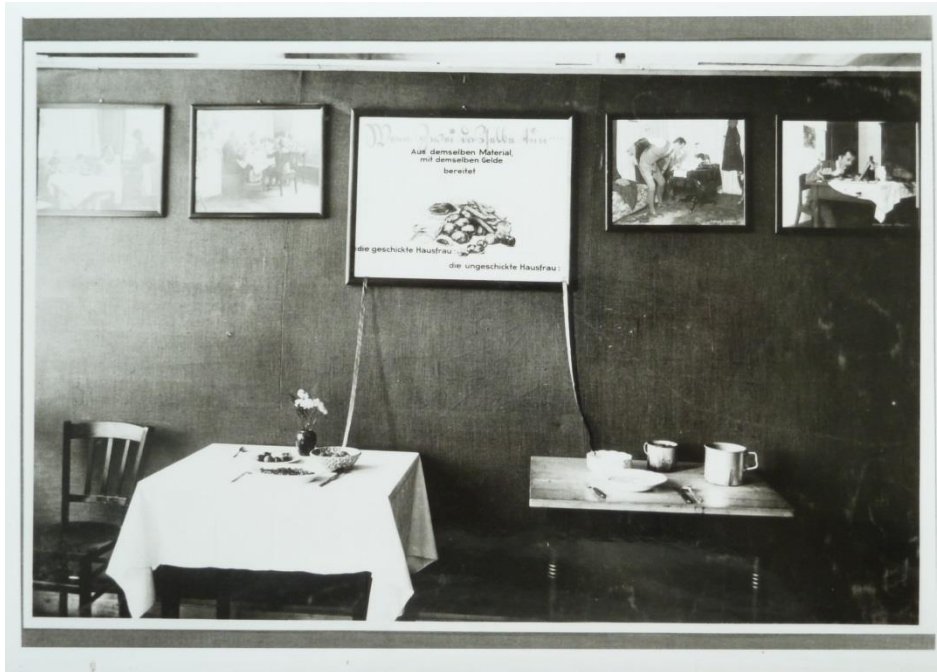


A.16 “Where Does the Body Process Food?” Displays from the traveling “Proper Nutrition” exhibition, Leipzig (1929).⁹⁸³



A.17. “The Digestive Organs.” Liver and pancreas not included.

⁹⁸³ Photos 13 and 20, Wanderausstellung Richtige Ernährung, Leipzig (1928), DHMD 2009/628.1-32, DHMD Archiv, Dresden.



A.18. “When Two Do the Same Thing: [Meals] made from the same things for the same amount of money. The talented housewife, the untalented housewife.” On the left, a properly set table with chair, white cloth, and flowers holds an aesthetically pleasing and appetizing meal.

On the right, a bare table sans chair and with mismatched tableware offers an unappetizing meal. The two photos hanging on the left depict pleasant scenes around the family table. The two on the right feature men trying to eat while dressing or reading. Scarfing a hasty meal was frequently derided as a bad American habit. Socially enjoyable meals were thought to encourage good digestive physiology.⁹⁸⁴



A.19. “Vegetarians as Victors in Endurance Marches. In 10 marches (1908-1912) there were 80 vegetarians among 965 participants. 32 vegetarians won prizes (1st-8th place).” The figures wearing light-colored shirts represent vegetarians and those wearing dark tops are meat-eaters. First place is at the front of the pack (to the left).

⁹⁸⁴ Photos 7 and 16, Wanderausstellung Richtige Ernährung, Leipzig (1928), DHMD 2009/628.1-32, DHMD Archiv, Dresden.

Bibliography

Libraries and Archives

Bayerische Staatsbibliothek, Munich
Bundesarchiv-Filmarchiv, Berlin-Wilmersdorf
Deutsches Hygiene-Museum Dresden (DHMD) Archiv und Bibliothek
Deutsche Nationalbibliothek, Leipzig
Dortmund Kochbuchmuseum und Bibliothek
Hathi Trust Digital Library, <http://www.hathitrust.org/>
Institut für Geschichte der Medizin, Technische Universität Dresden
Institut für Sächsische Geschichte und Volkskunde, Dresden. Also their Digitales Historisches Ortsverzeichnis von Sachsen, <http://hov.isgv.de/>; and Sächsische Biografie, <http://saebi.isgv.de/>
Lebendiges virtuelles Museum Online (LeMO), <http://www.dhm.de/lemo/home.html>
Geheimes Staatsarchiv Preußischer Kulturbesitz (GstA-PK), Berlin-Dahlem
Preußischer Staatskommissar für Volksernährung, MdI I. HA, Rep. 197 A
Sächsisches Hauptstaatsarchiv Dresden (SHAD)
Ministerium des Innern (MdI), 2.3.3.1.10736
Ministerium für Wirtschaft (MfW), 2.3.7.1.11168
Deutsches Hygiene-Museum Dresden (DHMD), 4.2.4.13658
Deutsches Hygienemuseum e.V. 1908-1946, 11.3.13686
Personennachlässe Ragnar Berg, 12.3.12650 and Walter Oskar Lohs, 12.13.12728
Sächsische Landesbibliothek – Staats- und Universitätsbibliothek Dresden
Staatsbibliothek zu Berlin, Preußischer Kulturbesitz, Berlin
Stadtarchiv Braunschweig, Ausstellung “Richtige Ernährung,” D IV 4696 b
Stadtarchiv Dresden
Kriegsunterstützungsamt (KUA) 1914-1923, 2.3.26
Lebensmittelkarten 1915-1922, Drucksammlung Gruppe A 256/II, 17.2.1

Periodicals

Archiv für physikalisch-diätetische Therapie in der ärztlichen Praxis (ApdT)
Berliner klinische Wochenschrift (BkW)
Bulletin of the US Department of Agriculture Office of Research Stations
Bulletin of the International Association of Medical Museums (BIAMM)
Chemiker-Zeitung (Chem.-Ztg.)
Deutsche medizinische Wochenschrift (DmW)
Deutsches Archiv für klinische Medizin (Dtsch. Arch. klin. Med.)
Deutsches Reichsgesetzblatt (RGBl)
Deutsche Vierteljahresschrift für öffentliche Gesundheitspflege (Öffentliche Gesundheitspflege)
Dresdner Anzeiger (DA)
Dresdner Hausfrau (DH)

Dresdner Hefte

7. Jahrgang, Heft 20: Von der Residenz zur Großstadt—Aspekte kultureller Entwicklung von 1871-1918 (May 1989); 18. Jhrg., Heft 61: Industriestadt Dresden? Wirtschaftswachstum im Kaiserreich (Jan. 2000); 20 Jhrg., Heft 70: Großbritannien und Sachsen—Erfahrungen gemeinsamer Kultur (Feb. 2002); 22 Jhrg., Heft 80: Das »Rote Königreich« und sein Monarch (Apr. 2004); 26. Jhrg., Heft 93: Bürgertum und Bürgerlichkeit in Dresden (Jan. 2008)

Dresdner Nachrichten (DN)

Dresdner Neuste Nachricht (DNN)

Hygiene. Sondernummer der Zeitschrift für Desinfektions- und Gesundheitswesen (Hygiene)

Hygienischer Wegweiser (Hyg. Weg.)

Journal of the American Medical Association (JAMA)

Konserven-Industrie

Konserven-Zeitung (Konserven-Ztg)

Leipziger Hausfrau (LH)

Münchner medizinische Wochenschrift (MmW)

Reichs-Medizinal-Kalender für Deutschland (RMKD)

Sächsische landwirtschaftliche Zeitschrift (SIZ)

Simplicissimus

Statistisches Jahrbuch für das Deutsche Reich

Zeitschrift für angewandte Chemie (Ztschr. angew. Chem.)

Zeitschrift für klinische Medizin (Ztschr. klin. Med.)

Zeitschrift für Ernährung

Zentralblatt für die gesamte Hygiene mit Einschluß der Bakteriologie und Immunitätslehre

Primary Sources

“Germans Impose Mass Death on Red Prisoners and Poles.” *LIFE* (23 Feb. 1942): 26-27. Google eBook.

Albrecht, Egon Erich. *Das Deutsche Hygiene- Museum und sein Internationaler Gesundheitsdienst. Eine Denkschrift*. Dresden: [DHMD], 1931.

Ausstellung “Der Mensch.” Ausgewählte Gruppen aus der Internationalen Hygiene-Ausstellung Dresden 1911. Darmstadt im Grossherzoglichen Residenzschloss. Dresden: Deutsches Hygiene-Museum Dresden Bücherei, 1912.

Bebel, August. *Die Frau in der Vergangenheit, Gegenwart und Zukunft*. Zurich: J. Schabelitz, 1883.

--. *Die Frau und der Sozialismus*. Zürich-Hottingen: Verlag der Volksbuchhandlung, 1879.

Beninde, Max Georg, and Max Rubner. *Hungerblockade und Volksgesundheit*. Berlin: Schoetz, 1920.

Benjamin, Walter. “Bekränzter Eingang: Zur Ausstellung ‘Gesunde Nerven’ im Gesundheitshaus Kreuzberg.” *Die Literarische Welt* 6, no. 2 (10 January 1930). Translated as “Garlanded Entrance: On the ‘Sound Nerves’ Exhibition at the Gesundheitshaus Kreuzberg.” In *The Work of Art in the Age of its Technological Reproducibility, and Other Writings on Media*, by Walter Benjamin, Michael William Jennings, Brigid Doherty, Thomas Y. Levin, and E.F.N. Jephcott, 60-66. Cambridge, MA: Belknap Press of Harvard University Press, 2008.

- . "Jahrmarkt des Essens: Epilog zur Berliner Ernährungsausstellung." In *Gesammelte Schriften*, edited by Rolf Tiedemann and Hermann Schweppenhäuser, vol. IV, part 1, edited by Tillman Rexroth, 527-532. Frankfurt am Main: Suhrkamp Verlag, 1972. Translated as "Food Fair: Epilogue to the Berlin Food Exhibition." In *Walter Benjamin. Selected Writings*, edited by Michael W. Jennings, vol. 2 1917-1934, edited by Michael W. Jennings, Howard Eiland, and Gary Smith, translated by Rodney Livingstone and Others, 135-140. Cambridge, MA: Belknap Press of Harvard University Press, 1999.
- Berg, Ragnar. *Alltägliche Wunder*. 2. Auflage. Dresden: Emil Pahl, 1924.
- . *Der Einfluß des Abbrühens auf den Nährwert unserer Gemüsekost*. Blasewitz: Elbgau-Buchdruckerei, 1911.
- . *Eiweissbedarf und Mineralstoffwechsel bei einfachster Ernährung*. Leipzig: Hirzel, 1931.
- . *Die Nahrungs- und Genußmittel, ihre Zusammensetzung und ihr Einfluß auf die Gesundheit, mit besonderer Berücksichtigung der Aschenbestandteile*. Dresden: Holze & Pahl, 1913.
- . *Die Nahrungs- und Genußmittel, ihre Zusammensetzung und ihr Einfluß auf die Gesundheit, mit besonderer Berücksichtigung der Aschenbestandteile*. 2. Auflage. Dresden: Emil Pahl, 1923.
- Berg, Ragnar, and Martin Vogel. *Die Grundlagen einer richtigen Ernährung*. 1-7. Auflagen. Leben und Gesundheit, Gemeinverständliche Schriftenreihe, herausgegeben von Deutsches Hygiene-Museum, Serie Band 5/6. Dresden: Deutscher Verlag für Volkswohlfahrt, 1925-1930.
- Bilz, Friedrich Eduard. *Das neue Naturheilverfahren. Lehr- und Nachschlagbuch der naturgemäßen Heilweise und Gesundheitspflege*. 93. Auflage. Leipzig: Friedrich Eduard Bilz & Frankenstein & Wagner in Leipzig, [c. 1900].
- Binding, Karl, and Alfred Hoche. *Die Freigabe der Vernichtung Lebensunwerten Lebens, ihr Mass und ihre Form*. Leipzig: Felix Meiner, 1920.
- Boeke, Kees. *Cosmic View: The Universe in 40 Jumps*. New York: J. Day, 1957.
- Boer, Elisabeth. *Chronik des Kurorts Weisser-Hirsch. Von den Anfängen bis zur Eingemeindung*. Arbeiten aus dem Ratsarchiv und der Stadtbibliothek zu Dresden, edited by Georg Hermann Müller, Band 6. Dresden: Wilhelm und Bertha v. Baensch Stiftung, 1932.
- Brailsford, Henry Noel. *Across the Blockade: A Record of Travels in Enemy Europe*. New York: Harcourt, Brace & Howe, 1919.
- Brillat-Savarin, Jean Anthelme. *Physiologie du gout, ou Méditations de gastronomie transcendante: ouvrage théorique, historique et à l'ordre du jour*. Paris: Charpentier, 1847.
- Buchinger, Otto. *Das Heilfasten und seine Hilfsmethoden*. Stuttgart: Hippokrates, 1935.
- Bumm, Franz, and Rudolf Abel. *Deutschlands Gesundheitsverhältnisse unter dem Einfluss des Weltkrieges*. 2 vols. Stuttgart: Deutsche Verlags-Anstalt, 1928.
- Bunge, Gustav von. "Über die Bedeutung des Kochsalzes und das Verhalten der Kalisalze im menschlichen Organismus." Magister-Arbeit, University of Dorpat, 1873.
- . "Der Kali-, Natron- und Chlorgehalt der Milch, verglichen mit dem anderer Nahrungsmittel und des Gesamtorganismus der Säugetiere." Dissertation, University of Dorpat, 1874.
- Calwer, Richard. *Das Wirtschaftsjahr Jahresberichte über den Wirtschafts- und Arbeitsmarkt Teil 2, Jahrbuch der Weltwirtschaft*. Jena: Fischer, 1903-1916.
- Cannon Walter, B., and Ernest A. Moser. "The Movements of the Food in the Esophagus." *American Journal of Physiology* 1 (1898): 435-444.

- Carey, Eben J. *Medical Science Exhibits: A Century of Progress. Chicago World's Fair 1933 and 1934*. [Chicago]: [n.p.], 1936.
- Commission des Verbandes "Arbeiterwohl." *Das häusliche Glück. Vollständiger Haushaltungsunterricht nebst Anleitung zum Kochen für Arbeiterfrauen. Zugleich ein nützliches Hilfsbuch für alle Frauen und Mädchen, die billig und gut haushalten lernen wollen. Mit Interviews aus Arbeiterfamilien*. 11. verbesserte Auflage. M. Gladbach und Leipzig: A. Riffarth, 1882. Facsimile edited by Richard Blank. Munich: Rogner & Bernhard, 1975.
- Cooper, Ethel. *Behind the Lines: One Woman's War 1914-18. The Letters of Caroline Ethel Cooper*, edited by Decie Denholm. London: Jill Norman & Hobhouse, 1982.
- Daukes, Sidney Herbert. *The Medical Museum: Modern Developments, Organisation and Technical Methods, Based on a New System of Visual Teaching*. London: Wellcome Foundation, 1929.
- Davidis, Henriette, and Ida Schulze. *Das neue Kochbuch für die deutsche Küche*. 3. Auflage. Bielefeld und Leipzig: Verlag von Velhagen und Klasing, 1935.
- Davidis, Henriette, and Luise Holle. *Praktisches Kochbuch für gewöhnliche und feinere Küche. Unter besonderer Berücksichtigung der Anfängerinnen und angehenden Hausfrauen*. 39. Auflage. Bielefeld & Leipzig: Velhagen & Klasing, 1901.
- . *Praktisches Kochbuch für die einfache und feinere Küche*. 60. Auflage. Bielefeld & Leipzig: Velhagen & Klasing, 1935.
- De Toledo, Françoise Wilhelmi, and Hubert Hohler. *Buchinger Heilfasten. Die Originalmethode*. Stuttgart: Trias, 2010.
- Deutsches Hygiene-Museum Dresden. *50 Jahre Deutsches Hygiene Museum Dresden*. Dresden: Landesdruckerei, 1962.
- . *Führer durch das Deutsche Hygiene-Museum Dresden, mit einem Vorwort über die Internationale Hygiene-Ausstellung*. Dresden: Scholz & Co., 1930.
- . *Das National-Hygiene-Museum in Dresden in den Jahren 1912-1918*. Dresden: C.C. Minhold & Söhne, 1919.
- Deutsches Hygiene-Museum Dresden and Jahresschau deutscher Arbeit. *Hygiene Ausstellung Dresden 1930*. Dresden: Verlag der Internationalen-Hygiene Ausstellung 1930, [1929].
- Dienemann, Franz. *Ein Beitrag zur Kasuistik der arteriell-venösen Aneurysmen*. Medical Dissertation, Friedrich-Alexander University, Erlangen. Erlangen: A. Vollrath's k. b. Hofbruck, 1892.
- . *Briefe eines Arztes über Ernährung an einen Laien*. 1. and 2. Auflage. Jena: Gustav Fischer, 1918.
- . "Die einheitliche Regelung der Krankenernährung im Reich." *Deutsche medizinische Wochenschrift* 43:1, no. 18 (3 May 1917): 558-561.
- . "Für die Jugendlichen!" *Soziale Praxis und Archiv für Volkswohlfahrt* 26, no. 52 (27 September 1917): 997-1000.
- . *Die gesundheitlichen Grundlagen für gewerbliche Arbeit und Taylorsystem*. Veröffentlichungen der Dresdner Volkshochschule, Heft 4. Dresden: Heinrich, 1920.
- . "Hygienische Kriegsmaßnahmen deutscher Städte. 8. Dresden." *Öffentliche Gesundheitspflege* 3, no. 12 ([December] 1918): 401-419.
- . "Ueber die Ernährung der Kranken im Kriege und ihre Grundlagen." *Deutsche medizinische Wochenschrift* 43, no. 13 (29 March 1917): 394-395.
- Döhling, Friedrich. *Das Problem der Massenspeisung und die Massenspeisungsbewegung in Deutschland, im Speziellen in München*. Munich: M. Steinebach, 1918.

- Donne, John. *John Donne's Devotions upon Emergent Occasions. Together with Death's Duel*. Ann Arbor: University of Michigan Press, 1959, 1624.
- Dornblüth, Otto. *Kochbuch für Kranke*. Leipzig: H. Hartung & Sohn, 1897.
- . *Diätetisches Kochbuch*. 2. Auflage. Würzburg: A. Stubers & Curt Kabitzsch, 1905.
- Dornblüth, Otto, and Hedwig Dornblüth. *Diätetisches Kochbuch*. 3. Auflage. Würzburg: Curt Kabitzsch, 1913.
- Dornblüth, Otto, Hedwig Dornblüth, and Karl von Noorden. *Diätetisches Kochbuch*. 4. Auflage. Leipzig: Curt Kabitzsch, 1927.
- Doty, Madeleine Zabriskie. *Short Rations: An American Woman in Germany, 1915...1916*. New York: The Century Co., 1917. Available from Internet Archive.
- Durkheim, Emile. *The Division of Labor in Society*. Translated by W. D. Halls. New York: Free Press, 1997, 1893.
- Eames, Charles, and Ray Eames. *Powers of Ten*. Santa Monica, CA: Pyramid Films, 1977. 9:01 mins. Available online at Powers of Ten: <http://www.powersof10.com/film>.
- Eltzbacher, Paul, ed. *Die deutsche Volksernährung und der englische Aushungerungsplan*. Braunschweig: Friedrich Vieweg & Sohn, 1914.
- Emmel, Johanna. *Die Massenspeisungen im Weltkrieg*. Apolda: Apoldaer Volkszeitung, 1919. Dissertation, Julius-Maximilians-University, Würzburg.
- Engelhardt, Elisabeth. *Die Zentralization der städtischen Haushaltungen: Das Problem der Massenspeisung der Städte*. 1. Auflage. Munich: Summer 1916. 2. Auflage. Munich: "Glaube und Kunst" Parcus & Co., 1917.
- Erzberger, Matthias. *Erlebnisse im Weltkrieg*. Stuttgart: Deutsche Verlagsanstalt, 1920.
- . *Schädigung der deutschen Volkskraft durch die feindliche Blockade. Denkschrift des Reichsgesundheitsamtes, Dezember 1918*. Berlin: Gerhard Stalling, 1919.
- Fischer-Defoy, Werner. "Der Film im Dienste der hygienischen Aufklärung." *Öffentliche Gesundheitspflege* Heft 5 (1919): 145-152.
- Fischer-Dückelmann, Anna. *Die Frau als Hausärztin*. Zweite vermehrte und verbesserte Jubiläums-Pracht-Ausgabe (290. bis 310. Tausend). Stuttgart: Süddeutsches Verlags-Institut, [1907?].
- Garms, Hans, and Max Reach. *Verdauungsstörungen. Ursachen und Abhilfe*. Thalysia-Ratgeber Nr. 8. Leipzig: Thalysia Paul Garms, [1929?].
- Garms, Hans, and Max Reach. *Wasserstauung und Zuckerüberschwemmung im Menschen. Gemeinverständlicher Ratgeber für Nieren-, Blasen- und Zuckerkrankte*. Thalysia-Ratgeber Nr. 12. Leipzig: Thalysia Paul Garms, [1929?].
- Gebhard, Bruno. *Im Strom und Gegenstrom, 1919-1937*. Beiträge zur Geschichte der Wissenschaft und der Technik. Heft 14. Veröffentlichung der Deutschen Gesellschaft für Geschichte der Medizin, Naturwissenschaft und Technik. Wiesbaden: Franz Steiner, 1976.
- Grotjahn, Alfred. "Fünfundzwanzig Jahre Soziale Hygiene. Rückblick und Ausblick." *Archiv für Soziale Hygiene und Demographie* Neue Folge, 5 (1930): 181-183.
- Gumpert, Martin. *Heil Hunger! Health under Hitler*. Translated by Maurice Samuel. New York: Alliance Book Corporation; Longmans, Green & Co., 1940.
- Hartmann, Fritz. *Die Heeresverpflegung*, Heft 11 of *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftliche Abteilung der Kriegsernährungsamts. Berlin: Reimar Hobbing, early May 1917.

- Heartfield, John. "Hurrah, die Butter ist alle!" *Arbeiter-Illustrierte-Zeitung* (19 Dezember 1935): cover. Republished at John Heartfield, Dada Photomonteur: Official Internet Archive. Accessed 29 June 2013. <http://www.johnheartfield.com/JOHN-HEARTFIELD-ART/MONTAGE/heartfield-hurray-butter-gone.html>.
- Heyl, Hedwig. *Das ABC der Küche*. 14 Auflagen. Berlin: Carl Habel, 1888-1938.
- . *Diätküche*. Berlin: Carl Habel, 1929.
- . *Die Krankenkost*. Berlin: Carl Habel, 1889.
- Hiemer, Ernst. *Der Giftpilz*. Nürnberg: Stürmer Verlag, 1938.
- Hindhede, Mikkel. "The Effect of Food Restriction during War on Mortality in Copenhagen." *JAMA* 74, no. 6 (7 February 1920): 381-382.
- Huch, Arthur. Improvements in or relating to the Manufacture of Preserved Foods. British Patent 239,260, filed 29 Feb. 1924, and issued 31 Aug. 1925
- . Process of preserving fruits or vegetables. US Patent 909,600, filed 22 July 1907, and issued 12 Jan. 1909. Published in *Official Gazette of the United States Patent Office*, vol. 138, no. 2 (12 Jan. 1909): 418.
- . Verfahren zur Herstellung in Dampf gekochter Konserven, German Patent 200,182, filed 28 July 1906, and issued 9 July 1908.
- Huch, Arthur, and Hermann Serger. Procédé pour préparer les conserves. French Patent 576,243, filed 24 January 1924, and issued 8 May 1924.
- . Verfahren zur Herstellung von Dauerkonserven. German Patent 418,416, issued 24 August 1922.
- Ilberg, Georg. "Die Sterblichkeit der Geisteskranken in den sächsischen Anstalten während des Krieges." *Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medizin* 78, no. 1/2 (1922): 58-63.
- Internationale Hygiene-Ausstellung Dresden. Amtlicher Führer*. Dresden: Verlag der Internationalen Hygiene-Ausstellung, 1930.
- Jahresschau Deutscher Arbeit. *Amtlicher Führer*. 8 vols. Dresden: Verlag der Jahresschau Deutscher Arbeit, 1922-1929.
- König, Joseph, Adolf Schmidt, and Emil Abderhalden. *Sonder-Kataloge der Gruppe Ernährungslehre der Internationalen Hygiene-Ausstellung Dresden 1911*. Dresden: Verlag der Internationalen-Hygiene Ausstellung, 1911.
- Krehl, Ludolf, ed. *Lehrbuch der inneren Medizin*. 14. durchgesehene und verbesserte Auflage. 2 vols. Jena: Gustav Fischer, 1922.
- . *Lehrbuch der inneren Medizin*. 7. Auflage. Jena: Gustav Fischer, 1911.
- Krüger, Hans. "Dresdens Lebensmittelverwaltung." In *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 7/8: Die Nahrungsmittel-wirtschaft großer Städte im Kriege, 49-75. Berlin: Reimar Hobbing, 3 March 1917.
- . "Die Massenspeisung." In *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 1-31. Berlin: Reimar Hobbing, mid May 1917.
- Lahmann, Heinrich. *Die diätetische Blutentmischung (Dysämie) als Grundursache aller Krankheiten*. 9. Auflage. Leipzig: Otto Spamer, 1899.
- . *Natural Hygiene, or Healthy Blood*. Swan Sonnenschein & Co, 1898. Google eBook.
- . *Die wichtigsten Kapitel der natürlichen (physikalisch-diätetischen) Heilweise*. 2. Auflage der *Physiatischen Blätter*. Stuttgart: A. Zimmer's (Ernst Mohrmann), 1894.

- Landesgesundheitsamt Sachsen. *Dritter Jahresbericht des Landes-Gesundheitsamtes über das Gesundheitswesen in Sachsen auf die Jahre 1914-1918*. Dresden: [Vogel], 1921.
- Leyden, Ernst von. *Handbuch der Ernährungstherapie und Diätetik*. 1. Auflage. 2 vols. Leipzig: Georg Thieme, 1897-1898.
- Leyden, Ernst von, and Georg Klemperer. *Handbuch der Ernährungstherapie und Diätetik*. 2. umgearbeitete Auflage. 2 vols. Leipzig: Georg Thieme, 1903-1904.
- Liebig, Justus, and John Gardner. *Familiar Letters on Chemistry, and its Relation to Commerce, Physiology and Agriculture*. New York: J. Winchester, 1843.
- Liebig Company's Fleisch-Extract in der bürgerlichen Küche: eine Sammlung erprobter einfacher Recepte von der Herausgeberin des Kochbuches von Henriette Davidis mit einem Anhang von Recepten für Krankenkost unter Verwendung des Fleisch-Peptons der Compagnie Liebig*. N.p.: [Selbstverlag], 1875. Projekt: Bibliotheca Gastronomica, <http://digital.slub-dresden.de/id312383088>.
- Lingner, Karl August. *Denkschrift zur Errichtung eines National-Hygiene-Museums in Dresden*. Dresden: n.p., March 1912.
- . "Einige Leitgedanken zu der Sonderausstellung. Volkskrankheiten und ihre Bekämpfung." In *Die deutschen Städte. geschildert nach den Ergebnissen der ersten deutschen Städteausstellung zu Dresden 1903*, edited by Robert Wuttke. Vol. 1, 531-547. Leipzig: Friedrich Brandstetter, 1904.
- . "Der Mensch als Organisationsvorbild." *Annalen der Natur- und Kulturphilosophie* 13, no. 1 (1917): 15-37.
- . *Der Mensch als Organisations-Vorbild; Gastvortrag gehalten am 14. Dezember 1912 vor dem Professorenkollegium der Universität Bern*. Bern: M. Drechsel, 1914.
- . "Volkskrankheiten und ihre Bekämpfung." In *Die deutschen Städte. geschildert nach den Ergebnissen der ersten deutschen Städteausstellung zu Dresden 1903*, edited by Robert Wuttke, 318-319. Vol. 2 Abbildungen. Leipzig: Friedrich Brandstetter, 1904.
- Lusk, Graham. *The Elements of the Science of Nutrition*. Philadelphia: W. B. Saunders, 1906.
- Martens, Anna. *Ernährungskuren für Kranke und solche, die gesund bleiben wollen*. Trogen, Schweiz: Hygiea-Verlag, 1923.
- McCollum, Elmer Verner. *The Newer Knowledge of Nutrition: The Use of Food for the Preservation of Vitality and Health*. New York: Macmillan, 1918.
- Mering, Josef, ed. *Lehrbuch der inneren Medizin*. 1. Auflage. Jena: Gustav Fischer, 1901.
- Möller, Siegfried. *Das diätetische Heilverfahren Schroths*. 5. Auflage. Dresden: H. Dittmar, 1910.
- Morrison, Philip, and Phylis Morrison. *Powers of Ten: A Book about the Relative Size of Things in the Universe and the Effect of Adding Another Zero*. New York: Scientific American Library, 1982.
- Münsterberg, Hugo. *Tomorrow. Letters to a Friend in Germany*. New York: D. Appleton, 1916.
- Nachrichtendienst des Kriegsernährungsamts. *Deutsche Ernährungswirtschaft im Kriege (Vortragsstoff)*. Leipzig: n.p., [1917?].
- Nordau, Max Simon. *The Conventional Lies of Our Civilization*. Chicago: L. Schick, 1884. Originally published as *Die Conventionalen Lügen der Kulturmenscheit*. Leipzig: B. Schlicke, 1883.
- Offizieller Führer durch die Internationale Hygiene-Ausstellung Dresden 1911 und durch Dresden und Umgebung*. Berlin: Rudolf Mosse, [1911].

- Offizieller Katalog der Internationalen Hygiene Ausstellung Dresden Mai bis Oktober 1911*. Neu verbesserte Auflage. Berlin: Rudolf Mosse, 1911.
- Pfeifer, Magdalene. *Sächsisches Kriegskochbuch für ländliche Verhältnisse: Anleitung zur Herstellung einer einfachen, billigen und nahrhaften Kost*. 3. Auflage. Dresden: Landeskulturrat für das Königreich Sachsen, 1915.
- . *Die Volksküche: Winke für die Einrichtung, den Betrieb und das Kochen nebst Kochvorschriften für 50 Gerichte*. [Dresden]: [Landeskulturrat für das Königreich Sachsen], 1916.
- Pleißner, Maximilian. *Sonderkatalog für die Gruppe Pflanzliche Lebensmittel und Lebensmittel-Untersuchung der wissenschaftlichen Abteilung der Internationalen Hygiene-Ausstellung Dresden 1911*. Dresden: Verlag der Internationalen-Hygiene Ausstellung, 1911.
- Prato, Katharina. *Die Süddeutsche Küche auf ihrem gegenwärtigen Standpunkte mit Berücksichtigung des Thee's und einem Anhang über das moderne Servieren. Für Anfängerinnen sowie praktische Köchinnen*. 7. verbesserte Auflage. Graz: August Hesse's Buchhandlung / August Zimmermann, 1885.
- Presse- u. Werbe Abteilung des Ausstellungs-, Messe- und Fremdenverkehrsamtes der Stadt Berlin, ed. *Die Ernährung: Ausstellung für gesunde und zweckmässige Ernährung*. Berlin: Gersbach & Sohn, 1928.
- Reicke, Ilse. "Die erste Hausfrau Deutschlands. Zum 80. Geburtstag von Dr. h. c. Hedwig Heyl am 5. Mai 1930." *Dresdner Nachricht* 230 (1 May 1930): 8.
- Reicke, Ilse, and Hedwig Heyl. *Das tätige Herz. Ein Lebensbild Hedwig Heyls*. Deutsches Frauenschaften, Heft 3. Leipzig: Herrmann Eichblatt, 1938.
- Richter, Alfred, and Helene Richter. *Fleischlose Kost. Praktische Winke*. 5. Auflage. Dresden: Naturheilinstitut Alfred Richter, 1931 [actually after 1933].
- Rubner, Max. *Gesetze des Energieverbrauchs bei der Ernährung*. Leipzig: F. Deuticke, 1902.
- . *The Laws of Energy Consumption in Nutrition*. Translated by Allan Markoff and Alex Sandri-White, edited by Robert J. T. Joy. Natick, MA: US Army Research Institute of Environmental Medicine, 1968.
- , et alia. *The Starving of Germany. Papers Read at Extraordinary Meeting of United Medical Societies Held at Headquarters of Berlin Medical Society, Berlin, December 18th 1918*. Berlin: L. Schumacher, 1919.
- . "Untersuchungen über Vollkornbrote." *Archiv für Physiologie* (1917): 245-372.
- . *Volksernährungsfragen*. Leipzig: Akademische Verlagsgesellschaft, 1908.
- . *Wandlungen in der Volksernährung*. Leipzig: Akademische Verlagsgesellschaft, 1913.
- Rühle, Otto. *Illustrierte Kultur- und Sittengeschichte des Proletariats*. 2 vols. Berlin: Neuer Deutscher Verlag, 1930.
- Salkowski, Ernst. "Untersuchungen über die Ausscheidung der Alkalisalze." *Virchows Archiv für pathologische Anatomie* 53, no. 2/3 (1871): 209-234.
- Schacht, Franz. "Die physiologischen Lehren der jetzigen Volksernährung." *Zeitschrift für physikalische und diätetische Therapie* 21, no. 10 (1917): 296-306.
- Schade, Alwein. "Veränderungen im Mitgliederbestande 1937/38: Franz Dienemann." In *Sitzungsberichte und Abhandlungen der Naturwissenschaftlichen Gesellschaft ISIS in Dresden. Jahrgang 1938 und 1939*, edited by Alwein Schade, 53-54. Dresden: H. Burdach, 1940.
- Schäfer, Friedrich, ed. *Wissenschaftlicher Führer durch Dresden*. Dresden: Zahn & Jaensch, 1907.

- Scheu, Erwin. "Die Lebensmittelversorgung der sächsischen Großstädte: eine wirtschafts-geographische Studie." *Schlesische Jahrbücher für Geistes- und Naturwissenschaften* 2, no. 3 (1924): 179-208.
- Scheunert, Arthur. "Neuere Forschungsergebnisse über das Verhalten der Vitamine bei der Gemüsekonservierung." *Schriftenreihe der Fachgruppe Obst- und Gemüseverwertungsindustrie*. Berichte und Vorträge über die wissenschaftlich-technische Tagung der Konservenindustrie in Braunschweig vom 26. und 27. Januar 1939. Heft 3 (1939): 70-82.
- Schilling, Johann Friedrich Wilhelm. *Die Verdaulichkeit der Nahrungs- und Genußmittel auf Grund mikroskopischer Untersuchungen der Faeces*. Leipzig: Hartwig und Sohn, 1901.
- Schlegel, Werner. *Die Lebensmittelversorgung der Stadt Leipzig während der Kriegs- und Nachkriegsjahre 1914-1924*. Inaugural-Dissertation, University of Leipzig, 1930.
- Schmidt, Friedrich. "Artamanenbewegung und Politik." *Die Kommenden* (27 July 1927): 355.
- Schuman, Frederick L. "The Third Reich's Road to War." *Annals of the American Academy of Political and Social Science* vol. 175: The Shadow of War (September 1934): 33-43.
- Seiring, Georg. *The Central Institution for Public Hygiene*. Dresden: Deutsches Hygiene-Museum, 1928.
- . *Das Zentralinstitut für Volksgesundheitspflege*. Dresden: Deutsches Hygiene-Museum, 1927.
- Seiring, Georg, and Marta Fraenkel, eds. *10 Jahre Dresdner Ausstellungsarbeit: Jahresschauen deutscher Arbeit 1922-1929 und Internationale Hygiene-Ausstellung 1930/31*. Dresden: Verlag der Internationalen Hygiene-Ausstellung 1930/31, 1931.
- Simmel, Georg. "The Metropolis and Mental Life." In *The Blackwell City Reader*, edited by Gary Bridge and Sophie Watson, 11-19. Malden, MA: Wiley-Blackwell, 2002.
- Skalweit, August. *Die deutsche Kriegsernährungswirtschaft*. Veröffentlichungen der Carnegie-Stiftung für Internationalen Frieden. Abteilung für Volkswirtschaft und Geschichte. New Haven: Yale University Press, 1927.
- . "Kommunale Ernährungspolitik." In *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 7/8: Die Nahrungsmittelwirtschaft großer Städte im Kriege, 1-48. Berlin: Reimar Hobbing, 3 March 1917.
- Spalteholz, Werner. *Über das Durchsichtigmachen von Praeparaten*. 2. Auflage. Leipzig: S. Hirzel, 1914.
- Starker, Elise. *Hygienisches Kochbuch zum Gebrauch für ehemalige Curgäste von Dr. Lahmann's Sanatorium auf Weisser Hirsch bei Dresden*. 2. Auflage. Dresden: Alexander Köhler, 1893.
- . *Hygienisches Kochbuch zum Gebrauch für ehemalige Curgäste von Dr. Lahmann's Sanatorium auf Weisser Hirsch bei Dresden*. 16. Auflage. Dresden: Alexander Köhler, 1905.
- Starrmann-Hunger, Margarete. *Sachsen: Untersuchungen über die wirtschaftlichen, sozialen und gesundheitlichen Zustände der Bevölkerung*. Dresden: Teubner, 1924.
- Stegerwald, Adam. "Zur Schwer- und Schwerstarbeiter-Versorgung mit Zusatzlebensmitteln." In *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 26/27: Die Schwerarbeiterfrage, 1-10. Berlin: Reimar Hobbing, early December 1917.
- Stegerwald, Adam, Richard Lenz, and Lucas Wiernick. *Die Schwerarbeiterfrage*. Heft 26/27 of *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts. Berlin: Reimar Hobbing, early December 1917.

- Stein, Philipp. "Der Besuch der Massenspeisungen und die Lage der Lebensmittelversorgung." *Beiträge zur kommunalen Kriegswirtschaft* 2, no. 30 (20 June 1918): 349-353.
- Störmer, Alfred. "Fünfzig Jahre Dr. Lahmann's Sanatorium 'Weisser Hirsch.'" *Ärzteblatt für Mitteldeutschland* 72 (1938): 84-85.
- Schuman, Frederick L. "The Road to Hitler." *The New Republic* (Sept. 1934): 33-43.
- Temper, Dr. *Rechnungsabschluß über das 7. Geschäftsjahr des Lebensmittelamtes 16. August 1920 bis 15. August 1921*. Dresden: Dr. Güntzschen Stiftung, 31 July 1922.
- Tenius, Gustav. "Zur Statistik der Massenspeisungs-Einrichtungen." In *Beiträge zur Kriegswirtschaft*, edited by the Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, Heft 14: Die Massenspeisungen, 32-57. Berlin: Reimar Hobbing, mid May 1917.
- Thomas, Theodor. *Die Massenspeisung in Wort und Bild. Ein Beitrag zur Entwicklung der Frankfurter Kriegsküchen*. Frankfurt am Main: Zentral-Küchenkommission, 1916.
- US Naval War College, ed. "Declaration by German Plenipotentiaries on signing Armistice, November 11, 1918." In *International Law Documents. Neutrality, Conduct and Conclusion of Hostilities with Notes. 1918*. International Law Studies Series vol. 58, 73-74. Washington, DC: Government Printing Office, 1919.
- Vogel, Martin. *Ernährungsführer*. Dresden: Deutscher Verlag für Volkswohlfahrt, 1928.
- Volkswirtschaftlichen Abteilung des Kriegsernährungsamts, ed. *Beiträge zur Kriegswirtschaft*. 33 Hefte. Berlin: Reimar Hobbing Verlag, 1916-1917.
- , ed. *Hauptergebnisse der Volks-zählung im Deutschen Reich am 5. Dezember 1917*. Berlin: Reichsdruckerei, 1918.
- Wiel, Josef. *Diätetisches Koch-Buch mit besonderer Rücksicht auf den Tisch für Magenkranke*. 6. Auflage. Freiburg im Breisgau: Wanger, 1886.
- Wirz, Franz. "Nationalsozialistische Forderungen an die Volksernährung." *Die Ernährung* 1, no. 3 (1936): 103-112.
- Wolff, Julius Ferdinand. *Lingner und sein Vermächtnis*. Hellerau: Hegner, 1930.
- Zentralstelle für Volkswohlfahrt. *Praktische Durchführung von Massenspeisungen*. Außerordentliche Tagung der Zentralstelle für Volkswohlfahrt in Gemeinschaft mit dem Zentralverein für das Wohl der arbeitenden Klassen im Reichstagssitzungssaal zu Berlin vom 3. bis 4. Juli 1916. Berlin: Carl Heymann, 1916.
- Zerkaulen, Heinrich. *Das Deutsche Hygiene-Museum, Dresden, und seine kulturelle Bedeutung im In- und Ausland*. Dresden: DHMD, 1935.
- , ed. *Das Deutsche Hygiene-Museum: Festschrift zur Eröffnung des Museums und der Internationalen Hygiene-Ausstellung Dresden*. Dresden: Wolfgang Jess, 1930.
- Zum Gedächtnis von Karl August Lingner: Gest. am 5. Juni, 1916*. Dresden: Lingner-Werke, 1926.

Secondary Sources

- Agatston, Arthur. "Why America is Fatter and Sicker Than Ever." *Circulation* 126, 1 (3 July 2012): e3-e5.
- Allen, Keith R. *Hungrige Metropole: Essen, Wohlfahrt und Kommerz in Berlin*. Hamburg: Ergebnisse, 2002.
- . "Sharing Scarcity: Bread Rationing and the First World War in Berlin, 1914-1923." *Journal of Social History* 32, no. 2 (Winter 1998): 371-393.

- Anderlik, Heidemarie, and Leonore Koschnick, eds. *Bilder und Zeugnisse der deutschen Geschichte: aus den Sammlungen des Deutschen Historischen Museums*. Berlin: Deutsches Historisches Museum, 1997.
- Anderson, Benedict. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. London: Verso Editions/NLB, 1983.
- Anderson, Margaret Lavinia. *Practicing Democracy: Elections and Political Culture in Imperial Germany*. Princeton: Princeton University Press, 2000.
- Anker, Suzanne, and Dorothy Nelkin. *The Molecular Gaze: Art in the Genetic Age*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2004.
- Apple, Rima D. *Vitmania: Vitamins in American Culture*. New Brunswick, NJ: Rutgers University Press, 1996.
- Atkins, P. J., Peter Lummel, and Derek J. Oddy, eds. *Food and the City in Europe since 1800*. Aldershot, Eng.: Ashgate, 2007.
- Barlösius, Eva. "Die Küche als soziokulturelles Phänomen." In Katalyse e. V. and Buntstift e. V., *Ernährungskultur im Wandel der Zeiten*, 5-10.
- . *Naturgemässe Lebensführung: zur Geschichte der Lebensreform um die Jahrhundertwende*. Frankfurt am Main: Campus Verlag, 1997.
- . *Soziologie des Essens: Eine sozial- und kulturwissenschaftliche Einführung in die Ernährungsforschung*. 2. Auflage. Weinheim: Juventa, 2011, 1999.
- . "Vegetarische Kochbücher." In Framke, *Man nehme*, 287-302.
- Barnett, L. Margaret. "'Every Man His Own Physician': Dietetic Fads, 1890-1914." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 155-178.
- Barona, Joseph L. *The Problem of Nutrition: Experimental Science, Public Health and Economy in Europe 1914-1945*. New York: P. I. E. Peter Lang, 2010.
- Baten, Jörg, and Andrea Wagner. "Autarchy, Market Disintegration, and Health: the Mortality and Nutritional Crisis in Nazi Germany 1933-1937." *Economics and Human Biology* 1 (2002): 1-18.
- . "Mangelernährung, Krankheit und Sterblichkeit im NS-Wirtschaftsaufschwung (1933-1937)." *Jahrbuch für Wirtschaftsgeschichte* 1 (2003): 99-123.
- Bauch, Nicholas. "The Extensible Digestive System: Biotechnology at the Battle Creek Sanitarium, 1890-1900." *Cultural Geographies* 18, no. 2 (April 2011): 209-229.
- Baumgartner, Judith. *Ernährungsreform—Antwort auf Industrialisierung und Ernährungswandel. Ernährungsreform als Teil der Lebensreformbewegung am Beispiel der Siedlung und des Unternehmens Eden seit 1893*. Frankfurt am Main: Peter Lang, 1992.
- Bay, Alexander R. *Beriberi in Modern Japan: The Making of a National Disease*. Rochester, NY: University of Rochester Press, 2012.
- Beier, Rosmarie, and Martin Roth, eds. *Der Gläserne Mensch—Eine Sensation*. Stuttgart: Verlag Gerd Hatje, 1990.
- Benison, Saul, A. Clifford Barger, and Elin L. Wolfe. *Walter B. Cannon: The Life and Times of a Young Scientist*. Cambridge, MA: Belknap Press, 1987.
- Benninghaus, Christina. *Die anderen Jugendlichen: Arbeitermädchen in der Weimarer Republik*. Frankfurt am Main: Campus Verlag, 1999.
- Bessel, Richard. *Political Violence and the Rise of Nazism: The Storm Troopers in Eastern Germany, 1925-1934*. New Haven: Yale University Press, 1984.

- Biernacki, Richard. *The Fabrication of Labor in Germany and Britain, 1640-1914*. Berkeley: University of California Press, 1995.
- Blackbourn, David, and Geoff Eley. *The Peculiarities of German History: Bourgeois Society and Politics in Nineteenth-Century Germany*. New York: Oxford University Press, 1984.
- Blimlinger, Eva. "Wenn es um die Wurst geht..." In Pammer, Neiß, and John, *Erfahrung der Moderne*, 385-402.
- Bliss, Michael. *The Discovery of Insulin*. Chicago: University of Chicago Press, 1982.
- Blum, Matthias. "Government Decisions before and during the First World War and the Living Standards in Germany during a Drastic Natural Experiment." *Explorations in Economic History* 48, no. 4 (December 2011): 556-567.
- Bonner, Thomas Neville. *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945*. New York: Oxford University Press, 1995.
- . *To the Ends of the Earth: Women's Search for Education in Medicine*. Cambridge, MA: Harvard University Press, 1992.
- Bonzon, Thierry. "Consumption and Total Warfare in Paris (1914-1918)." In Trentmann and Just, *Food and Conflict*, 49-64.
- Bonzon, Thierry, and Belinda Davis, with Jonathan Manning and Armin Triebel. "Feeding the Cities." In Winter and Robert, *Capital Cities at War*, vol. 1, 305-341.
- Borries, Achim von. *Quiet Helpers: Quaker Service in Postwar Germany*. Edited by Peter Daniels. Translated by John Cary, Cathy Cary, and Hildegard Wright. London: Quaker Home Service and the American Friends Service Committee, 2000.
- Brattig, Patricia, ed. *Femme Fashion, 1780-2004: Die Modellierung des Weiblichen in der Mode = The Modelling of the Female Form in Fashion*. Stuttgart: Arnoldsche, 2003.
- Brauckmann, Stefan. "Artamanen als völkisch-nationalistische Gruppierung innerhalb der deutschen Jugendbewegung 1924-1935." *Jahrbuch des Archivs der deutschen Jugendbewegung* Neu Folge Band 2, no. 5 (2006): 176-196.
- Brecht, Christine. "Schauplätze der Volksgesundheit: Hygieneausstellungen in Kaiserreich und Weimarer Republik." Dissertation, University of Bielefeld, in progress.
- Brecht, Christine, and Sybilla Nikolow. "Displaying the Invisible: Volkskrankheiten on Exhibition in Imperial Germany." *Studies in History and Philosophy of Biological and Biomedical Sciences* 31, no. 4 (2000): 511-530.
- Briesen, Detlef. *Das gesunde Leben: Ernährung und Gesundheit seit dem 18. Jahrhundert*. Frankfurt am Main: Campus Verlag, 2010.
- Bridenthal, Renate, Atina Grossmann, and Marion Kaplan, eds. *When Biology Became Destiny: Women in Weimar and Nazi Germany*. New York: Monthly Review Press, 1984.
- Brock, William H. *Justus von Liebig: The Chemical Gatekeeper*. Cambridge: Cambridge University Press, 1997.
- Brüning, Eberhard. "'Saxony is a Prosperous and Happy Country': American Views of the Kingdom of Saxony in the Nineteenth Century." In *Traveling between Worlds: German-American Encounters*, edited by Thomas Adam and Ruth V. Gross, 20-50. College Station: Texas A&M University Press, 2006.

- Bryant, Thomas. "Der deutsche 'Volkkörper' im Spannungsfeld zwischen 'Volksgesundheit' und 'Volkskrankheit'—Bevölkerungswissenschaftliche Pathologisierungsparadigmen und biopolitische Medikalisierungsstrategien zur demographischen Alterung im 20. Jahrhundert." In *Virus: Beiträge zur Sozialgeschichte der Medizin*, Verein für Sozialgeschichte der Medizin Nr. 9, edited by Carlos Watzka, Elisabeth Dietrich-Daum, and Andreas Golob, 11-24. Vienna: Verlagshaus der Ärzte, 2010.
- . "Von der 'Vergreisung des Volkkörpers' zum 'demographischen Wandel der Gesellschaft'. Geschichte und Gegenwart des deutschen Alterungsdiskurses im 20. Jahrhundert." In *Demographie—Demokratie—Geschichte. Deutschland und Israel*, ed. José Brunner. Bd. 35 of *Tel Aviver Jahrbuch für deutsche Geschichte*, 110-127. Göttingen: Wallstein, 2007.
- Büchi, Walter A. *Karl August Lingner: das grosse Leben des Odolkönigs (1861-1916). Eine Rekonstruktion*. Dresden: Edition Sächsische Zeitung, 2006.
- Budd, Michael Anton. *The Sculpture Machine: Physical Culture and Body Politics in the Age of Empire*. New York: New York University Press, 1997.
- Bynum, William F. *Science and the Practice of Medicine in the Nineteenth Century*. Cambridge: Cambridge University Press, 1994.
- Canning, Kathleen. *Gender History in Practice: Historical Perspectives on Bodies, Class and Citizenship*. Ithaca: Cornell University Press, 2006.
- Cantor, David, Christian Bonah, and Matthias Dörries. *Meat, Medicine, and Human Health in the Twentieth Century*. London: Pickering & Chatto, 2010.
- Carpenter, Kenneth J. *Protein and Energy: A Study of Changing Ideas in Nutrition*. Cambridge: Cambridge University Press, 1994.
- Carpenter, Kenneth J., Alfred E. Harper, and Robert E. Olson. "Experiments that Changed Nutritional Thinking. Proceedings of a Minisymposium. Atlanta, GA, April 1995 and Washington, DC, April 1996." *Journal of Nutrition* 127, 5 Supplement (1 May 1997): 1017S-1053S.
- Cernay, Thomas. "Das Fressprinzip. Wie der Volkkörper sich selbst verdaut." *Informationszentrum Dritte Welt* 253 (2001): 28.
- Chambers, William H. "Max Rubner (June 2, 1854-April 27, 1932)." *Journal of Nutrition* 48, no. 1 (1 Sept. 1952): 1-12.
- Chickering, Roger. *The Great War and Urban Life in Germany, Freiburg, 1914-1918*. New York: Cambridge University Press, 2007.
- Clark, Paul. "The Marketing of Margarine." *Journal of Advertising History* 9, no. 1 (January 1986): 52-65.
- Clarke, Adele E., Janet Shim, Laura Mamo, Jennifer Fosket, and Jennifer Fishman, eds. *Biomedicalization: Technoscience and Transformations of Health and Illness in the U.S.* Durham, NC: Duke University Press, 2009.
- Cocks, Geoffrey Campbell. *The State of Health: Illness in Nazi Germany*. Oxford: Oxford University Press, 2012.
- Cole, Joshua. *The Power of Large Numbers: Population, Politics, and Gender in Nineteenth-century France*. Ithaca: Cornell University Press, 2000.
- Coleman, William. *Death Is a Social Disease: Public Health and Political Economy in Early Industrial France*. Madison: University of Wisconsin Press, 1982.
- . "Koch's Common Bacillus: The First Year." *Bulletin of the History of Medicine* 61 (Fall 1987): 315-342.

- Collingham, Elizabeth M. *The Taste of War: World War Two and the Battle for Food*. London: Allen Lane, 2011.
- Condrau, Flurin. *Lungenheilstalt und Patientenschicksal: Sozialgeschichte der Tuberkulose in Deutschland und England im späten 19. und frühen 20. Jahrhundert*. Göttingen: Vandenhoeck & Ruprecht, 2000.
- Conrad, Peter. *The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders*. Baltimore: Johns Hopkins University Press, 2007.
- Corni, Gustavo, and Horst Gies. *Brot, Butter, Kanonen: die Ernährungswirtschaft in Deutschland unter der Diktatur Hitlers*. Berlin: Akademie Verlag, 1997.
- Cox, Mary Elizabeth. "War, Blockages, and Hunger: Nutritional Deprivation of German Children 1914-1924." *University of Oxford Discussion Papers in Economic and Social History*, Nr. 110 (February 2013).
- Cravens, Hamilton. "The German-American Science of Racial Nutrition, 1870-1920." In *Technical Knowledge in American Culture: Science, Technology, and Medicine since the Early 1800s*, edited by Hamilton Cravens, Alan I. Marcus, and David M. Katzman, 125-145. Tuscaloosa: University of Alabama Press, 1996.
- Davin, Anna. "Imperialism and Motherhood." *History Workshop* 5 (Spring 1978): 9-65.
- Davis, Belinda J. *Home Fires Burning: Food, Politics, and Everyday Life in World War I Berlin*. Chapel Hill: University of North Carolina Press, 2000.
- Deichmann, Ute. "'I Detest His Way of Working.' Leonor Michaelis (1875-1949), Emil Abderhalden (1877-1950), and Jewish and non-Jewish Biochemists in Germany." In *Jews and Sciences in German Contexts*, edited by Ulrich Charpa and Ute Deichmann, 101-126. Tübingen: Mohr Siebeck, 2007.
- De Levie, Robert. "The Henderson Approximation and the Mass Action Law of Guldberg and Waage." *The Chemical Educator* 7, no. 3 (2002): 132-135.
- . "The Henderson-Hasselbalch Equation: Its History and Limitations." *Journal of Chemical Education* 80, no. 2 (2003): 146.
- De Chadarevian, Soraya, and Harmke Kamminga, eds. *Molecularizing Biology and Medicine: New Practices and Alliances, 1910s-1970s*. Studies in the History of Science, Technology, and Medicine, vol. 6. Amsterdam: Harwood Academic Publishers, 1998.
- De Grazia, Victoria. *How Fascism Ruled Women: Italy, 1922-1945*. Berkeley, CA: University of California Press, 1992.
- De Ras, Marion E. P. *Body, Femininity and Nationalism: Girls in the German Youth Movement 1900-1934*. New York: Routledge, 2008.
- De Vries, Jan. "The Industrial Revolution and the Industrious Revolution." *Journal of Economic History* 54, no. 2 (June 1994): 249-270.
- . *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present*. New York: Cambridge University Press, 2008.
- Dewey, Peter. "Nutrition and Living Standards in Wartime Britain." In Wall and Winter, *Upheaval of War*, 917-220.
- Dietze, Matthias. "Reinlich, sauber und gesund!: der menschliche Körper im Spannungsfeld von popularisierter Hygiene und öffentlicher Gesundheitspflege in Dresden 1850 bis 1911." *Dresdener Beiträge zur Geschichte der Technikwissenschaften* 29 (2004): 43-68.
- Dinges, Martin, ed. *Medizinkritische Bewegungen im Deutschen Reich (ca. 1870-ca. 1933)*. Stuttgart: Franz Steiner, 1996.

- Dose, Hanna. "Vorratshaltung und Konservierungsmethoden." In Framke, *Man nehme*, 329-346.
- Drouard, Alain. "Reforming Diet at the End of the Nineteenth Century in Europe." In Atkins, Lummel, and Oddy, *Food and the City in Europe since 1800*, 215-226.
- Duffett, Rachel. "Beyond the Ration: Sharing and Scrounging on the Western Front." *Twentieth Century British History* 22, no. 4 (2001): 453-473.
- . *The Stomach for Fighting: Food and the Soldiers of the Great War*. Manchester, Manchester University Press, 2012.
- Eckart, Wolfgang U. "Öffentliche Gesundheitspflege in der Weimarer Republik und in der Frühgeschichte der Bundesrepublik Deutschland." *Das Öffentliche Gesundheitswesen* 51, no. 5 (1989): 213-221.
- . "Die Vision vom 'gesunden Volkskörper': Seuchenprophylaxe, Sozial- und Rassenhygiene in Deutschland zwischen Kaiserreich und Nationalsozialismus." In Roeßiger and Heidrun Merk, *Hauptsache Gesund!*, 34-47.
- Eckart Wolfgang, U., and Christoph Gradmann, eds. *Die Medizin und der Erste Weltkrieg*. Neuere Medizin- und Wissenschaftsgeschichte, Quellen und Studien, no. 3. Pfaffenweiler, Germany: Centaurus, 1996.
- Elias, Norbert. *The Civilizing Process*. Oxford: Basil Blackwell, 1978. Originally published as *Über den Prozess der Zivilisation. Soziogenetische und psychogenetische Untersuchungen*. 2. Auflage. Bern: Francke, 1969.
- Estes, J. Worth. "Food as Medicine." In *The Cambridge World History of Food*, edited by Kenneth F. Kiple and Kriemhild Coneè Ornelas, 1534-1553. Cambridge, Cambridge University Press, 2000.
- Fairbairn, Brett. "Community Values, Democratic Cultures? Reflections on Saxony's Place in the German Cooperative Movement, 1849-1933." in Retallack, *Saxony in German History*, 180-198.
- Fäßler, Peter. "Sozialhygiene—Rassenhygiene—Euthanasie. 'Volksgesundheitspflege' im Raum Dresden." In Pommerin, *Dresden unterm Hakenkreuz*, 193-207.
- Faulstich, Heinz. *Hungersterben in der Psychiatrie 1914-1949: mit einer Topographie der NS-Psychiatrie*. Freiburg im Breisgau: Lambertus, 1998.
- Feldman, Gerald D. *Army, Industry and Labor in Germany, 1914-1918*. Princeton: Princeton University Press, 1966.
- . "Bayern und Sachsen in der Hyperinflation 1922/23." *Historische Zeitschrift* 238, no. 3 (June 1984): 569-609.
- Fenton, Alexander, ed. *Order and Disorder: The Health Implications of Eating and Drinking in the Nineteenth and Twentieth Centuries*. Fifth Symposium of the International Commission for Research into European Food History. East Linton: Tuckwell Press, 2000.
- Feudtner, John Christopher. *Bittersweet: Diabetes, Insulin, and the Transformation of Illness*. Chapel Hill: University of North Carolina Press, 2003.
- Finlay, Mark R. "Early Marketing of the Theory of Nutrition: The Science and Culture of Liebig's Extract of Meat." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 48-74.
- . "Quackery and Cookery: Justus von Liebig's Extract of Meat and the Theory of Nutrition in the Victorian Age." *Bulletin of the History of Medicine* 66, no. 3 (Fall 1992): 404-418.

- Fitzpatrick, Sheila. *Everyday Stalinism: Ordinary Life in Extraordinary Times; Soviet Russia in the 1930s*. New York: Oxford University Press, 1999.
- Föllmer, Moritz. "Der 'kranke Volkskörper'. Industrielle, hohe Beamte und der Diskurs der nationalen Regeneration in der Weimarer Republik." *Geschichte und Gesellschaft* 27, no. 1 (2001): 41-68.
- . "Was Nazism Collectivistic? Redefining the Individual in Berlin, 1930-1945." *Journal of Modern History* 82, no. 1 (March 2010): 61-100.
- Forth, Christopher E., and Ana Carden-Coyne, eds. *Cultures of the Abdomen: Diet, Digestion, and Fat in the Modern World*. New York: Palgrave MacMillan, 2005.
- Foucault, Michel. *Discipline and Punish*. Translated by Alan Sheridan. New York: Pantheon, 1977.
- . *The History of Sexuality*. 3 vols. Translated by Robert Hurley. New York: Pantheon Books, 1978-1986.
- Framke, Gisela, ed. *Man nehme...: Literatur für Küche und Haus aus dem Deutschen Kochbuchmuseum*. Bielefeld: Regionalgeschichte, 1998.
- Franzmann, Andreas. "Der 'gebildete Laie' als Adressat des Forschers. Sequenzielle Analyse von Titel und Vorrede zur ersten Ausgabe von Justus von Liebig's 'Chemischen Briefen' von 1844." In Kretschmann, *Wissenspopularisierung*, 235-256.
- Fritzen, Florentine. *Gesünder Leben: Die Lebensreformbewegung im 20. Jahrhundert*. Stuttgart: Franz Steiner, 2006.
- . "Vom 'Menschheitsfrühling' zu 'Neuform heil!' wie Lebensreformer 1933 den Umbruch von der 'Neuen Zeit' zur 'Großen deutschen Revolution' vollzogen." *Forschung Frankfurt* 24, no. 4 (2006): 63-66.
- Fritzsche, Peter. *Germans into Nazis*. Cambridge, MA: Harvard University Press, 1998.
- Fru-ton, Joseph S. "The Liebig Research Group: A Reappraisal." *Proceedings of the American Philosophical Society* 132, no. 1 (March 1988): 1-66.
- Funke, Ulf-Norbert. *Karl August Lingner: Leben und Werk eines gemeinnützigen Groß-industriellen*. Dresden: B-Edition Dresden, 1996. Reprinted Munich: GRIN-Verlag, 2007.
- . *Lingner-Archiv*. Accessed 25 October 2012. <http://lingner-archiv.jimdo.com/>.
- Fyfe, Aileen, and Bernard V. Lightman, eds. *Science in the Marketplace: Nineteenth-Century Sites and Experiences*. Chicago: University of Chicago Press, 2007.
- Gaugele, Elke, and K. Reiss. *Jugend, Mode, Geschlecht: die Inszenierung des Körpers in der Konsumkultur*. Frankfurt am Main: Campus Verlag, 2003.
- Geller, Jay. "It's 'Alimentary': Feuerbach and Dietetics of Antisemitism." In Forth and Carden-Coyne, *Cultures of the Abdomen*, 127-146.
- Gillerman, Sharon. *Germans into Jews: Remaking the Jewish Social Body in the Weimar Republic*. Stanford: Stanford University Press, 2009.
- Gilman, Sander L. *The Jew's Body*. New York: Routledge, 1991.
- Golec, Michael J. "Optical Constancy, Discontinuity, and Nondiscontinuity in the Eameses' *Rough Sketch*." In *The Educated Eye: Visual Culture and Pedagogy in the Life Sciences*, edited by Nancy Anderson and Michael R. Dietrich, 162-185. Hanover, NH: Dartmouth College Press, 2012.
- Gradmann, Christoph. "Robert Koch and the Pressures of Scientific Research: Tuberculosis and Tuberculin." *Medical History* 45 (2001): 1-32.

- Gray, Marion W. *Productive Men, Reproductive Women: The Agrarian Household and the Emergence of Separate Spheres during the German Enlightenment*. New York: Berghahn Books, 2000.
- Grebing, Helga, Hans Mommsen, and Karsten Rudolph, eds. *Demokratie und Emanzipation Zwischen Saale und Elbe: Beiträge zur Geschichte der Sozial-demokratischen Arbeiterbewegung bis 1933*. Essen: Klartext Verlag, 1993.
- Greenhalgh, Paul. *Ephemeral Vistas: The Expositions Universelles, Great Exhibitions and World's Fairs, 1851-1939*. Manchester: Manchester University Press, 1988.
- Grossmann, Atina. *Reforming Sex: The German Movement for Birth Control and Abortion Reform, 1920-1950*. Oxford: Oxford University Press, 1995.
- Grüne, Jutta. *Anfänge staatlicher Lebensmittelüberwachung in Deutschland: der "Vater der Lebensmittelchemie" Joseph König (1843-1930)*. Stuttgart: Franz Steiner, 1994.
- Hafner, Karl Heinz, and Rolf Winau. "'Die Freigabe der Vernichtung lebensunwerten Lebens.' Eine Untersuchung zu der Schrift von Karl Binding und Alfred Hache." *Medizin-historisches Journal* 9, no. 3/4 (1974): 227-254.
- Hagemann, Karen. "Of 'Old' and 'New' Housewives: Everyday Housework and the Limits of Household Rationalization in the Urban Working-Class Milieu of the Weimar Republic." *International Review of Social History* 41, no. 3 (December 1996): 305-330.
- Halling, Thorsten, Julia Schafer, and Jörg Vögele. "Volk, Volkskörper, Volkswirtschaft—Bevölkerungsfragen in Forschung und Lehre von Nationalökonomie und Medizin." In Mackensen and Reulecke, *Das Konstrukt "Bevölkerung"*, 388-428.
- Harris, Jonathan Gil. *Foreign Bodies and the Body Politic: Discourses of Social Pathology in Early Modern England*. Cambridge: Cambridge University Press, 1998.
- Harvey, A. D. "The Body Politic: Anatomy of a Metaphor." *Contemporary Review* 275, no. 1603 (August 1999): 85-93.
- . *Body Politic: Political Metaphor and Political Violence*. Newcastle, U.K.: Cambridge Scholars Publishing, 2007.
- Harvey, David. *Paris, Capital of Modernity*. New York: Routledge, 2003.
- Harvey, Elizabeth. *Women and the Nazi East: Agents and Witnesses of Germanization*. New Haven: Yale University Press, 2003.
- Hau, Michael. *The Cult of Health and Beauty in Germany: A Social History 1890-1930*. Chicago: University of Chicago Press, 2003.
- . "The Holistic Gaze in German Medicine, 1890-1930." *Bulletin of the History of Medicine* 74 (2000): 495-524.
- . "The Humane Expert: The Crisis of Modern Medicine during the Weimar Republic." In *Experts in Science and Society*, edited by Elke Kurz-Milcke and Gerd Gigerenzer, 105-122. New York: Kluwer, 2004.
- Heidel, Günter. "Die I. Internationale Hygiene-Ausstellung in Dresden und die Gründung des Deutschen Hygiene-Museums." *Zeitschrift für die gesamte Hygiene und ihre Grenzgebiete* 33, no. 8 (1987): 411-415.
- Heidel, Günter, and Marina Lienert. "Georg Ilberg (1862-1942): Leben und ärztlich-humanistisches Vermächtnis." *Psychiatrie, Neurologie, und medizinische Psychologie* (Leipzig) 41, no. 11 (November 1989): 651-659.
- Heidel, Wolfgang. "Ernährungswirtschaft und Verbrauchslenkung im Dritten Reich 1936-1939." Dissertation, Free University of Berlin, 1989.

- Heim, Susanne. *Kalorien, Kautschuk, Karrieren. Pflanzenzüchtung und landwirtschaftliche Forschung in Kaiser-Wilhelm-Instituten 1933-1945*. Göttingen: Wallstein Verlag, 2003.
- Heimpel, Elisabeth. "Heyl, Hedwig, geborene Crüsemann." In *Neue Deutsche Biographie* [online]. Vol. 9, 83-84 (1972). <http://www.deutsche-biographie.de/pnd118979965.html>.
- Hein, Jakob. "Das deklarative Langzeitgedächtnis Berlins." *Bibliotheks-Magazin*, Sonderausgabe 350: Für Forschung und Kultur (2011): 119.
- Heischkel, Edith. "Das Wasser als Arzneimittel in der romantischen Medizin." *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften* 36, no. 3 (1952):119-149.
- Heischkel-Artelt, Edith, ed. *Ernährung und Ernährungslehre im 19. Jahrhundert. Vorträge eines Symposium am 5. und 6. Januar 1973 in Frankfurt am Main*. Band 6, Studien zur Medizingeschichte im Neunzehnten Jahrhundert. Göttingen: Vandenhoeck & Ruprecht, 1976.
- Herminghouse, Patricia, and Magda Mueller, eds. *Gender and Germanness: Cultural Productions of Nation*. Providence: Berghahn Books, 1997.
- Heyll, Uwe. "Der 'Kampf ums Eiweißminimum.'" *DmW* 132 (2007): 2768-2773.
- . *Wasser, Fasten, Luft und Licht: die Geschichte der Naturheilkunde in Deutschland*. Frankfurt am Main: Campus Verlag, 2006.
- Hierholzer, Vera. *Nahrung nach Norm: Regulierung von Nahrungsmittelqualität in der Industrialisierung 1871-1914*. Göttingen: Vandenhoeck & Ruprecht, 2010.
- Hilger, Susanne. "The Spread of Convenience Food in 20th Century Germany." Paper presented at 12th Annual Conference of the European Business History Association, Bergen, Norway, 21-23 August 2009.
- Hobsbawm, Eric J., and Terence O. Ranger, eds. *The Invention of Tradition*. Cambridge: Cambridge University Press, 1983.
- Holmes, Frederic Lawrence. *Claude Bernard and Animal Chemistry the Emergence of a Scientist*. Cambridge: Harvard University Press, 1974.
- . "The Formation of the Munich School of Metabolism." In *The Investigative Enterprise: Experimental Physiology in Nineteenth-Century Medicine*, edited by William Coleman and Frederic Lawrence Holmes, 179-210. Berkeley: University of California Press, 1988.
- Horrocks, Sally M. "The Business of Vitamins: Nutrition Science and the Food Industry in Inter-war Britain." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 235-258.
- Houssay, B. A. "The Discovery of Pancreatic Diabetes: The Role of Oscar Minkowski." *Diabetes* 1, no. 2 (March-April 1952): 112-116.
- Huegel, Arnulf. *Kriegsernährungswirtschaft Deutschlands während des Ersten und Zweiten Weltkriegs im Vergleich*. Konstanz: Hartung-Gorre, 2003.
- Huerkamp, Claudia. "Medizinische Lebensreform im späten 19. Jahrhundert. Die Naturheilbewegung in Deutschland als Protest gegen die naturwissenschaftliche Universitätsmedizin." *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 73, no. 2 (1986): 158-182.
- Huff, Joyce L. "Corporeal Economies: Work and Waste in Nineteenth-Century Constructions of Alimentation." In Forth and Carden-Coyne, *Cultures of the Abdomen*, 31-50.
- Hughes, R. E. "James Lind and the Cure of Scurvy: An Experimental Approach." *Medical History* 19, no. 4 (October 1975): 342-351.
- Hüntelmann, Axel C. *Hygiene im Namen des Staates: Das Reichsgesundheitsamt 1876-1933*. Göttingen: Wallstein Verlag, 2008.

- Hüntelmann, Axel C., Johannes Vossen, and Herwig Czech, eds. *Gesundheit und Staat: Studien zur Geschichte der Gesundheitsämter in Deutschland, 1870-1950*. Husum: Matthiesen, 2006.
- Hürlimann, Annemarie, Martin Roth, and Klaus Vogel, eds. *Fremdkörper/Fremde Körper. Von unvermeidlichen Kontakten und widerstreitenden Gefühlen. Katalog zur Ausstellung des Deutschen Hygiene-Museums Dresden vom 06.10.1999 bis 27.02.2000*. Ostfildern-Ruit: Hatje Cantz, 1999.
- Jay, Paul. "Picture This: Literary Theory and the Study of Visual Culture." Address delivered at La Sapienza, Rome, Italy, March 2000. Accessed 20 March 2007. <http://home.comcast.net/~jay.paul/jay.htm>.
- Jensen, Erik. *Body by Weimar: Athletes, Gender, and German Modernity*. New York: Oxford University Press, 2010.
- Jones, Larry, and James N. Retallack, eds. *Elections, Mass Politics, and Social Change in Modern Germany*. Washington, DC: German Historical Institute, 1992.
- Judd, Robin. *Contested Rituals: Circumcision, Kosher Butchering, and Jewish Political Life in Germany, 1843-1933*. Ithaca: Cornell University Press, 2007.
- Jütte, Robert. "The Paradox of Professionalisation: Homeopathy and Hydrotherapy as Unorthodoxy in Germany in the 19th and early 20th Century." In *Culture, Knowledge, and Healing: Historical Perspectives of Homeopathic Medicine in Europe and North America*, edited by Robert Jütte, Guenter B. Risse, and John Woodward, 65-82. Sheffield: European Association for the History of Medicine and Health Publications, 1998.
- Kamminga, Harmke. "Nutrition for the People, or the Fate of Jacob Moleschott's Contest for a Humanist Science." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 15-47.
- . "Vitamins and the Dynamics of Molecularization: Biochemistry, Policy and Industry in Britain, 1914-1939." In de Chadarevian and Kamminga, *Molecularizing Biology and Medicine*, 83-105.
- Kamminga, Harmke, and Andrew Cunningham, eds. *The Science and Culture of Nutrition, 1840-1940*. Atlanta: Rodopi, 1995.
- Kantorowicz, Ernst Hartwig. *The King's Two Bodies: A Study in Mediaeval Political Theology*. Princeton: Princeton University Press, 1997, 1957.
- Katalyse e. V. and Buntstift e. V., eds. *Ernährungskultur im Wandel der Zeiten*. Cologne: Katalyse, 1997.
- Kater, Michael H. "Die Artamanen—Völkische Jugend in der Weimarer Republik." *Historische Zeitschrift* Band 213 (1971): 577-638.
- . "Die 'Gesundheitsführung' des Deutschen Volkes." *Medizinhistorisches Journal* 18, no. 4 (1983): 349-375.
- Keller, Katrin. *Landesgeschichte Sachsen*. Stuttgart: Ulmer, 2002.
- Kern, Stephen. *The Culture of Time and Space, 1880-1918*. Cambridge, MA: Harvard University Press, 2003, 1983.
- König, Gudrun M. "Die Erziehung der Käufer. Konsumkultur und Konsumkritik um 1900." *Vokus* 15 (2005): 39-57.
- König, Wolfgang. "Homo consumens: Historische und systematische Betrachtungen." In Lummel and Deak, *Einkaufen*, 189-202.

- . *Volkswagen, Volksempfänger, Volksgemeinschaft: "Volkspunkte" im Dritten Reich, vom Scheitern einer national-sozialistischen Konsumgesellschaft*. Paderborn: Schöningh Verlag, 2004.
- Konner, Melvin. *The Jewish Body*. New York: Nextbook, 2009.
- Koonz, Claudia. *Mothers in the Fatherland: Women, the Family and Nazi Politics*. New York: St. Martin's Press, 1987.
- Kopsidis, Michael. "Produktmärkte und Agrarentwicklung 1750 bis 1880. Die letzte Phase vorindustrieller Agrarentwicklung als erste Phase des säkularen Landwirtschaftlichen Wachstums der Neuzeit und Moderne? Implikationen für Sachsen." In *UnGleichzeitigkeiten: Transformationsprozesse in der ländlichen Gesellschaft der (Vor-)Moderne*, edited by Ira Spieker, Elke Schlenkrich, Johannes Moser, and Martina Schattkowsky. Baustein aus dem Institut für Sächsische Geschichte und Volksgeschichte Nr. 13, 61-76. Dresden: Thelem, 2008.
- Kotkin, Stephen. *Magnetic Mountain: Stalinism as a Civilization*. Los Angeles: University of California Press, 1995.
- Krabbe, Wolfgang R. "Die Lebensreform. Individualisierte Heilserwartung im industriellen Zeitalter." *Journal für Geschichte* 2 (1980): 8-13.
- Kretschmann, Carsten, ed. *Wissenspopularisierung: Konzepte der Wissensverbreitung im Wandel*. Berlin: Akademie, 2003.
- Kruppa, Reinhold. *Lina Morgenstern: "Social couragiert und frauenbewegt." Ein Berliner Lebensbild*. Munich: GRIN-Verlag, 2008.
- Kühne, Thomas. *Belonging and Genocide: Hitler's Community, 1918-1945*. New Haven: Yale University Press, 2010.
- Lapp, Benjamin. "Der Aufstieg des Nationalsozialismus in Sachsen." In Pommerin, *Dresden unterm Hakenkreuz*, 1-24.
- . *Revolution from the Right: Politics, Class, and the Rise of Nazism in Saxony, 1919-1933*. Atlantic Highlands, NJ: Humanities Press International, 1997.
- Lässig, Simone, and Karl Heinrich Pohl, eds. *Sachsen im Kaiserreich: Politik, Wirtschaft und Gesellschaft im Umbruch*. Weimar: Böhlau Verlag, 1997.
- Latour, Bruno. *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes: Open University Press, 1987.
- Leavitt, Judith Walzer. *Typhoid Mary: Captive to the Public's Health*. Boston: Beacon Press, 1996.
- Lerner, Paul. *Hysterical Men: War, Psychiatry, and the Politics of Trauma in Germany, 1890-1930*. Ithaca: Cornell University Press, 2003.
- Lienert, Marina. "'Naturheilkunde ist keine Wissenschaft!' Naturheilvereine, Ortskrankenkassen und Parteien in den Auseinandersetzungen und die Errichtung eines Lehrstuhls für Naturheilkunde an der Universität Leipzig (1894-1924)." In Dinges, *Medizinkritische Bewegungen im Deutschen Reich*, 59-78.
- . *Naturheilkundiges Dresden*. Dresden: Elbhang-Kurier-Verlag, 2002.
- . "Das Rudolf-Heß-Krankenhaus in Dresden-Johannstadt—Zentrum der Neuen Deutschen Heilkunde im Dritten Reich." In Pommerin, *Dresden unterm Hakenkreuz*, 209-226.
- . "Die Staatsanstalt für Krankengymnastik und Massage." *Ärzteblatt Sachsen* 5 (2009): 230-232.

- Linke, Uli. "Between Blood and Soil: Body Politics in Nazi Germany." In *Blood and Nation: The European Aesthetics of Race*, 197-211. Philadelphia: University of Pennsylvania Press, 1999.
- Lovin, Clifford R. "Agricultural Reorganization in the Third Reich: The Reich Food Corporation (Reichsnährstand), 1933-1936." *Agricultural History* 43, no. 4 (October 1969): 447-461.
- Lummel, Peter. "Food Provisioning in the German Army of the First World War." In Zweiniger-Bargielowska, Duffett, and Drouard, *Food and War in Twentieth-Century Europe*, 13-25.
- Lummel, Peter, and Alexandra Deak, eds. *Einkaufen: eine Geschichte des täglichen Bedarfs. Arbeit und Leben auf dem Lande*, Band 10. Berlin: Verein der Freunde der Domäne Dahlem, 2005.
- Mackensen, Rainer, and Jürgen Reulecke, eds. *Das Konstrukt "Bevölkerung" vor, im und nach dem "Dritten Reich"*. Wiesbaden: Verlag für Sozialwissenschaften, 2005.
- Malich, Uwe. "Zur Entwicklung des Reallohns im Ersten Weltkrieg." *Jahrbuch für Wirtschaftsgeschichte* no. 4 (October 1980): 55-70.
- McCay, Clive M. "Gustav B. von Bunge (1844-1920)." *Journal of Nutrition* (1953): 1-19.
- McCollum, Elmer Verner. *A History of Nutrition: The Sequence of Ideas in Nutrition Investigations*. Boston: Houghton Mifflin Company & Riverside Press, 1957.
- McNeill, William H. "How the Potato Changed the World's History." *Social Research* 66 (Spring 1999): 72-78.
- Melosi, Martin V. *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present*. Baltimore: Johns Hopkins University Press, 2000.
- Melzer, Jörg. *Vollwerternährung: Diätetik, Naturheilkunde, Nationalsozialismus, sozialer Anspruch*. Stuttgart: Franz Steiner, 2003.
- Merta, Sabine. "Margarine in Competition with Butter in Germany (1872-1933): The Example of Van den Bergh's Margarine Factory in Kleve." In *The Food Industries of Europe in the Nineteenth and Twentieth Centuries*, edited by Derek J. Oddy and Alain Drouard, 119-132. Farnham, Eng.: Ashgate, 2013.
- . *Wege und Irrwege zum modernen Schlankheitskult. Diätikost und Körperkultur als Suche nach neuen Lebensstilsformen 1880-1930*. Stuttgart: Franz Steiner, 2003.
- Meyer-Renschhausen, Elisabeth, and Albert Wirz. "Dietetics, Health Reform and Social Order: Vegetarianism as a Moral Physiology. The Example of Maximilian Bircher-Benner (1867-1939)." *Medical History* 43, no. 3 (July 1999): 323-341.
- Micale, Mark S. *Approaching Hysteria: Disease and its Interpretations*. Princeton: Princeton University Press, 1995.
- Michl, Susanne. *Im Dienste des "Volkskörpers": Deutsche und Französische Ärzte im Ersten Weltkrieg*. Göttingen: Vandenhoeck & Ruprecht, 2007.
- Milles, Dietrich. "Working Capacity and Calorie Consumption: The History of Rational Physical Economy." In Kamminga and Cunnginham, *The Science and Culture of Nutrition*, 75-96.
- Mitchell, W. J. T. *Picture Theory: Essays on Verbal and Visual Representation*. Chicago: University of Chicago Press, 1994.
- Moeller, Robert G. "Dimensions of Social Conflict in the Great War: The View from the German Countryside." *Central European History* 14, no. 2 (June 1981): 142-168.
- Mokyr, Joel. *Gifts of Athena: Historical Origins of the Knowledge Economy*. Princeton: Princeton University Press, 2002.
- Mol, Annemarie. "I Eat an Apple. On Theorizing Subjectivities." *Subjectivity: International Journal of Critical Psychology* 22, no. 1 (2008): 28-37.

- Mosse, George L. *Nationalism and Sexuality: Respectability and Abnormal Sexuality in Modern Europe*. New York: Howard Fertig, 1985.
- Mouton, Michelle. *From Nurturing the Nation to Purifying the Volk: Weimar and Nazi Family Policy, 1918-1945*. New York: German Historical Institute & Cambridge University Press, 2007.
- Neubert, Hanns-Georg. "Karl August Lingner: 1861-1916: ein Wegbereiter hygienischer Volksaufklärung." Dissertation, University of Cologne, 1971.
- Neumann, Alexander. "Nutritional Physiology in the 'Third Reich' 1933-1945." In *Man, Medicine, and the State: The Human Body as an Object of Government Sponsored Medical Research in the 20th Century*, edited by Wolfgang U. Eckart, 49-60. Stuttgart: Franz Steiner, 2006.
- Neumann, Boaz. "The Phenomenology of the German People's Body (*Volkskörper*) and the Extermination of the Jewish Body." *New German Critique* 106 (Winter 2009): 149-181.
- Nikolow, Sybilla. "Anormale Kollektive. Die Darstellung des »Altersaufbaus der Bevölkerung des Deutschen Reiches« auf der Gesolei von 1926." In *Kunst, Sport und Körper: Ge So Lei*, edited by Hans Körner and Angela Stercken, 217-226. Band 1: 1926-2002. Ostfildern-Ruit: Hatje Cantz, 2002.
- . "Die graphisch-statistische Darstellung der Bevölkerung: Bevölkerungskonzepte in der Gesundheitsaufklärung in Deutschland vor 1933." In *Bevölkerungslehre und Bevölkerungspolitik vor 1933*, edited by Rainer Mackensen, 297-314. Oplade: Leske + Budrich, 2002.
- . "Imaginäre Gemeinschaften: Statistische Bilder der Bevölkerung." In *Konstruierte Sichtbarkeiten: Wissenschafts- und Technikbilder seit der Frühen Neuzeit*, edited by Martina Heßler, 263-278. München: Wilhelm Fink, 2006.
- . "Die Nation als statistisches Kollektiv: Bevölkerungskonstruktionen im Kaiserreich und in der Weimarer Republik." In *Wissenschaft und Nation in der europäischen Geschichte*, edited by Ralph Jessen and Jakob Vogel, 235-259. New York: Campus Verlag, 2002.
- . "Statistische Bilder der Bevölkerung in den großen Hygieneausstellungen als Wissenobjekte." In Mackensen and Reulecke, *Das Konstrukt "Bevölkerung"*, 476-488.
- . "Der statistische Blick auf Krankheit und Gesundheit: 'Kurvenlandschaften' in Gesundheitsausstellungen am Beginn des 20. Jahrhunderts in Deutschland." In *Infographiken, Medien, Normalisierung. Zur Kartografie politisch-sozialer Landschaften*, edited by Ute Gerhardt, Jürgen Link, and Ernst Schulte-Holtey. Vol. 1: Grundlagen des Normalismus, 223-241. Heidelberg: Synchron, 2001.
- Nitsch, Meinolf. *Private Wohltätigkeits-Vereine im Kaiserreich: Die praktische Umsetzung der bürgerlichen Sozialreform in Berlin*. Berlin: Walter de Gruyter, 1999.
- Nolte, Karen. "Dying at Home: Nursing of the Critically and Terminally Ill in Private Care in Germany Around 1900." *Nursing Inquiry* 16, no. 2 (2009): 1144-154.
- . "The Relationship between Doctors and Nurses in Agnes Karll's Letters around 1900." *Women's History Magazine* 65 (Spring 2011): 9-17.
- Nonn, Christoph. "Arbeiter, Bürger und 'Agrarier': Stadt-Land-Gegensatz und Klassenkonflikt im Wilhelminischen Deutschland am Beispiel des Königreichs Sachsen." In Grebing, Mommsen, and Rudolph, *Demokratie und Emanzipation Zwischen Saale und Elbe*, 101-113.
- Nübel, Christoph. *Die Mobilisierung der Kriegsgesellschaft: Propaganda und Alltag im Ersten Weltkrieg in Münster*. Münster: Waxmann Verlag, 2008.

- Oberndörfer, Dieter. "Zuwanderung und der Wohlstand Deutschlands." *Sowi. Sozialwissenschaftliche Informationen. das Journal für Geschichte, Politik, Wirtschaft und Kultur* 31, 2 (2002): 86-91.
- Obst, Helmut. *Karl August Lingner. Ein Volkswohltäter? Kulturhistorische Studie anhand der Lingner-Bombastus-Prozesse 1906-1911*. Göttingen: V & R Unipress, 2005.
- Offer, Avner. *The First World War: An Agrarian Interpretation*. Oxford: Clarendon Press, 1989.
- Olszweski, Todd M. "The Causal Conundrum: The Diet-Heart Hypothesis and the Management of Uncertainty in American Medicine." *Journal of the History of Medicine and Allied Sciences*, published online 5 March 2014. doi: 10.1093/jhmas/jru001.
- Orland, Barbara. "Bad Habits and Liquid Pleasures: Milk and the Alcohol Abstinence Movement in late 19th Century Germany." *Food & History* 5, no. 2 (2007): 153-169.
- . "The Invention of the Nutrient. William Prout, Digestion and Alimentary Substances in the 1820s." *Food & History* 8, no. 1 (2010): 149-170.
- Osten, Philipp. "Emotion, Medizin und Volksbelehrung: die Entstehung des 'deutschen Kulturfilms.'" *Gesnerus* 66, no. 1 (2009): 67-102.
- Otis, Laura. *Networking: Communicating with Bodies and Machines in the Nineteenth Century*. Ann Arbor: University of Michigan Press, 2001.
- . *Organic Memory: History and the Body in the Late Nineteenth and Early Twentieth Centuries*. Lincoln: University of Nebraska Press, 1994.
- Overgaard, Svend Skafte. "Mikkel Hindhede and the Science and Rhetoric of Food Rationing in Denmark, 1917-1918." In Zweiniger-Bargielowska, Duffett, and Drouard, *Food and War in Twentieth-Century Europe*, 201-215.
- Pammer, Michael, Herta Neiß, and Michael John, eds. *Erfahrung der Moderne. Festschrift für Roman Sandgruber zum 60. Geburtstag*. Stuttgart: Franz Steiner, 2007.
- Pendergast, Karen, Anne Wolf, Beth Sherrill, Ziaolei Zhou, Louis J. Aronne, Ian Caterson, Nicholas Finer, Hans Hauner, James Hill, Luc Van Gaal, Florence Coste, and Jean-Pierre Despres. "Impact of Waist Circumference Difference on Health-Care Cost among Overweight and Obese Subjects: The PROCEED Cohort." *Value in Health* 13, no. 4 (June 2010): 402-410.
- Perry, Heather. *Recycling the Disabled: Army, Medicine, and Modernity in WWI Germany*. Manchester: Manchester University Press, forthcoming.
- Petzina, Dietmar. *Autarkiepolitik im Dritten Reich*. Stuttgart: Deutsche Verlagsanstalt, 1968.
- Peukert, Detlev J. K. *The Weimar Republic: The Crisis of Classical Modernity*. Translated by Richard Deveson. New York: Hill and Wang, 1989.
- Pfalzer, Stephan. "Der 'Butterkrawall' im Oktober 1915. Die erste größere Antikriegsbewegung in Chemnitz." In Grebing, Mommsen, and Rudolph, *Demokratie und Emanzipation zwischen Saale und Elbe*, 196-201.
- Pine, Lisa. *Nazi Family Policy, 1933-1945*. Oxford: Berg, 1997.
- Planert, Ute. "Der dreifache Körper des Volkes: Sexualität, Biopolitik und die Wissenschaften vom Leben." *Geschichte und Gesellschaft* 26, no. 4 (2000): 539-576.
- Plessner, Theo, and Hans-Ulrich Thamer, eds. *Arbeit, Leistung und Ernährung: vom Kaiser-Wilhelm-Institut für Arbeitsphysiologie in Berlin zum Max-Planck-Institut für Molekulare Physiologie und Leibniz-Institut für Arbeitsforschung in Dortmund*. Stuttgart: Steiner Verlag, 2012.
- Po, Henry N., and N. M. Senozan. "The Henderson-Hasselbalch Equation: Its History and Limitations." *Journal of Chemical Education* 78, no. 11 (2001): 1499-1503.

- Pollan, Michael. *In Defense of Food: An Eater's Manifesto*. New York: Penguin Press, 2009.
- Pommerin, Reiner, ed. *Dresden unterm Hakenkreuz*. Cologne: Böhlau, 1998.
- Poore, Carol. *Disability in Twentieth-Century German Culture*. Ann Arbor: University of Michigan Press, 2007.
- Poovey, Mary. *Making a Social Body: British Cultural Formation, 1830-1864*. Chicago: University of Chicago Press, 1995.
- Porter, Dorothy, ed. *The History of Public Health and the Modern State*. Amsterdam: Rodopi, 1994.
- Prickett, David J. "Body Crisis, Identity Crisis: Homosexuality and Aesthetics in Wilhelmine- and Weimar Germany." Dissertation, University of Cincinnati, 2003.
- Proctor, Robert. *The Nazi War on Cancer*. Princeton: Princeton University Press, 1999.
- . *Racial Hygiene: Medicine under the Nazis*. Cambridge, MA: Harvard University Press, 1988.
- Proctor, Tammy M. *Civilians in a World at War, 1914-1918*. New York: New York University Press, 2010.
- Raithel, Thomas. *Das schwierige Spiel des Parlamentarismus: Deutscher Reichstag und französische Chambre des Députés in den Inflationskrisen der 1920er Jahre*. Munich: R. Oldenbourg, 2005.
- Reagan, Leslie. "Projecting Breast Cancer: Self-Examination Films and the Making of a New Cultural Practice." In *Medicine's Moving Pictures: Medicine, Health and Bodies in American Film and Television*, edited by Leslie Reagan, Nancy Tomes, and Paula Treichler, 163-195. Rochester: University of Rochester Press, 2007.
- Reagin, Nancy Ruth. *Sweeping the German Nation: Domesticity and National Identity in Germany, 1870-1945*. New York: Cambridge University Press, 2007.
- Redlich, Fritz. "Science and Charity: Count Rumford and His Followers." *International Review of Social History* 16, no. 2 (August 1971): 184-216.
- Regin, Cornelia. *Selbsthilfe und Gesundheitspolitik: die Naturheilbewegung im Kaiserreich, 1889 bis 1914*. Stuttgart: Franz Steiner, 1995.
- . "Zwischen Angriff und Abwehr: Die Naturheilbewegung als medizinkritische Öffentlichkeit im Deutschen Kaiserreich." In Dinges, *Medizinkritische Bewegungen im Deutschen Reich*, 39-58.
- Reichardt, Eike. *Health, Race and Empire: Popular-Scientific Spectacles and National Identity in Imperial Germany, 1871-1914*. Lexington, KY: Lulu.com, 2008.
- Reidegeld, Eckart. "Naturlehre, Ökonomie und Armenpflege—Vom Wesen und von der Bedeutung einer sozialreformerischen Innovation." *Zeitschrift für Sozialreform* 46, no. 6 (June 2000): 548-566.
- Reith, Reinhold. "'Hurrah die Butter ist alle!' 'Fettlücke' und 'Eiweißlücke' im Dritten Reich." In Pammer, Neiß, and John, *Erfahrung der Moderne*, 403-426.
- Rennard, B. O., R. F. Ertl, G. L. Gossman, R. A. Robbins, and S. I. Rennard. "Chicken soup inhibits neutrophil chemotaxis in vitro." *Chest* 118, no. 4 (October 2000): 1150-1157.
- Retallack, James, ed. *Saxony in German History: Culture, Society, and Politics, 1830-1933*. Ann Arbor: University of Michigan Press, 2000.
- Reynolds, Andrew. "The Theory of the Cell State and the Question of Cell Autonomy in Nineteenth and Early Twentieth-Century Biology." *Science in Context* 20, no. 1 (2007): 71-95.
- Roerkohl, Anne. *Hungerblockade und Heimatfront: die kommunale Lebensmittelversorgung in Westfalen während des Ersten Weltkrieges*. Stuttgart: Franz Steiner, 1991.

- Roeßiger, Susanne, and Heidrun Merk, eds. *Hauptsache gesund! Gesundheitsaufklärung zwischen Disziplinierung und Emanzipation. Katalog zur Ausstellung vom 02.07.1998 bis 03.01.1999*. Marburg: Jonas Verlag, 1998.
- Rogaski, Ruth. *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China*. Berkeley: University of California Press, 2004.
- Rollet, Catherine. "The Home and Family Life." In Winter and Robert, *Capital Cities at War*, vol. 2, 315-353.
- Rose, Nikolas, and Carlos Novas. "Biological Citizenship." In *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, edited by Aihwa Ong and Stephen Collier, 439-463. Malden, MA: Blackwell, 2003.
- Rose, Nikolas. *The Politics of Life Itself: Biomedicine, Power and Subjectivity in the Twenty-First Century*. Princeton: Princeton University Press, 2007.
- Rosen, George. "The Fate of the Concept of Medical Police 1780-1890." *Centaurus* 5, no. 2 (June 1957): 97-113. Republished in *Centaurus* 50, no. 1/2 (January 2008, 1957): 46-62, with commentaries by Christopher Hamlin, 63-69, and Michael Knipper, 70-72.
- . *A History of Public Health*. Baltimore: Johns Hopkins University Press, 1993, 1958.
- Ross, Ellen. *Love and Toil: Motherhood in Outcast London, 1870-1918*. New York: Oxford University Press, 1993.
- Rossol, Nadine. *Performing the Nation in Interwar Germany: Sports, Spectacles and Political Symbols, 1926-1936*. New York: Palgrave Macmillan, 2010.
- Rothschuh, Karl E. "Krankenkost in alten Tagen." *Deutsches medizinisches Journal* 12, no. 5 (5 March 1961): 117-123.
- . *Naturheilbewegung—Reformbewegung—Alternativbewegung*. Stuttgart: Hippokrates Verlag, 1983.
- Rudolph, Karsten. "Das 'rote Königreich': Die sächsische Sozialdemokratie im Wilhelminischen Deutschland." In Lässig and Pohl, *Sachsen im Kaiserreich*, 87-100.
- Rummel, Christian. *Ragnar Berg: Leben und Werk des schwedischen Ernährungsforschers und Begründers der basischen Kost*. Dissertation, Technical University Dresden, 2001. Frankfurt am Main: Peter Lang, 2003.
- Sarason, Philipp. *Reizbare Maschinen: eine Geschichte des Körpers 1765-1914*. Frankfurt am Main: Suhrkamp Verlag, 2001.
- Sarasin, Philipp, Silvia Berger, Marianne Hänsler, and Myriam Spörri, eds. *Bakteriologie und Moderne: Studien zur Biopolitik des Unsichtbaren, 1870-1920*. Frankfurt am Main: Suhrkamp Verlag, 2007.
- Sarasin, Philipp, and Jakob Tanner, eds. *Physiologie und industrielle Gesellschaft: Studien zur Verwissenschaftlichung des Körpers im 19. und 20. Jahrhundert*. Frankfurt am Main: Suhrkamp Verlag, 1998.
- Sawchuk, Kim. "Biotourism, *Fantastic Voyage*, and Sublime Inner Space." In *Wild Science: Reading Feminism, Medicine and the Media*, edited by Janine Marchessault and Kim Sawchuk, 9-23. New York: Routledge, 2000.
- Sawday, Jonathan. *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture*. London: Routledge, 1995.
- Scheske, Manfred, Martin Roth, and Hans-Christian Täubrich, eds. *In aller Munde. Einhundert Jahre Odol*. Ostfildern-Ruit: Hatje Cantz, 1993.

- Schirmer, Uwe. "Ernährung im Erzgebirge im 15. und 16. Jahrhundert: Produktion, Handel und Verbrauch." In *Landesgeschichte in Sachsen: Tradition und Innovation*, edited by Rainer Aurig, Steffen Herzog, Simone Lässig, 129-144. Bielefeld: Verlag für Regionalgeschichte, 1997.
- Schlegel-Matthies, Kirsten. "'Liebe geht durch den Magen': Mahlzeit und Familienglück im Strom der Zeit." In Teuteberg, *Revolution am Esstisch*, 148-161.
- . "Zum Wandel der Esskultur in Deutschland." In Katalyse e. V. and Buntstift e. V., *Ernährungskultur im Wandel der Zeiten*, 11-18.
- Schleiermacher, Sabine. "Die Frau als Hausärztin und Mutter. Das Frauenbild in der Gesundheitsaufklärung." In Roeßiger and Merk, *Hauptsache Gesund!*, 48-58.
- Schlich, Thomas. "The Word of God and the Word of Science: Nutrition Science and the Jewish Dietary Laws in Germany, 1820-1920." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 97-128.
- Schmidt, Ulf. "Sozialhygienische Filme und Propaganda in der Weimarer Republik." In *Gesundheitskommunikation*, edited by Dietmar Jazbinsek, 53-81. Wiesbaden: Westdeutscher Verlag, 2000.
- Schmitz-Berning, Cornelia. *Vokabular des Nationalsozialismus*. New York: Walter de Gruyter, 1998.
- Schnalke, Thomas. *Diseases in Wax: The History of the Medical Moulage*. Translated by Kathy Spatschek. Carol Stream, IL: Quintessence Pub. Co, 1995.
- Schouten, Steven. "Fighting a Kosher War: German Jews and Kashrut in the First World War." In Zweiniger-Bargielowska, Duffett, and Drouard, *Food and War in Twentieth-Century Europe*, 41-55.
- Schröder, Wolfgang. "Saxony's 'Liberal Era' and the Rise of the Red Specter in the 1870s." In Retallack, *Saxony in German History*, 322-335.
- Schrön, Johanna. "Ein 'grosses, lebendiges Lehrbuch der Hygiene'—Die Internationale Hygiene-Ausstellung in Dresden 1911." In Kretschmann, *Wissenspopularisierung*, 309-322.
- Schulte, Sabine. "Das Deutsche Hygiene-Museum in Dresden von Wilhelm Kreis: Biographie eines Museums der Weimarer Republik." Dissertation, Rheinischen Friedrich-Wilhelms-University in Bonn, 2001.
- Schumann, Dirk. *Political Violence in the Weimar Republic, 1918-1933: Fight for the Streets and Fear of Civil War*. New York: Berghahn Books, 2009.
- Shapin, Steven. "The Long History of Dietetics: Thinking about Food, the Self, and Knowledge." Keynote delivered at the annual meeting of the Deutsche Gesellschaft für Geschichte der Medizin, Naturwissenschaft und Technik, Maastricht, Netherlands, 24-26 September 2010.
- . "The Philosopher and the Chicken: On the Dietetics of Disembodied Knowledge." In *Science Incarnate: Historical Embodiments of Natural Knowledge*, edited by Christopher Lawrence and Steven Shapin, 21-50. Chicago: University of Chicago Press, 1998.
- Shapiro, Laura. *Perfection Salad: Women and Cooking at the Turn of the Century*. New York: North Point Press of Farrar, Straus and Girard, 1986.
- Sharma, Avi. "The Anti-Politics of Health: Consensus and Conflict in the German Natural Healing Movement, 1890-1910." *Circumscribere* 10 (2011): 66-78.
- . "Bodies of Concern: Alternative Medicine and the Secret History of German Modernity, 1799-1921." Dissertation, University of Chicago, 2009.

- . "Medicine from the Margins? *Naturheilkunde* from Medical Heterodoxy to the University of Berlin, 1889–1920." *Social History of Medicine* 24, no. 2 (2011): 334-351.
- . *We Lived for the Body: Natural Medicine and Public Health in Imperial Germany*. DeKalb, IL: NIU Press, forthcoming.
- . "Wilhelmine Nature: Natural Lifestyle and Practical Politics in the German Life-Reform Movement (1890-1914)." *Social History* 37, no. 1 (February 2012): 36-54.
- Shorter, Edward. "Private Clinics in Central Europe, 1850-1933." *Social History of Medicine* 3, no. 2 (1990): 159-195.
- Sierck, Bettina. "Wegweiser zum häuslichen Glück für Mädchen." In Framke, *Man nehme*, 357-382.
- Sigerist, Henry E. "The History of Dietetics. 1941." *Gesnerus* 46, no. 3-4 (1989): 249-256.
- Sinding, Christiane. "Making the Unit of Insulin: Standards, Clinical Work, and Industry, 1920-1925." *Bulletin of the History of Medicine* 76, no. 2 (2002): 231-217.
- Smith, David, and Malcolm Nicolson. "Nutrition, Education, Ignorance and Income: A Twentieth-Century Debate." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 288-318.
- Smith, Neil. "Contours of a Spatialized Politics: Homeless Vehicles and the Production of Geographical Scale." *Social Text* no. 33 (1992): 54-81.
- Spiekermann, Uwe. "Brown Bread for Victory: German and British Wholemeal Politics in the Inter-War Period." In Trentmann and Just, *Food and Conflict*, 143-171.
- . "Die Genese der modernen Ernährung in der Wissens- und Konsumgesellschaft Deutschlands 1880-2000." Habilitationsschrift, University of Göttingen, 2008.
- . *Künstliche Kost. Die Genese der modernen Ernährung in der Wissens- und Konsumgesellschaft Deutschland 1880-2000*. Göttingen: University of Göttingen, forthcoming.
- . "Redefining Food: the Standardization of Products and Production in Europe and the United States, 1880-1914." *History and Technology* 27, no. 1, Special Issue: Food, Technology, and Trust (March 2011): 11-36.
- . "Science, Fruits, and Vegetables: A Case Study on the Interaction of Knowledge and Consumption in Nineteenth- and Twentieth-Century Germany." In *Decoding Modern Consumer Societies*, edited by Hartmut Berghoff and Uwe Spiekermann, 229-248. New York: Palgrave Macmillan, 2012.
- . "Twentieth-Century Product Innovations in the German Food Industry." *Business History Review* 83, no. 2 (2009): 291-315.
- . "Vollkorn für die Führer: zur Geschichte der Vollkorn-Brotspolitik im Dritten Reich." *Zeitschrift für Sozialgeschichte des 20. und 21. Jahrhunderts* 16, no. 1 (January 2001): 91-128.
- . "Zeitensprünge: Lebensmittelkonservierung zwischen Haushalt und Industrie 1880-1940." In Katalyse e.V. and Buntstift e.V., *Ernährungskultur im Wandel der Zeiten*, 30-42.
- Spoerer, Mark, and Jochen Streb. "Guns and Butter—But No Margarine: The Impact of Nazi Agricultural and Consumption Policies on German Food Production and Consumption, 1933-38." Paper prepared for the IV International Economic History Congress, Helsinki, Finland, 21-25 August 2006.
- Stage, Sarah, and Virginia B. Vincenti, eds. *Rethinking Home Economics: Women and the History of a Profession*. Ithaca: Cornell University Press, 1997.

- Stein, Claudia. "Geschichte ausstellen: Die historische Abteilung und ethnologische Unterabteilung der Internationalen Hygiene Ausstellung in Dresden 1911?" Paper presented at University of Bielefeld, 15 January 2013.
- Stein, Hartwig. *Inseln im Häusermeer: eine Kulturgeschichte des deutschen Kleingartenwesens bis zum Ende des Zweiten Weltkriegs. Reichsweite Tendenzen und Groß-Hamburger Entwicklung*. 2. Auflage. Frankfurt am Main: Peter Lang, 2000.
- Steinmetz, George. *Regulating the Social: The Welfare State and Local Politics in Imperial Germany*. Princeton: Princeton University Press, 1993.
- Steller, Thomas. "'Eine Hochschule für Jedermann!'"—Die Bedeutung des Deutschen Hygiene-Museums als Akteur nationaler und internationaler Wissenspopularisierung im Zeitraum 1900-1935." Dissertation, University of Bielefeld, in progress.
- . "The Public Body: Collections and Exhibitions of the German Hygiene Museum in Europe in the 1920s." Paper presented at the Public Hygiene in Central and Eastern Europe, 1800-1940 conference at University of Gießen, 13-14 January 2012.
- Stollberg, Gunnar. "Die Naturheilvereine im Deutschen Kaiserreich." *Archiv für Sozialgeschichte* 28 (1988): 287-305.
- Süss, Winfried. *Der "Volkskörper" im Krieg: Gesundheitspolitik, Gesundheitsverhältnisse und Krankenmord im nationalsozialistischen Deutschland 1939-1945*. München: R. Oldenbourg, 2003.
- Suval, Stanley. *Electoral Politics in Wilhelmine Germany*. Chapel Hill, NC: University of North Carolina Press, 1985.
- Szejnmann, Claus-Christian W. "The Development of Nazism in the Landscape of Socialism and Nationalism: The Case of Saxony, 1918-1933." In Retallack, *Saxony in German History*, 356-372.
- Tanner, Jakob. "Der Mensch ist, was er isst: Ernährungsmythen und Wandel des Esskultur." In Katalyse e. V. and Buntstift e. V., *Ernährungskultur im Wandel der Zeiten*, 44-50.
- . *Fabrikmahlzeit: Ernährungswissenschaft, Industriearbeit und Volksernährung in der Schweiz 1890-1950*. Zürich: Chronos, 1999.
- Teich, Mikuláš. "Science and Food during the Great War: Britain and Germany." In Kamminga and Cunningham, *The Science and Culture of Nutrition*, 213-234.
- Teuteberg, Hans Jürgen. "Food Provisioning on the German Home Front, 1914-1918." In Zweiniger-Bargielowska, Duffett, and Drouard, *Food and War in Twentieth-Century Europe*, 59-72.
- , ed. *European Food History: A Research Review*. New York: Leicester University Press/St. Martin's Press, 1992.
- , ed. *Die Revolution am Esstisch. Neue Studien zur Nahrungskultur im 19./20. Jahrhundert*. Stuttgart: Franz Steiner, 2004.
- . "Urbanization and Nutrition: Historical Research Reconsidered." In Atkins, Lummel, and Oddy, *Food and the City in Europe since 1800*, 13-24.
- Teuteberg, Hans Jürgen, with Karl-Peter Ellerbrock, Uwe Spiekermann, Ulrike Thomas, and Angela Zatsch. *Die Rolle des Fleischextrakts für die Ernährungswissenschaften und den Aufstieg der Suppenindustrie. Kleine Geschichte der Fleischbrühe*. Stuttgart: Franz Steiner, 1990.
- Teuteberg, Hans Jürgen, and Günter Wiegelmann. *Unsere tägliche Kost: Geschichte und regionale Prägung*. Münster: F. Coppenrath, 1986.

- . *Der Wandel der Nahrungsgewohnheiten unter dem Einfluss der Industrialisierung*. Göttingen: Vandenhoeck und Ruprecht, 1972.
- Thomann, Klaus-Dieter. "Wissenschaftliche Sozialhygiene und gesellschaftliche Praxis im Deutschen Reich: Ein Beitrag zur Entwicklung der Sozialhygiene im ersten Drittel des 20. Jahrhunderts." *Sudhoffs Archiv* 68, no. 1 (1984): 61-76.
- Thoms, Ulrike. *Anstaltskost im Rationalisierungsprozess: Die Ernährung in Krankenhäuser und Gefängnissen im 18. und 19. Jahrhundert*. Stuttgart: Franz Steiner, 2005.
- . "Between Medical Ideals and Financial Restraints. Standards of German Hospital Food in the 19th and Early 20th Centuries." In Fenton, *Order and Disorder*, 281-295.
- . "Diätetische Kochbüche." In Framke, *Man nehme*, 269-286.
- . "Essen in der Arbeitswelt. Das betriebliche Kantinenwesen seit seiner Entstehung um 1850." In Teuteberg, *Revolution am Esstisch*, 203-218.
- . "The Innovative Power of War: The Army, Food Sciences, and the Food Industry in Germany in the Twentieth Century." In Zweiniger-Bargielowska, Duffett, and Drouard, *Food and War in Twentieth-Century Europe*, 247-262.
- . "Kochbücher und Haushaltslehren als ernährungshistorische Quellen. Möglichkeiten und Grenzen eines methodischen Zugriffs." In *Neue Wege zur Ernährungs-Geschichte: Kochbücher, Haushaltsrechnungen, Konsumvereinsberichte und Autobiographien in der Diskussion*, edited by Dirk Reinhardt, Uwe Spiekermann, and Ulrike Thoms, 9-50. New York: Peter Lang, 1993.
- . "Krankenhauskost zwischen ärztlicher Therapie und administrativer Sparpolitik." In Teuteberg, *Revolution am Esstisch*, 219-231.
- . "Die Kur aus der Küche. Krankenernährung im 19. Jahrhundert." *WerkstattGeschichte* 31 (May 2002): 26-49.
- . "Vegetarianism, Meat and Life Reform in Early Twentieth-Century Germany and their Fate in the 'Third Reich.'" In Cantor, Bonah, and Dörries, *Meat, Medicine, and Human Health in the Twentieth Century*, 145-157.
- . "Zwischen Kochtopf und Krankenbett. Diätassistentinnen in Deutschland 1890-1980." *Medizin in Geschichte und Gesellschaft* 23 (2004): 133-163.
- Timm, Willy. "Henriette Davidis (1801-1876)." *Westfälische Lebensbilder* 12 (1979): 88-103.
- Timmermann, Carsten. "Constitutional Medicine, Neuromanticism and the Politics of Antimechanism in Interwar Germany." *Bulletin of the History of Medicine* 75, no. 4 (2001): 717-740.
- . "Rationalizing 'Folk Medicine' in Interwar Germany: Faith, Business, and Science at 'Dr. Madaus & Co.'" *Social History of Medicine* 14, no. 3 (2001): 459-483.
- . "Wer darf heilen und wer nicht? 'Kurpfuscherei' und die Krise der Medizin in der Weimarer Republik." In *Lügen und Betrügen: Das Falsche in der Geschichte von der Antike bis zur Moderne*, edited by Oliver Hochadel and Ursula Kocher, 134-149. Cologne: Böhlau, 2000.
- Todes, Daniel P. *Pavlov's Physiology Factory: Experiment, Interpretation, Laboratory Enterprise*. Baltimore: Johns Hopkins University Press, 2002.
- Tomes, Nancy. *The Gospel of Germs: Men, Women, and the Microbe in American Life*. Cambridge: Harvard University Press, 1998.
- Treitl, Corinna. "Max Rubner and the Biopolitics of Rational Nutrition." *Central European History* 41, no. 1 (March 2008): 1-25.
- . "Nature and the Nazi Diet." *Food and Foodways* 17 (2009): 138-158.

- Trentmann, Frank, and Flemming Just, eds. *Food and Conflict in the Age of the Two World Wars*. New York: Palgrave Macmillan, 2006.
- Triebel, Armin. "Variations in Patterns of Consumption in Germany in the period of the First World War." In Wall and Winter, *Upheaval of War*, 159-196.
- Usborne, Cornelia. *Cultures of Abortion in Weimar Germany*. New York: Berghahn Books, 2007.
- . *The Politics of the Body in Weimar Germany: Women's Reproductive Rights and Duties*. Ann Arbor: University of Michigan Press, 1992.
- . "Women Doctors and Gender Identity in Weimar Germany (1918-1933)." In *Women and Modern Medical Education*, edited by Lawrence Conrad and Anne Hardy, 109-126. New York: Rodopi, 2001.
- Verdicchio, Dirk. "Vom Außen ins Inneren (und wieder zurück) Medialisierung von Wissenschaft in Filmen über den Körper." *Historische Anthropologie* 16, no. 1 (2008): 55-73.
- Verhey, Jeffrey. *The Spirit of 1914: Militarism, Myth, and Mobilization in Germany*. Cambridge: Cambridge University Press, 2000.
- Vincent, C. Paul. *The Politics of Hunger: The Allied Blockade of Germany, 1915-1919*. Athens, OH: Ohio University Press, 1985.
- Vogel, Klaus. *Das Deutsche Hygiene-Museum Dresden 1911-1990*. Dresden: Stiftung Deutsches Hygiene-Museum, 2003.
- . "The Transparent Man—Some Comments on the History of a Symbol." In *Manifesting Medicine: Bodies and Machines*, edited by Robert Bud, Bernard Finn, and Helmuth Trischler, 31-62. Amsterdam: Harwood Academic, 1999.
- Vossen, Johannes. *Gesundheitsämter im Nationalsozialismus: Rassenhygiene und offene Gesundheitsfürsorge in Westfalen 1900-1950*. Essen: Klartext, 2001.
- Wailoo, Keith. "Sovereignty and Science: Revisiting the Role of Science in the Construction and Erosion of Medical Dominance." *Journal of Health Politics, Policy and Law* 29, no. 4-5 (August-October 2004): 643-659.
- Walkenhorst, Peter. *Nation-Volk-Rasse: Radikaler Nationalismus im Deutschen Kaiserreich 1890-1914*. Göttingen: Vandenhoeck & Ruprecht, 2007.
- Wall, Richard, and J. M. Winter, eds. *The Upheaval of War: Family, Work, and Welfare in Europe, 1914-1918*. New York: Cambridge University Press, 1988.
- Webb, Samantha. "Wordsworth, Count Rumford, and Poverty Relief." *Wordsworth Circle* 43, no. 1 (Winter 2012): 29-35.
- Weindling, Paul. *Health, Race, and German Politics between National Unification and Nazism, 1870-1945*. Cambridge: Cambridge University Press, 1989.
- . "The Medical Profession, Social Hygiene and the Birth Rate in Germany, 1914-18." In Wall and Winter, *Upheaval of War*, 417-438.
- . "Public Health in Germany." In *Health, Civilization, and the State: A History of Public Health from Ancient to Modern Times*, edited by Dorothy Porter, 119-131. London: Routledge, 1999.
- . "Theories of the Cell State in Imperial Germany." In *Biology, Medicine and Society, 1840-1940*, edited by Charles Webster, 99-155. New York: Cambridge University Press, 1981.
- Weinreb, Alice. "For the Hungry Have no Past nor do They Belong to a Political Party: Debates over German Hunger after World War II." *Central European History* 44, no. 1 (March 2012): 50-78.

- Whalen, Robert Weldon. *Bitter Wounds: German Victims of the Great War, 1914-39*. Ithaca: Cornell University Press, 1984.
- Whorton, James C. *Inner Hygiene: Constipation and the Pursuit of Health in Modern Society*. New York: Oxford University Press, 2000.
- Wiedemann, Inga. *Herrin im Hause. Durch Koch- und Haushaltsbücher zur bürgerlichen Hausfrau*. Pfaffenweiler: Centaurus, 1993.
- Wildenthal, Laura. *German Women for Empire, 1844–1945*. Durham: Duke University Press, 2001.
- Wilke, Kerstin. “‘Die deutsche Banane.’ Wirtschafts- und Kulturgeschichte der Banane im Deutschen Reich, 1900-1939.” Dissertation, University of Hannover, 2004.
- Wilz, Annemarie. “Allgemeine Kochbücher.” In Framke, *Man nehme*, 87-240.
- . “»Für Geist und Gemüth« Lexika im Bestand des Deutschen Kochbuch-museums.” In Framke, *Man nehme*, 11-25.
- . “Haushaltsratgeber.” In Framke, *Man nehme*, 27-86.
- Winter, Jay. “Surviving the War: Life Expectation, Illness, and Mortality Rates in Paris, London, and Berlin, 1914-1919.” In Winter and Robert, *Capital Cities at War*, 487-524.
- Winter, Jay, and Jean-Louis Robert, eds. *Capital Cities at War: Paris, London, Berlin 1914-1919*. Vol. 1: [A Social History]. New York: Cambridge University Press, 1997.
- Winter, Jay, and Jean-Louis Robert, eds. *Capital Cities at War: Paris, London, Berlin 1914-1919*. Vol. 2: A Cultural History. New York: Cambridge University Press, 2007.
- Zweiniger-Bargielowska, Ina, Rachel Duffett, and Alain Drouard, eds. *Food and War in Twentieth-Century Europe*. Farnham, Eng.: Ashgate, 2011.